United States Department of the Interior

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In Reply Refer To:
AESO/SE
22410-2009-F-0018

August 6, 2012

Mr. Neil Bosworth, Forest Supervisor
Tonto National Forest
2324 East McDowell Road
Phoenix, Arizona 85006

RE: Treatment of Noxious or Invasive Plants on the Tonto National Forest

Dear Mr. Bosworth:

Thank you for your request for formal consultation and conference with the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Your request was received in our office on April 2, 2010. This consultation will address impacts that may result from the proposed "Treatment of Noxious or Invasive Plants on the Tonto National Forest (TNF)." This project is proposed to occur on portions of the Cave Creek, Globe, Mesa, Payson, Pleasant Valley, and Tonto Basin Ranger districts in central Arizona.

The proposed project "may adversely affect" the southwestern willow flycatcher (flycatcher) (*Empidonax traillii extimus*) and its designated and proposed critical habitat. You also concluded that the project "may adversely affect" Arizona cliffrose (cliffrose) (*Purshia subintegra*) and Arizona hedgehog cactus (hedgehog) (*Echinocereus triglochidiatus* var. *arizonicus*).

We concur with your determinations that the proposed project "may affect, but is not likely to adversely affect," the following species listed as endangered: lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae),* woundfin (*Plagopteris argentissimus*), desert pupfish (*Cyprinodon macularius macularius*), Gila topminnow (*Poecilipoesis occidentalis occidentalis*), Yuma clapper rail (*Rallus longirostris yumanensis*); and razorback sucker (*Xyrauchen texanus*), and Gila chub (*Gila intermedia*) and their designated critical habitat. The concurrences for these species can be found at the end of this biological opinion (Appendix A).

On February 23, 2012, both the spikedace (*Meda fulgida*) and loach minnow (*Tiaroga cobitis*) were uplisted from threatened to endangered and a revised critical habitat designation was finalized. You determined that the project "may affect, but would not likely to adversely affect" these fishes, and that the project would not adversely affect critical habitat. Our concurrence is provided in Appendix A.

We also concur with your determinations that the proposed project "may affect, but is not likely to adversely affect" the following species listed as threatened: Chiricahua leopard frog (*Lithobates chiricahuensis*) and the Mexican spotted owl (MSO) (*Strix occidentalis lucida*) and their designated critical habitat.

You also concluded that the proposed action "is not likely to jeopardize" the continued existence of the experimental non-essential population of the Colorado pikeminnow (*Ptychocheilus lucius*) (Appendix A).

Nationwide, the bald eagle (*Haliaeetus leucocephalus*) was removed from the Federal List of Threatened and Endangered Species on July 9, 2007, and is primarily protected under The Bald and Golden Eagle Protection Act (Eagle Act). As of September 30, 2010, the Federal Court dissolved the injunction that had led to the bald eagle in the Sonoran Desert Area of central Arizona to being returned to the list of Threatened and Endangered Species from 2008 to 2010. Therefore nationwide (including the State of Arizona), the bald eagle is no longer on the Endangered Species list. You provided conservation measures and asked for our technical assistance, which we provide at the end of this document in Appendix B.

This Biological Opinion (BO) is based on information provided in the January 4, 2012, Biological Assessment (BA) and other sources of information and communication between our offices. Literature cited in this BO is not a complete bibliography of all literature available on the species of concern or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at this office.

Consultation history

September 22, 2008:	TNF requests concurrence that the proposed action is "not likely to adversely affect" all federally listed species and critical habitat.
October 22, 2008:	FWS requests extension to conduct review.
October 27, 2008:	TNF grants 60 day extension.
January 14, 2009:	FWS did not concur with determinations and requests more information about the project proposal, methods, species locations, etc.
March 24, 2009:	FWS and TNF meet to discuss proposal.
March 26, 2009:	FWS sends electronic message to TNF summarizing the meeting.
April 2, 2010:	FWS receives Biological Assessment and the TNF's request for formal consultation.
August 17, 2010:	FWS requests extension to complete Biological Opinion.
August 29, 2010:	TNF clarifies proposed action for: 1) the buffer size in MSO habitat when using the herbicide compound dicamba; 2) use of torching techniques in

	hedgehog and cliffrose habitat; 3) implementation of conservation measures in flycatcher habitat when treating salt cedar (tamarisk), and 4) application of techniques in and around spikedace and loach minnow habitat.
November 20, 2010:	TNF provides further clarifications on proposed action for review.
August 15, 2011:	FWS publishes revised southwestern willow flycatcher critical habitat proposal.
August 29, 2011:	TNF and FWS meet to discuss draft Biological Assessment.
February 15, 2012:	FWS receives Biological Assessment.
February 23, 2012:	FWS publishes final rule uplisting spikedace and loach minnow to endangered status with a new critical habitat designation.
March 8, 2012:	FWS sends 30-day letter to TNF acknowledging receipt of the Biological Assessment and beginning of consultation.
March 20, 2012:	FWS publishes final rule designating critical habitat for the Chiricahua leopard frog.
April 16, 2012:	FWS seeks clarification of proposal as a result of the changes in the distribution of the flycatcher and the proposed critical habitat designation.
May-June, 2012:	TNF clarifies a number of details associated with salt cedar and herbicidal treatments, including items such as treatment locations on Tonto Creek, applications near Arizona hedgehog cactus, etc.
June 27, 2012:	FWS submits draft biological opinion to TNF.
July 16, 2012:	TNF provides comments to FWS.

DESCRIPTION OF THE PROPOSED ACTION

The TNF proposes eradication, containment, and/or control of noxious weed and invasive plant species on parts of the Cave Creek, Globe, Mesa, Payson, Pleasant Valley, and Tonto Basin Ranger Districts (Appendix C). Known noxious weeds cover only a small percentage of the TNF, but new occurrences could be found anywhere within the TNF's nearly three million acres. This program will be reviewed and updated after 10 years.

The TNF proposes to implement an integrated vegetation management strategy consisting of two phases: removal and restoration. Noxious weed treatment involves various forms of removal and control methods including the use biological control agents, use of herbicides, and cultural methods such as planting of native species. The removal phase will consist of manual, mechanical, biological (livestock & invertebrate releases), torching, or chemical methods of control, and usually some combination of these methods. The restoration phase will consist of cultural and erosion control actions.

REMOVAL

Manual

Manual plant removal is labor-intensive and involves digging by hand and using hand tools to selectively removing noxious weeds from a native plant population. This is an effective method to quickly control new weeds, but can be ineffective on some types of weeds. This control method will be used on up to 400 acres each year. Examples of manual work include:

- An eight-person crews for a period of five days to remove musk thistle using pick-mattocks and Pulaski.
- Volunteer groups of 15-30 using shovels to grub malta starthistle.

Mechanical

Motorized equipment will be used to cut or clip plants. This method will be used on up to 500 acres each year. Examples of mechanical work include:

- Use of a Stihl FS-450 brush saw to cut thickets of oleander or tree of heaven
- Use of a chainsaw to cut salt cedar outside wilderness areas

Torching

Torching is an inexpensive and often effective method to remove large quantities of seed from annual weeds. As an integral part of multi-year strategy, it can be used in combination with other treatments, especially for annual weeds. Burn projects will be conducted with backpack propane torches and will target specific invasive weed individual plants. Large-scale burns that carry fire will not be used. This control method will be used on up to 1000 acres each year

Many non-native plants respond positively to fire, therefore the following measures are examples of where fire will either not be used for specific plants, or will be used in combinations with other tools:

Table 1. Invasive plant species and anticipated burn response, TNF, AZ.

Invasive plant	**Scientific name**	**Burn response/plan**
Jointed goatgrass	*Aegilops cylindrica*	Burning promotes germination of the following year's crop. A follow-up plan is needed for the year after the burn.
Globe-podded hoary cress, hairy white-top	*Cardaria draba, C. pubescens*	Will not burn.
Knapweeds	*Centaurea diffusa, C. biebersteinii, Acroptilon repens*	Crown re-sprouts and increased seedling germination may eliminate any benefits from burning.
Oleander	*Nerium oleander*	Will not burn due to toxic smoke.
Buffelgrass	*Pennisetum ciliare*	Burning may be a good tool to use in combination with use of herbicides to remove the bulk of decadent growth that could prevent good herbicide contact with growing leaves.
Fountain grass	*Pennisetum setaceum*	Will combine with herbicide.
Mediterranean grass	*Schismus arabicus, S. barbatus*	Will not burn.
Salt cedar	*Tamarix parviflora, T. chinensis, T. ramosissima.*	May burn in some locations, in combination with other treatments, such as foliar herbicide application.

Herbicides

The application of approved chemicals to noxious weeds will be coordinated with treatment efforts undertaken by other Federal, State, and local governments to maximize effectiveness. The amount of treatment would be limited by funding each year, but could occur on up to 9,000 acres per year (less than 0.3% of the National Forest). The majority of treatments will occur along roads and other travel corridors within the TNF. There will be no aerial application of herbicides.

New herbicides and adjuvants with lower ecotoxicity ratings continue to be developed. These compounds may be used in the future, but only after an analysis documents the environmental effects are equal to or less than the chemicals included in this document.

Herbicides will be applied in a variety of ways including:

- Backpack sprayers

- Hand spray applicators
- ATV sprayers
- Trailer/truck-mounted tanks

Table 2. Twelve active ingredients and 11 adjuvants (assists the active ingredient) for possible use on invasive plant species, TNF, AZ.

Name	**Type**	**Examples of brand name**	**Notes**
Aminopyralid	Active Ingredient	Milestone VM	Treats Malta starthistle, globe chamomile, yellow starthistle, scotch thistle, bull thistle, musk thistle, Canada thistle, Vinca, Russian knapweed
Chlorsulfuron	Active Ingredient	Telar, Glean, Corsair	Broadleaf weeds
Clopyralid	Active Ingredient	Transline, Stinger, Reclaim	Broadleaf weeds
Dicamba	Active Ingredient	Banvel, Oracle, Vanquish	Broadleaf weeds, pre-and post-emergent
Glyphosate (aquatic and non-aquatic formulations)	Active Ingredient	Roundup & Razor Pro (non-aquatic), Rodeo (aquatic)	Broad spectrum (both monocots and dicots)
Imazapic	Active Ingredient	Impose, Panoramic, Plateau	Annual & perennial grasses, broadleaf weeds & vines
Imazapyr (aquatic and non-aquatic formulations)	Active Ingredient	Habitat, Arsenal	For riparian & terrestrial vegetation growing in & around surface water
Metsulfuron methyl	Active Ingredient	Escort XP, Manor	Annual & perennial broadleaf weeds & woody plants
Picloram	Active Ingredient	Tordon	Broadleaf weeds, woody plants and vines
Sethoxydim	Active Ingredient	Poast	Annual & perennial grasses
Sulfometuron methyl	Active Ingredient	Oust	Annual and perennial grasses and broadleaf weeds
Triclopyr	Active Ingredient	Garlon, Pathfinder	Woody and herbaceous weeds
Mixture of alkyl polyoxyethylene ether, fatty acids & water	Surfactant	Activator 90	
Alkylaryl alkoxylate, n-	Nonionic	APSA 80	

butyl alcohol	surfactant		
Blend of salts of polylacrylic, hydroxy carboxylic, propionic acids, phosphate ester and ammonium sulfate	Water conditioner	Choice	
Phosphatidylcholine, methylacetic acid & alkyl polyoxyethylene ether	Penetrant, Acidifier, Deposition Aid, Drift Control Agent	LI-700	
Modified Vegetable Oil concentrate	Non-ionic surfactant	MSO	
Unknown (proprietary)	Polymeric Colorant	Blazon Blue	
Unknown (proprietary)	Colorant	Hi-Light	
Alkyl polyglycoside, Ammonium sulfate and Ammonium nitrate	Activator, Penetrant	Magnify	
Alcohol ethoxylate, Phosphatidylcholine and Methylacetic acid	Surfactant, Penetrant, Deposition Aid, Acidifier	Monterrey Super Seven	
Polyether-polymethylpolysiloxane-copolymer, polyether	Surfactant	Silicone Super Wetter	
Silicone polyether copolymer	Surfactant	Slither	

Salt Cedar Treatment

The primary proposed salt cedar treatment area is the Verde River (above and below Horseshoe Lake) and to a lesser degree areas on the Salt River (above Roosevelt Lake) and portion of Tonto Creek (near the Town of Gisela). Additionally, salt cedar treatments will occur at very small sites away from these streams where there are springs, seeps, stock tanks, or runoff from roads and highways.

On large streams such as the Verde or Salt rivers, treatments will be normally be carried out by river rangers with either volunteers or youth corps groups floating down the river, and stopping in areas where salt cedar occur. Trees will be sawn off near ground level and an aquatic-rated herbicide will be immediately applied directly to the cut stump using a hand applicator. An estimated 90 percent of the treatment areas typically consist of salt cedar plants mixed with native vegetation. The other 10 percent are areas with a larger percentage of salt cedars that are one tree wide. An unlimited amount of salt cedar seedlings (plants less than three-feet tall) is planned for removal. An aquatic-rated foliar spray may be used on patches of small seedlings.

<u>Verde River salt cedar treatment</u>

The treatment area is from the TNF, Prescott, and Coconino NF boundary downstream to Ister Flat and from Horseshoe Dam downstream to the Fort McDowell Yavapai Apache Indian Community Boundary (Appendix D). The TNF proposes to treat a maximum of three river miles per year along the Verde River above Ister Flat/Horseshoe Reservoir and up to one mile annually downstream of Horseshoe Reservoir. Estimating an average 100 foot width of vegetation on either side of the river, this could result in treatments of 72.7 acres per year above Ister Flat/Horseshoe Lake and 24 acres per year below Horseshoe Dam. If salt cedar comprises up to 10 percent of this area, this equates to a maximum of 7.3 acres of salt cedar on the upper portions of the Verde River and 2.4 acres on the lower Verde River treated per year.

Salt River salt cedar treatment

The treatment area begins at the Salt River Canyon Wilderness western boundary and continues upstream east along the Salt River to the TNF boundary (Appendix D). Four flycatcher areas (Appendix D) within this stretch of the upper Salt River (Nail Creek, Horseshoe Bend, Redmond Flat, and Gleason Flat) are excluded from the treatment area. No more than 10 acres of salt cedar will be treated annually along the upper Salt River. Dispersed camping spots along the upper Salt River will be the focus of treatments.

Tonto Creek salt cedar treatment

The treatment area begins at downstream end of the Town of Gisela and continues north upstream to Tonto spring (Appendix D). No more than 10 acres along Tonto Creek will be treated, which amounts to no more than an acre of salt cedar treated per year along Tonto Creek.

Table 3. Summary of salt cedar treatment areas, TNF, AZ.

Treatment area	**Acres evaluated for salt cedar treatment**	**Acres of salt cedar treated annually**	**Includes flycatcher proposed and/or designated critical habitat?**
Upper Verde River	72.7*	7.3	Yes*
Lower Verde River	24*	2.4	Yes*
Salt River	10*	1	Yes*
Tonto Creek	10	1	No

*Not all acreage anticipated to be treated in these river segments is designated or proposed as flycatcher critical habitat

Biological Treatment

Biological treatment is the use of grazing animals (sheep, goats, and cattle) and approved insects and pathogens to control weeds when the objective is control and not eradication. The biological agent and the weed co-exist to limit the spread of the weed. Once biological control agents such as insects or plant pathogens are released, they may cover a large number of acres if there is a continuous occurrence of their target weed plant.

Biological control agents include approved insects and pathogens that undergo a rigorous testing procedure prior to being available for release. Initial testing occurs in quarantined laboratories abroad and in the United States. The agents are tested for their effectiveness in controlling the target organism and for their host specificity. Testing includes potential effects on human health, economic crops, rare plants, and similar species found in North America. An agent can be released only after it has been determined that it is unlikely that the agent will feed or cause injury to any native or agronomic species. It generally takes between 10 and 15 years for an agent to be cleared for release.

The Agricultural Plant Health Inspection Service (APHIS) now prepares an Environmental Assessment before release of new agents. This has not always been the case. For any agent that has been released, APHIS has conducted host specificity studies. Upon release of new biocontrol agents, APHIS assumes that these agents will spread throughout North America to wherever the target species exists or will exist in the future.

All insects proposed for release (Table 4) have previously been released in Arizona. The only action the TNF is taking by releasing an insect is changing the location and potentially influencing the rate of spread of the insect.

Table 4. Insects proposed for release on the TNF, AZ.

Scientific name of biocontrol agent	**Common name of biocontrol agent**	**Target species common name**	**Target species scientific name**	**Notes**
Agapeta zoegana	moth	Spotted knapweed	*Centaurea biebersteinii*	First released in the United States in 1984. Has been released in Arizona, California, Colorado, Idaho, Minnesota, Montana, Nebraska, Nevada, North Dakota, Oregon, South Dakota, Utah, Washington, Wisconsin, and Wyoming. The moth has established in these states.
Bangasternus fausti	Flower weevil	Spotted knapweed, diffuse	*Centaurea biebersteinii, Centaurea*	First released in the United States in 1991. The weevil has been released in California, Colorado,

Table 4. Insects proposed for release on the TNF, AZ.				
		knapweed	*diffusa*	Idaho, Minnesota, Montana (established), Nebraska (established), Oregon (established), South Dakota, Washington, and Wyoming. Also released in Arizona.
Bangasternus orientalis	Yellow starthistle bud weevil	Yellow and Malta starthistles	*Centaurea solstitialis, C. melitensis*	Releases were made in California. Washington. Idaho, and Oregon in 1985 and it became established in all states in 1989. Widely distributed in starthistle areas of the western United States, particularly California, Oregon, Washington and Idaho.
Cyphocleonus achates	weevil	Spotted knapweed, diffuse knapweed	*Centaurea biebersteinii, Centaurea diffusa*	First released in the United States in 1987. Has been released in Arizona, California, Colorado, Idaho, Minnesota, Montana, Nebraska, Nevada, Oregon, South Dakota, Utah, Washington, and Wyoming as part of a program to control spotted and diffuse knapweed. Populations are established in Colorado, Montana, and Wyoming, and individuals have been recovered in Oregon. It has also become established in Minnesota.
Eustenopus villosus	Yellow starthistle hairy weevil	Yellow and Malta starthistles	*Centaurea solstitialis, C. melitensis*	Widely distributed in starthistle areas of the western United States, particularly California, Oregon, Washington and Idaho. Introduced on Coconino NF 2008, 2009.
Larinus minutus	weevil	Spotted knapweed, diffuse knapweed	*Centaurea biebersteinii, Centaurea diffusa*	Cleared and first released in the United States in 1991. The weevil has been released in Arizona, California, Colorado, Idaho, Minnesota, Montana (established), Nebraska, Oregon (established), South Dakota, Utah, Washington (established), and Wyoming (established).
Larinus	weevil	Spotted	*Centaurea*	Approved and first released in

Table 4. Insects proposed for release on the TNF, AZ.				
obtusus		knapweed, diffuse knapweed	*biebersteinii, Centaurea diffusa*	1993 in the United States. This weevil has been released in Idaho, Minnesota, Montana (established), Nebraska, Oregon, and Washington. Also released in Arizona.
Mecinus janthinus	Stem-mining weevil	Dalmatian toadflax	*Linaria dalmatica*	Approved for release in the US in 1995. Introduced on Coconino NF in 2008 & 2009.
Sphenoptera jugoslavica	buprestid beetle	Diffuse knapweed	*Centaurea diffusa*	First released in the United States in 1979. Has been released in Arizona, Colorado, Idaho, Montana, Nebraska, Nevada, Oregon, South Dakota, Utah, Washington, and Wyoming. It is established in Colorado, Idaho, Montana, Oregon, South Dakota, Washington, and Wyoming, and is being collected for redistribution in Colorado, Montana, Oregon, and Washington.
Urophora affinis	seed head flies	Spotted knapweed, diffuse knapweed	*Centaurea biebersteinii, Centaurea diffusa*	First released in the United States in 1971. Has been released in Arizona, California, Colorado, Idaho, Michigan, Minnesota, Montana, Nebraska, Nevada, North Dakota, Oregon, South Dakota, Utah, Washington, Wisconsin, and Wyoming. Populations have been established in all of these states but Nevada.
Urophora quadrifasciata	seed head flies	Spotted knapweed, diffuse knapweed	*Centaurea biebersteinii, Centaurea diffusa*	Approved for release in 1988. Has been released and established in Arizona, California, Colorado, Idaho, Michigan, Minnesota, Montana, Nebraska, North Dakota, South Dakota, Utah, Washington, Wisconsin, and Wyoming. Establishment has been confirmed in Indiana, Maryland, New York, Pennsylvania, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, and New Jersey

RESTORATION

Erosion Control

In areas where there are large concentrations of an invasive species and where treatment would result in abundant bare ground, native vegetation will be restored following treatment. Restoration efforts would also involve erosion control (installing silt fence, straw bales, and wattles/fiber rolls) and seeding after wildfire.

Cultural

Seeding with native plants can prevent the occurrence of invasive plants, especially in vulnerable areas of bare ground created by construction activities. Fertilizers or mycorrhizal inoculants will be included in some re-vegetation projects to increase establishment success. This method will be used on up to 2,000 acres each year.

SUMMARY OF TREATMENTS

Type of treatment	**Maximum acres**
Manual (hand tools)	400
Mechanical (motorized equipment)	500
Torching	1,000
Biological control (livestock)	1,000
Biological control (invertebrates)	Maximum release sites: 100 sites/year
Herbicidal	9,000
Cultural	2,000
TOTAL	13,900

CONSERVATION MEASURES

The Recommended Protection Measures for Pesticide Applications (RPMPA) in Region 2 of the Fish and Wildlife Service (White 2007) addresses the conservation of threatened and endangered species, and was the TNF's starting point for developing conservation measures. This document was developed for protecting The Fish and Wildlife Service's trust resources (refuges/hatcheries, migratory birds, and threatened and endangered species). See Appendix 1 and 2 of the BA (USFS 2012) for a summary the RPMPA and adjustments, and where the adjuvants may be used.

1. The TNF will follow all herbicide label requirements.
2. All applications will be under the direction of a Certified Pesticide Applicator.
3. The TNF will apply herbicides only by ground-based equipment, including backpack sprayers, and spray units on ATVs, trucks, etc.
4. The TNF, when any herbicide is applied, will follow all "Best Management Practices" (BMPs) to ensure maximum safety (see below).

5. The TNF will not use clopyralid, dicamba, picloram, and the sulfonylurea herbicides where the water table is within six feet of the surface or where soil permeability is conducive to water contamination.
6. Within designated buffer zones along streams and bodies of water, the TNF will only use glyphosate and amine formulations of triclopyr labeled for aquatic use. Imazapic, imazapyr, and triclopyr may be used in buffer zones as long as they are not directly applied to water.
7. TNF applicators are required to wear appropriate personal protective equipment as required on the label.
8. The TNF will follow all requirements in a Safety and Spill Plan.

General Project Best Management Practices

1. The TNF will implement Integrated Weed BMPs.
2. The TNF will survey threatened and endangered species habitats to determine and prioritize the occupied and potential habitats that would be most vulnerable to encroachment of invasive and noxious weeds.
3. The TNF will use native plants species for seeding and planting during re-vegetation. An exception is the use of sterile hybrid grasses after careful analysis to provide immediate ground cover after wildfires.
4. The TNF will review "weed-free" certifications for seed and mulch to ensure they are "free" of the weed species to be controlled in the action area.
5. The TNF will conduct additional analysis if planned treatments are not within the design features of the proposed action. That analysis may require additional FWS coordination.
6. The TNF will work cooperatively with adjacent landowners to manage noxious and invasive weeds to prevent spread to the TNF.

Herbicide Pre-spray Best Management Practices

1. The TNF will determine the necessity for weed management by scouting the area for weed density.
2. The TNF recognizes the significance of protecting Native American ethno-botany locations, and will coordinate and consult with interested tribes to protect the integrity of sites where native plants may be collected.
3. The TNF will use herbicides only when they will provide the most effective control relative to the cost and potential hazard of other management techniques.
4. The TNF will choose the most effective herbicide that requires the least number of applications.
5. The TNF will choose the lowest effective rate of application.
6. The TNF will scout the area and identify sensitive situations like residential structures, campgrounds that will be used by the public, etc.
7. The TNF will complete a Pesticide Use Proposal (PUP) form prior to the application of any herbicide. Approval of the PUP is required in order to use herbicides on the TNF for any project and includes all the details associated with application (herbicide name, regulations, rate of use, etc.) and conservation measures for federally-listed species found in the BA and BO, and other sensitive species and areas described in the projects National Environmental Policy Act documentation.

8. The TNF plans to leave an appropriate buffer zone around bodies of water, adjacent sensitive areas, and populations of threatened, endangered, or sensitive species. These buffer zones will be marked as needed to guide herbicide applicators.

Herbicide Spraying Best Management Practices

1. The TNF will ensure weather conditions are favorable for application, and will not spray when winds are over 10 miles per hour or during inversions.
2. The TNF will post informational signs at sites scheduled for herbicide application.
3. The TNF will use the lowest pressure, largest droplet size, and largest volume of water permitted by the label to obtain adequate treatment success.
4. The TNF will use the lowest spray boom and release height possible consistent with operator safety.
5. The TNF may use spot applications of triclopyr, glyphosate, imazapic, and imazapyr on the edge of some bodies of water in compliance with label requirements.
6. The TNF will not conduct broadcast applications of glyphosate and other broad spectrum herbicides where threatened, endangered, and sensitive plant species are known to occur.
7. The TNF will mark buffer zones around any populations of threatened, endangered, and sensitive plant species, and undesirable plant control in buffer zones will include spraying with selective herbicides that will not affect threatened, endangered, and sensitive plants, or spot applications of individual weeds with backpack sprayers, daubing, or hand grubbing with no herbicide use.
8. The TNF will require all herbicide applicators to use appropriate personal protective equipment.
9. Only those herbicides labeled for use to the edge of bodies of water or with aquatic labeling shall be used within buffer zones and aquatic situations.

Herbicide Post-Spray Best Management Practices

1. The TNF will monitor treated areas to assess efficacy.
2. The TNF will monitor populations of threatened, endangered, or sensitive species to ensure there were no unanticipated adverse effects.

All Species

1. Where two or more species occur in a treatment area, the more restrictive conservation measures will take priority.
2. Noxious and invasive weed treatment methods during the breeding seasons for birds would be commensurate with designated uses (non-motorized, motorized, livestock, etc.) in the treatment areas.
3. Adjuvants including surfactants would be used or applied according to the adjuvant summary table identified in the BA (USFS 2012).
4. The TNF will submit an annual report of herbicide treatments occurring within listed species habitats to FWS.

Arizona Cliffrose

1. The TNF will not torch weeds where Arizona cliffrose are known to occur. Manual treatments will be used.
2. The TNF will not use livestock grazing as a tool to manage weeds where Arizona cliffrose occur.

Arizona Hedgehog Cactus

1. Prior to the TNF conducting noxious weed control inside or adjacent to Arizona hedgehog cactus habitat, the TNF will conduct a census (100% coverage) of the planned treated area.
2. A 20-foot buffer area marked with flags will be used for herbicidal spot applications and 60-foot buffer area for mechanized herbicidal applications.
3. Manual treatments (pulling weeds, hand tools) will be used in Arizona hedgehog habitat within 20- foot buffer zones.
4. The TNF will not torch weeds where Arizona hedgehog cacti are found.
5. The TNF will not use livestock grazing as a tool to manage weeds where Arizona hedgehog cacti occur.
6. No clopyralid, dicamba, picloram, or tebuthiuron will be used to control weeds where Arizona hedgehog cactus occur due to the risk of adverse affects to plant survival, vigor, and growth.
7. When the TNF conducts noxious weed control, people experienced with Arizona hedgehog cactus identification and life stages will be present to prevent cacti from harm.

Southwestern Willow Flycatcher

1. On Tonto Creek within the TNF, treatment to remove salt cedar will only be conducted from the Town of Gisela, upstream (Appendix D). As a result, no flycatchers or its designated or proposed critical habitat are expected to be affected on Tonto Creek.
2. On the upper Salt River within the TNF (upstream of Roosevelt Lake and the Highway 188 Bridge), specific flycatcher habitat areas will be omitted from salt cedar treatment, including, Nail Creek, Redmond Flat, Horseshoe Bend, and Gleason Flat (Appendix D). Areas of critical habitat in between these sites are included in the salt cedar treatment areas.
3. The TNF will not treat salt cedar within the Habitat Conservation Plan boundaries of Roosevelt Lake (at the Tonto Creek/Salt River confluence) and at Horseshoe Lake (along the Verde River).
4. The TNF treatments of salt cedar in flycatcher critical habitat on the Verde River (upstream from Ister Flat and downstream from Horseshoe Dam) and on the upper Salt River, will occur during the flycatcher non-breeding season from September to March when flycatchers are absent from the area.
5. The TNF could treat salt cedar in and around areas where flycatcher territories may occur or have occurred along the selected portions of the Verde River (upstream of Ister Flat and downstream of Horseshoe Dam), upper Salt River (omitting areas of Nail Creek, Horseshoe Bend, Redmond Flat, and Gleason Flat), and Tonto Creek (upstream from the Town of Gisela).

   Evaluation of habitat and flycatcher specific surveys will help determine the status of the flycatcher in these areas in order to prevent any direct or indirect effects. In order to avoid impacts while treating salt cedar around existing territories, the TNF will not treat within a quarter mile of the average location of detected flycatchers, if the extent of the flycatcher's

territory is unknown. The TNF will not treat salt cedar at any currently occupied flycatcher territory in these select locations, until it has not been known to be used for nesting for three consecutive years. At that time, the TNF may treat salt cedar in these locations.

6. The TNF will not remove salt cedar monocultures greater than 0.25 acre. In all other areas, salt cedar will be treated in areas where the canopy of salt cedar consists of less than 10 percent of the total area within a 50 foot radius circle (NOTE: salt cedar seedlings less than 3 feet tall are not used in this estimation; the TNF will remove unlimited amounts of salt cedar seedlings).

Action Area

The action area is larger than the footprint of the project area and represents all areas to be affected directly or indirectly by the treatment of noxious or invasive plants on the TNF. Effects from the proposed action that extend beyond the project area footprint may also extend to adjacent or nearby non-Federal lands and are included as part of the action area.

Other than invertebrate biocontrol, the extent of the action area for all strategies to treat invasive and noxious weeds (herbicidal, mechanical, etc.) is the TNF boundary. Once released onto the TNF, biocontrol invertebrates have the possibility of moving beyond the TNF boundary 1) on their own; 2) by "hitchhiking" on vehicles, clothes, animals or other objects that can move off of TNF boundaries; or 3) through intentional collection and movement by people. However, it is unknown to what extent these insects will travel and/or persist away from the TNF boundary. These biocontrol insects, as described by the TNF, have been approved for release within the United States of America and the State of Arizona.

STATUS OF THE SPECIES AND CRITICAL HABITAT

Southwestern willow flycatcher

Description

The southwestern willow flycatcher is a small grayish-green passerine bird (Family Tyrannidae) measuring approximately 5.75 inches. The song is a sneezy "fitz-bew" or a "fit-a-bew", the call is a repeated "whit." It is one of four currently recognized willow flycatcher subspecies (Phillips 1948, Unitt 1987, Browning 1993). It 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, Peterson 1990, Ridgely and Tudor 1994, Howell and Webb 1995). The historical breeding range of the southwestern willow flycatcher included southern California, Arizona, New Mexico, western Texas, southwestern Colorado, southern Utah, extreme southern Nevada, and extreme northwestern Mexico (Sonora and Baja) (Unitt 1987).

Listing and critical habitat

The southwestern willow flycatcher was listed as endangered, without critical habitat on February 27, 1995 (USFWS 1995). Critical habitat was later designated on July 22, 1997 (USFWS 1997a). A correction notice was published in the Federal Register on August 20, 1997 to clarify the lateral extent of the designation (USFWS 1997b).

On May 11, 2001, the 10th circuit court of appeals set aside designated critical habitat in those states under the 10th circuit's jurisdiction (New Mexico). The FWS decided to set aside critical habitat designated for the southwestern willow flycatcher in all other states (California and Arizona) until it could re-assess the economic analysis.

On October 19, 2005, the FWS re-designated critical habitat for the southwestern willow flycatcher (USFWS 2005). A total of 737 river miles across southern California, Arizona, New Mexico, southern Nevada, and southern Utah were included in the final designation. The lateral extent of critical habitat includes areas within the 100-year floodplain.

On August 15, 2011, the FWS proposed a revision to the critical habitat designation, identifying stream segments in each of the 29 Management Units where there are recovery goals (USFWS 2011). These segments totaled 2,090 stream miles. Similar to the 2005 rule, the lateral extent of critical habitat includes only the riparian areas within the 100-year floodplain. About 790 stream miles were identified as areas we will consider for exclusion from the final designation under section 4(b)(2) of the Act. The 2005 designation remains in place until the new proposal is finalized towards the end of 2012. Therefore, this consultation, evaluates both the existing and the proposed critical habitat.

A final recovery plan (Plan) for the southwestern willow flycatcher was signed by the FWS Region 2 Director and released to the public in March, 2003 (USFWS 2002). The Plan describes the reasons for endangerment, status of the flycatcher, addresses important recovery actions, includes detailed issue papers on management issues, and provides recovery goals. Recovery is based on reaching numerical and habitat related goals for each specific Management Unit established throughout the subspecies range and establishing long-term conservation plans (USFWS 2002).

Habitat

The southwestern willow flycatcher breeds in dense riparian habitats from sea level in California to approximately 8,500 feet in Arizona and southwestern Colorado. Historical egg/nest collections and species' descriptions throughout its range describe the southwestern willow flycatcher's widespread use of willow (*Salix* spp.) for nesting (Phillips 1948, Phillips *et al.* 1964, Hubbard 1987, Unitt 1987, San Diego Natural History Museum 1995). Currently, southwestern willow flycatchers primarily use Geyer willow (*Salix geyeriana*), coyote willow (*Salix exigua*), Goodding's willow (*Salix gooddingii*), boxelder (*Acer negundo*), salt cedar (*Tamarix* sp.), Russian olive (*Elaeagnus angustifolio*), and live oak (*Quercus agrifolia*) for nesting. Other plant species less commonly used for nesting include: buttonbush (*Cephalanthus* sp.), black twinberry (*Lonicera involucrata*), cottonwood (*Populus* spp.), white alder (*Alnus rhombifolia*), blackberry (*Rubus ursinus*), and stinging nettle (*Urtica* spp.). Based on the diversity of plant species composition and complexity of habitat structure, four basic habitat types can be described for the southwestern willow flycatcher: monotypic willow, monotypic exotic, native broadleaf dominated, and mixed native/exotic (Sogge *et al.* 1997).

The flycatcher's habitat is dynamic and can change rapidly: nesting habitat can grow out of suitability; salt cedar habitat can develop from seeds to suitability in about four to five years; heavy runoff can remove/reduce habitat suitability in a day; or river channels, floodplain width, location, and vegetation density may change over time. The flycatcher's use of habitat in different successional stages may also be dynamic. For example, over-mature or young habitat not suitable for nest placement can be occupied and used for foraging and shelter by migrating, breeding,

dispersing, or non-territorial southwestern willow flycatchers (McLeod *et al.* 2005, Cardinal and Paxton 2005). Flycatcher habitat can quickly change and vary in suitability, location, use, and occupancy over time (Finch and Stoleson 2000).

Salt cedar is an important component of the flycatcher's nesting and foraging habitat in the central part of the flycatcher's breeding range in Arizona, southern Nevada and Utah, and western New Mexico. This is especially true in areas where land and water management actions create landscape conditions favorable to the establishment of salt cedar and/or conditions that do not allow native vegetation to flourish (USFWS 2002). In addition to using areas comprised of all native riparian plant species, flycatchers can also place nests and forage within areas of dense, monotypic stands of salt cedar, areas of mixed native/salt cedar habitat combinations (USFWS 2002). In 2001 in Arizona, 323 of the 404 (80%) known flycatcher nests (in 346 territories) were built in a salt cedar tree (Smith *et al.* 2002). Salt cedar had been believed by some to be a habitat type of lesser quality for the southwestern willow flycatcher, however comparisons of reproductive performance (USFWS 2002), prey populations (Durst 2004) and physiological conditions (Owen and Sogge 2002) of flycatchers breeding in native and exotic vegetation has revealed no difference at breeding sites in central Arizona (Sogge *et al.* 2005).

The introduced tamarisk (salt cedar) leaf beetle was first detected affecting salt cedar within the range of the southwestern willow flycatcher in 2008 along the Virgin River in St. George, Utah. Initially, this insect was not believed to be able to move into or survive within the southwestern United States in the breeding range of the flycatcher. Along this Virgin River site in 2009, 13 of 15 flycatcher nests failed following vegetation defoliation (Paxton *et al.* 2010). As of 2012, the beetle has been found in southern Nevada/Utah and northern Arizona/New Mexico within the flycatcher's breeding range. Because salt cedar is a component of about 50 percent of all known flycatcher territories (Durst *et al.* 2008), continued spread of the beetle has the potential to significantly alter the distribution, abundance, and quality of flycatcher nesting habitat and impact breeding attempts.

Rangewide distribution and abundance

At the end of 2007, there were 288 known southwestern willow flycatcher breeding sites in California, Nevada, Arizona, Utah, New Mexico, and Colorado (all sites from 1993 to 2007 where a territorial flycatcher has been detected) holding an estimated 1,299 territories (Durst *et al.* 2008). It is difficult to arrive at a grand total of flycatcher territories since not all sites are surveyed annually. Numbers have increased since the bird was listed and some habitat remains unsurveyed; however, after nearly a decade of intense surveys, the existing numbers are just past the upper end of Unitt's (1987) estimate of 20 years ago (500-1000 pairs). About 50 percent of the 1,299 estimated territories (Table 5) throughout the subspecies range are located at four general locations (Cliff/Gila Valley – New Mexico, Roosevelt Lake - Arizona, San Pedro River/Gila River confluence – Arizona, and Middle Rio Grande, New Mexico).

Arizona distribution and abundance

While numbers have significantly increased in Arizona (145 to 459 territories from 1996 to 2007) (English *et al.* 2006, Durst *et al.* 2008), overall distribution of flycatchers throughout the state has not changed much. Currently, population stability in Arizona is believed to be largely dependent on the presence of two large populations (Roosevelt Lake and San Pedro/Gila River confluence). Therefore, the result of catastrophic events or losses of significant populations either in size or location could greatly change the status and survival of the bird. Conversely, expansion into new

habitats or discovery of other populations would improve the known stability and status of the flycatcher.

Table 5. Estimated rangewide population for the southwestern willow flycatcher based on 1993 to 2007 survey data for Arizona, California, Colorado, New Mexico, Nevada, Utah, and Texas[1].

State	Number of sites with WIFL territories 1993-07[2]	Percentage of sites with WIFL territories 1993-07	Number of territories[3]	Percentage of total territories
Arizona	124	43.1 %	459	35.3 %
California	96	33.3 %	172	13.2 %
Colorado	11	3.8 %	66	5.1 %
Nevada	13	4.5 %	76	5.9 %
New Mexico	41	14.2 %	519	40.0 %
Utah	3	1.0 %	7	0.5%
Texas	?	?	?	?
Total	288	100 %	1,299	100 %

[1]Durst *et al.* 2008.
[2]Site boundaries are not defined uniformly throughout the bird's range.
[3] Total territory numbers recorded are based upon the most recent years survey information from that site between 1993 and 2007.

Critical habitat

The primary constituent elements of designated critical habitat are based on riparian plant species, structure and quality of habitat and insects for prey. The 2011 proposed critical habitat designation has a nearly identical list of plant and insect features as the primary constituent elements. The 2005 primary constituent elements are:

1. Riparian habitat in a dynamic successional riverine environment (for nesting, foraging, migration, dispersal, and shelter) that comprises:

    a. Trees and shrubs that include, but are not limited to, willow species, box elder, salt cedar, Russian olive, cottonwood, stinging nettle, alder, ash, poison hemlock, blackberry, oak, rose, false indigo, Pacific poison ivy, grape, Virginia creeper, Siberian elm, and walnut.

    b. Dense riparian vegetation with thickets of trees and shrubs ranging in height from 2 to 30 meters (m) (6 to 98 feet (ft.). Lower-stature thickets (2 to 4 meters or 6 to 13 feet tall) are found at higher elevation riparian forests, and tall-stature thickets are found at middle- and lower-elevation riparian forests;

c. 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 level, or as a low, dense tree canopy;

d. Sites for nesting that contain a dense tree and/or shrub canopy (the amount of cover provided by tree and shrub branches measured from the ground) (*i.e.*, a tree or shrub canopy with densities ranging from 50 percent to 100 percent); or

e. Dense patches of riparian forests that are interspersed with small openings of open water or marsh, or shorter/sparser vegetation that creates a mosaic 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).

2. A variety of insect prey populations found within or adjacent to riparian floodplains or moist environments, including: flying ants, wasps, and bees; dragonflies; flies; true bugs; beetles; butterflies/moths and caterpillars; and spittlebugs.

A variety of river features such as broad floodplains, water, saturated soil, hydrologic regimes, elevated groundwater, fine sediments, etc. help develop and maintain these constituent elements (USFWS 2005) and are also listed as the physical and biological features of critical habitat described in the 2011 revision proposal.

Past Consultations and other actions
Since listing in 1995, at least 209 Federal agency actions have undergone (or are currently under) formal section 7 consultation throughout the flycatcher's range. This list of consultation can be found in the administrative record for this consultation. Most recently, we concluded in our biological opinion for the TNF's portion of Southwestern Regional Land Resource Management Plans (LRMP) (USFWS 2012, #2012-F-011) that ongoing grazing on the TNF could adversely affect critical habitat by reducing the occurrence, longevity, and quality of the riparian habitat-based primary constituent elements. Similarly, TNF activities could result in harassment of two flycatcher territories annually. Other recent actions on the TNF (Table 6) have resulted in some adverse affects to critical habitat and incidental take. Since flycatcher critical habitat was finalized in 2005, at least 36 formal opinions have been completed in Arizona (within and outside designated critical habitat). While many opinions were issued for the previous critical habitat designation, the stream reaches and constituent elements have changed.

Activities continue to adversely affect the distribution and extent of all stages of flycatcher habitat throughout its range (development, urbanization, grazing, recreation, habitat removal, dam operations, ground and surface water extraction, etc.). Introduced salt cedar eating leaf beetles were not anticipated to persist within the flycatcher's range. However, they were detected within the breeding habitat (and designated critical habitat) of the flycatcher in 2008 along the Virgin River near the Town of St. George, Utah. In 2009, beetles were also known to have been detected defoliating habitat within the range of flycatcher habitat in southern Nevada, and along the Colorado River in the Grand Canyon and near Shiprock in Arizona. Stochastic events also continue to change the distribution, quality, and extent of flycatcher habitat.

Table 6. Formal Section 7 consultations (2005-2012) with southwestern willow flycatcher on TNF, AZ.

Consultation	**Date**	**Project**	**Level of incidental take**	**Form of incidental take**	**Critical habitat conclusion**
2012-F-0011	4/30/12	Southwestern Regional Land Resource Management Plans: TNF	2 territories annually	Harassment	Adverse affect to critical habitat, no adverse modification
22410-2004-F-0447	7/27/11	Tonto and Oak creek bridge development	None	None	Adverse affect to critical habitat, no adverse modification
22410-2007-F-0218	8/17/09	Ongoing grazing for three allotments	None	None	No adverse affects, no adverse modification
22410-2006-F-	7/17/08	AZ forests utility corridor maintenance, phase 2	None	None	Adverse affect to critical habitat, 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 critical habitat within Horseshoe Lake conservation space, no adverse modification along river
036522410-2006-F-0364	7/5/07	AZ forests utility hazard tree removal, phase 1	All flycatcher nesting within about 5.5 acres of habitat	Harassment	Adverse affect to critical habitat, no adverse modification

Conservation measures associated with some consultations and Habitat Conservation Plans have helped to acquire lands specifically for flycatchers on the San Pedro, Verde, and Gila rivers in AZ and the Kern River in CA. Habitat Conservation Plans have been completed with Salt River Project for the operation of dams affecting TNF managed lands at Roosevelt Lake and at Horseshoe Lake and the Verde River. Additionally, along the Lower Colorado River, the U.S. Bureau of Reclamation is currently attempting to establish riparian vegetation to expand and improve the distribution and abundance of nesting flycatchers. A variety of Tribal Management Plans in CA, AZ, and NM have been established to guide conservation of the flycatchers. Additionally, during the development of the 2005 critical habitat rule, management plans were developed for some private lands along the Owens River in CA and Gila River in NM. These are a portion of the conservation actions that have been established across the subspecies' range.

Arizona hedgehog cactus

The Arizona hedgehog cactus was listed as endangered without critical habitat in 1979 (USFWS 1979). No recovery plan has been established for this cactus. A technical review of a draft Arizona hedgehog cactus conservation plan was drafted in 1984 by the Southwest Region 3 of the Forest Service, but never finalized. Its purpose was to propose reasonable actions which the Forest Service deemed necessary for the recovery of the species. The cactus is also protected by the Arizona Native Plant Law (A.R.S. Chapter 7, Article 1) as a Highly Safeguarded Native Plant and protected from international trade by the Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES).

The Arizona hedgehog cactus (*Echinocereus triglochidiatus* var. *arizonicus*) is a succulent, perennial plant with diploid, perfect-flowers, occurring in a limited area of central Arizona. Distinguishing characteristics of the cactus include its thick stems and smooth spines. The Arizona hedgehog cactus has a dark green cylindroid stem (2.5-12 in, 6.4-30.5 cm). Stems occur singly or in clusters, with one to three gray or pinkish central spines and five to eleven shorter radial spines that are less than 0.5 inches in length (Baker 2006). The most distinguishing feature of this taxon comparing it to other varieties of *E. triglochidiatus* is its robustness; the stems are wider and generally taller (USFWS 1985). The cactus is an obligate out-crosser that is pollinated by hummingbirds, carpenter bees, solitary bees, and honeybees (USFS 2004). It produces bright red flowers along the side of the stem in late April to May, and fruits from May to June (AGFD 1992). About 100 seeds are produced per fruit (AGFD 1992) and mature cacti can produce many fruits per year. Recent morphological work by Baker (2006) recommends that this taxon be placed within *Echinocereus arizonicus (E. arizonicus* ssp. *arizonicus)*, rather than the *Triglochidiatus* section.

The Arizona hedgehog cactus occupies a narrow geographical range within central Arizona in Pinal and Gila counties, and includes the Pinal, Dripping Springs, Superstition, and Mescal Mountains. This cactus can also be found in the highlands between the Towns of Globe and Superior. More specifically, the Arizona Rare Plant Committee (2001) reports its range as the Superstition Mountains and Top of the World on the TNF. However, two small subpopulations occur outside this area, the Apache Peak subpopulation north of the Town of Globe and the El Capitan subpopulation south of Globe. These populations (main and two subpopulations) are "classical" var. *arizonicus* and are the only populations of the Arizona hedgehog cactus subject to the protection and restrictions of the Act. This cactus occurs on the TNF, Arizona State Land Department trust lands, lands administered by the Bureau of Land Management (BLM), and privately-owned lands. Land ownership of the main population area is about 17,500 acres on the

TNF, 550 acres of State trust land, and 825 acres of privately owned land (USFS 1996). Acreage on BLM lands is unknown.

The distribution of the Arizona hedgehog cactus occurs within the ecotone between Madrean Evergreen Woodland and Interior Chaparral at elevations ranging from 3,300 to 5,700 feet. Preferred habitat for this cactus is exposed and stable bedrock or boulders exhibiting sufficient fracturing or rock interstices for establishment. Parent rock materials of preferred habitat are Schultze granite and Apache Leap tuff (dacite), both igneous in origin (USFS 1996, AGFD 2003). Pinal schist and the Pioneer formation in proximity to the dacite and Schultze granite also provide habitat for the cactus, but only where these formations are exposed bedrock (USFS 1996). The majority of Arizona hedgehog cacti are found scattered on open, rocky slopes of 20 to 90 degrees, and steep, fissured cliffs (Philips *et al.* 1979, USFWS 1985). Its roots invade cracks, fissures, or interstices within exposed rock or narrow pockets between boulders where the microclimate provides the necessary periodic moisture, moist soils, and shelter from high temperatures (USFS 1996). The cactus may be found on flatter ground and more open slopes as well as, in the understory of shrubs, but moderate to high shrub densities and associated deeper soils tend to preclude the cactus (USFS 1996).

No range-wide surveys have been conducted for the Arizona hedgehog cactus. As of 2011, there were at least 1,531 documented plants (see below). Direct access to a large portion of the species range is very limited due to the rugged topography and remoteness of its habitat. As a consequence, reliable estimates on abundance counts are limited. In addition, this variety can be difficult to distinguish from other varieties such as *Echinocereus santaritensis*. Current taxonomic work will aid in better identification of Arizona hedgehog cactus populations, particularly those occurring on the fringes of its range. Information and population trend status for the species are primarily reported by projects requiring section 7 consultation.

Surveys conducted for the Arizona hedgehog cactus between 1992 and 2000 located approximately 1,272 plants near the OMYA Inc. limestone quarry and Carlota Copper Mine, both located north of US60 on the Tonto National Forest (USFS 1996, SWCA, Inc. 1999). Using all available distribution and ecological data at the time, Cedar Creek Associates estimated that the cactus occupied approximately 18,900 acres (30 square miles) of habitat within the main population (USFS 1996). The estimated main population, according to Steve Viert of Cedar Creek, is about 257,500 cacti. He derived this estimate through survey efforts and statistical analysis using known geologic preferences of the plant. However, given the difficulties in properly identifying variety *arizonicus* this estimate may be overstated.

According to the Arizona Heritage Management Database, there are 28 records documenting the location and/or number of approximately 1,302 cacti observed between 1922 and 2009 (Schwartz, S., AGFD, pers. comm.). Some of these records are anecdotal and, for older records, the genetics of the individual should be verified for the variety *arizonicus*. Since 2009, there have been additional surveys or discoveries of the Arizona hedgehog cactus. In 2010, FWS completed a section 7 consultation on the TNF's approval of the prefeasibility Activities Plan of Operations for the proposed Resolution Copper project. This consultation and project contributed to more recent findings of the cactus due to project related survey efforts conducted between 2001 and 2011. Surveys of Arizona hedgehog cactus conducted by WestLand Resources, Inc., (2009, 2011) in conjunction with the Resolution Cooper project in 2004, located a total of 149 Arizona hedgehog cacti growing near the Oak Flat Campground and east to the Top of the World on both side of US

60. Densities of this cactus species during the survey were reported to be one plant per 336 acres. It was noted that the density in this area was far less than the densities found for Carlota Copper Mine of 2 to 20 plants per acre.

In 2011, 15 Arizona hedgehog cacti were observed along the lower slopes of Devils Canyon with estimates of 25 to 30 plants in the vicinity (Taylor, M., USFS, pers. comm.). Recently, two populations consisting of approximately 60 Arizona hedgehog cacti were documented within the headwaters of Haunted Canyon and farther east in the Superstition Wilderness area (Tonn, S. AGFD, pers. comm.). These cacti were verified as variety *arizonicus* through chromosome analysis. The distribution of these populations has not been fully documented.

Threats to the Arizona hedgehog cactus include habitat destruction and fragmentation by mining, mineral exploration, road construction, power-line construction and utility corridors, off-highway vehicle use and other recreational activities, rangeland improvements including water developments, trampling by livestock, and illegal collecting. Additional threats to the cactus include wildfire, herbicide and pesticide application, and insect infestation (Philips *et al*. 1979; AGFD 1992; USFS 1996).

Since 1990, nine formal section 7 consultations have been conducted for the Arizona hedgehog cactus. Previous projects have resulted in the direct impact or loss of an estimated 3,247 individuals and approximately 561.41 acres of occupied, suitable, and potential habitat. In 1996, a Conservation Assessment and Plan was finalized for the cactus on the TNF (Carlota Mine 22410-1992-F-419). The main recommendations of this plan were the identification of "safe areas", logical ecological units within the distributional limits of the taxon where the Federal government has options to maintain relatively strict control over land uses with management emphasis toward the perpetuation of the species (USFS 1996).

Arizona cliffrose

Arizona cliffrose was listed as endangered under the Act on May 29, 1984 (USDI 1984). Critical habitat has not been designated. The Arizona Cliffrose Recovery Plan was completed in 1995 (USFWS 1995).

Arizona cliffrose is a long-lived, xerophytic, edaphic endemic woody perennial in the family *Rosaceae*. Plants are of low stature and open growth form compared with its congener Stansbury cliffrose (*P. stansburiana*). Flowers have both stamens and carpels (perfect) and pollination can occur on any of the first three days after the flower is completely open (anthesis). Other life history traits, such as age at first reproduction, gross and net reproductive rates, and longevity, are unknown (USFWS 1995).

Arizona cliffrose generally flowers from late March through early May and is visited by a wide variety of insects, including lepidopterans, dipterans, and bees. Typically hundreds of flowers are produced on each mature plant, which can reproduce for many years (USFWS 1995). Flower and seed production varies between years based on climatic conditions, plant vigor, browsing, and other factors. Native and introduced honeybees (*Apis mellifera*) are the most important pollinators, the latter becoming the predominant pollinator later in the flowering season (Fitts *et al.* 1993).

Arizona cliffrose fruit dispersal occurs when summer rains dislodge seeds from plants (USFWS 1995). Experiments have shown that this species is partially self-compatible, but sets significantly more seeds and produces fruit more often when outcrossed (Fitts *et al.* 1993).

This species has narrow habitat requirements and occurs at four widely separated areas in central Arizona near the following landmarks: the Town of Bylas (Graham County), Horseshoe Lake (Maricopa County), Burro Creek (Mohave County), and the Town of Cottonwood in the Verde Valley (Yavapai County) (Rutman 1992). These sites differ slightly in elevation and associated vegetation, but all sites have limestone soils (generally white but also reddish in color) derived from Tertiary lacustrine (lakebed) deposits, and at each site Arizona cliffrose is part of a locally unique vegetative community (Anderson 1993).

The geographic and local distribution of Arizona cliffrose appears to be limited by competition from other plant species rather than a requirement for a specific soil type. These soils are relatively infertile and have significantly lower amounts of phosphorus and organic matter compared with surrounding areas where Arizona cliffrose is absent (Anderson 1986, Anderson 1993). These surrounding areas are typically dominated by creosotebush (*Larrea tridentata*), which is thought to have a competitive advantage over Arizona cliffrose due to its aggressive seedling establishment (Anderson 1993). Creosotebush is unable to grow on the relatively infertile lacustrine soils. However, it has been found growing together with Arizona cliffrose in the Verde Valley, in areas with higher amounts or organic matter and phosphorus. This suggests that the distribution of Arizona cliffrose is limited primarily by competition from creosotebush, rather than a requirement for specific soil properties (Anderson 1986, Anderson 1993).

Arizona cliffrose populations in the state are genetically variable, exhibit phenotypic plasticity in response to environmental conditions, and hybridize with common cliffrose. These factors have complicated taxonomic identification and quantification of population sizes. Phenotypic and genetic variability between populations has been studied using morphometrics and DNA analysis. These studies that *P. subintegra* is distinct from the more common *P. stansburiana*, despite sometimes overlapping plant characteristics (USFWS 1995). Introgression or hybridization between *P. subintegra* and the more common *P. stansburiana* has resulted in hybrid swarms in the Tonto Basin and Verde Valley of central Arizona (USFWS 1995). Hybrid plants were found in areas supporting Arizona cliffrose along Mingus Avenue near Cottonwood and appear to grow more readily in disturbed areas (USFWS 2001). The proliferation of hybrids has the potential to negatively affect long-term population dynamics of Arizona cliffrose through loss of genetic integrity (Fitts *et al.* 1993).

The total population size of Arizona cliffrose is not known, and has only been estimated. Not all areas of potential habitat have been surveyed, and in some areas (e.g. Cottonwood) the presence of hybrids or introgressed forms has made quantification of total numbers difficult (USFWS 2001). Twenty years ago, the total population size for all four sites was estimated to exceed 40,000 plants, however a large percentage may include hybrids (USFWS 1988).

The largest Arizona cliffrose populations are known to occur in the Verde Valley and near Burro Creek. At the time of listing it was estimated there was 600 acres of habitat at Burro Creek, 100 acres at Bylas, and an estimated total of 700 plants (USDI 1984). Now, roughly 10,000 plants are thought to occur in the largest subpopulation at Burro Creek (USFWS 2004). Discovery of plants in the Verde Valley and at Horseshoe Lake and two smaller subpopulations at Burro Creek

substantially increased the known geographic range and population size of the species. The Verde Valley population is the largest, covering over 1,000 acres (USFWS 1995), but total plant numbers are not known. The Verde Valley Botanical Area (VVBA) established in 1987 is thought to contain 50 to 60 percent of the plants in the Verde Valley. Completion of the Mingus Avenue Extension impacted an estimated 600 Arizona cliffrose within about 12 acres of ROW. Based on these figures, the Arizona cliffrose population in the Verde Valley is conservatively estimated to include several tens of thousands of plants. South of the Verde Valley, the Horseshoe Lake population is estimated to include 750 plants (USFWS 1987).

Arizona cliffrose reproductive output is potentially large, but recruitment rates vary among populations. No demographic studies have been completed in any populations to determine whether recruitment rates are sufficient to maintain or increase population sizes (USFWS 1995). The Cottonwood population appears to have the most recruitment and is likely to be the most stable, while the other populations appear to have poor recruitment (USFWS 1995). When the species was listed, the Burro Creek and Bylas populations were found to lack fertile seeds and have low seedling recruitment, suggesting that reproduction was inadequate to maintain the existing population size (USDI 1984). Factors potentially affecting reproductive output include browsing by animals; climatic conditions that influence fruit production, seed viability, and seedling recruitment; and ground-disturbance that affect seedling and adult survival.

Grazing by livestock, feral animals, and wildlife threatens the long-term survival of Arizona cliffrose (Phillips 1986, Phillips *et al.* 1980, Rutman 1992, USDI 1984, USFWS 1995). This relatively palatable shrub often receives moderate to heavy grazing pressure when exposed to ungulate herbivores (livestock, deer, and/or wild burros), particularly in the vicinity of water sources and frequently used trails (Bingham 1976, Phillips *et al.* 1980, Reichenbacher 1987). Tender seedlings, new growth, and branches with flowers and developing fruit are preferentially selected (Bingham 1976, Denham 1992). Observations and preliminary data analysis of BLM exclosure studies on the Burro Creek population indicate that consistent yearly browsing pressure may have reduced the vigor and/or form-size class of the remaining plants. Reduced vigor may result in less than optimal reproductive success, and the presence of livestock is also thought to reduce seedling establishment (USFWS 1995). The extent to which browsing has altered successful reproduction in any Arizona cliffrose population has not been quantified (USFWS 2001). However, the studies conducted at Burro Creek showed that exclusion of livestock reduced browsing of Arizona cliffrose from 65 percent to between 16 and 18 percent. The relatively low levels of browsing following exclusion of livestock and burros were attributed to mule deer and other wildlife (USFWS 1995).

The Burro Creek population occurs on BLM administered lands. Primary threats to the species in this area are grazing by wildlife, livestock and feral burros; mining; road and utility development; recreational developments; and off-highway vehicle (OHV) use (USFWS 1991). Exclosure studies at this site suggest that browsing by large animals reduces the vigor of plants and may reduce reproductive success. Mining and exploration activities for the extraction of bentonite have resulted in a loss of 14 percent of Arizona cliffrose habitat in the Burro Creek area. This population is divided by a graded dirt road and parallel natural gas pipeline and overhead electric power line easements (USFWS 2001). Increased recreational activity from development of the Burro Creek campground and from rock-collecting activities and associated OHV travel may also affect seedling establishment and survival of adult plants (USFWS 2001). The Kingman Resource Management Plan (BLM 1993) was approved in 1995 and established the 1,119-acre Clay Hills Area of Critical

Environmental Concern (ACEC; USFWS 2004). Approximately 98 percent of the Arizona cliffrose population at Burro Creek occurs within the fenced-off portion of the ACEC. Only a small population of about 100 plants several miles from the main population is located outside the ACEC (Anderson, J., BLM, pers. comm.).

Primary threats to the Bylas Arizona cliffrose population are livestock grazing and road maintenance/construction activities. Observations suggested that livestock grazing had substantially reduced seedling recruitment at this site (USFWS 1995, AGFD 2001). At the time of listing, there was a concern regarding potential widening of U.S. Highway 70, which bisects this population, and herbicide application for road shoulder maintenance. No special land management designations or other special protections are afforded this population, although the Arizona Department of Transportation (ADOT) agreed to contact the FWS regarding any activities potentially affecting Arizona cliffrose in this area (USDI 1984).

The Horseshoe Lake population includes several subpopulations and is found on the TNF. This population was the subject of a biological opinion issued on March 10, 1987, for the Central Arizona Water Control Study Plan 6. Although the dam was never constructed (USFWS 2001), the biological opinion anticipated that 250 plants would be affected due to construction and operation of the Cliff Dam (33% of the Horseshoe Lake population, USFWS 1987). Increased recreation from the development of a Forest Service recreation area may pose a threat to the Lime Creek subpopulation (AGFD 2001).

The Cottonwood population is the largest and occurs on lands administered by the Coconino National Forest, Arizona State Parks, Arizona State Land Department, and privately-held lands. Threats to this population include grazing by livestock and wildlife, road development and maintenance, urban development, and recreation (USFWS 2001).

ENVIRONMENTAL BASELINE

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

Invasive plants on the TNF

The TNF describes that invasive plant species have increased in abundance on the TNF and in areas surrounding the TNF (USFS 2012). The Southwest Region is currently undergoing drought conditions, which likely influences the distribution of native plant species and the spread of invasive noxious weeds. Yellow starthistle and diffuse knapweed were first detected in the Town of Young over two decades ago, and now 10,000 acres of yellow starthistle is estimated to occur in just Gila County (USFS 2012). Thirty-years ago, no Malta starthistle occurred along Highway 188, and it now occurs along 25 miles of this highway and extends to approximately 38,000 acres in Tonto Basin on both sides of Roosevelt Lake (USFS 2012). Malta starthistle has also been identified growing throughout the Phoenix, Scottsdale, Cave Creek/Carefree, and Tempe, Gisela, Superior, Apache Junction, Mesa, and Punkin Center areas, mainly in small localized areas of less than a few acres (USFS 2012). Fountain grass, used for ornamental plantings in the greater Phoenix

metropolitan area, now occurs along highways throughout most of the lower elevation districts of the TNF (USFS 2012). Buffelgrass is moving toward the TNF from southern Arizona (USFS 2012). Although there are fewer acres of weeds on the TNF than on many other National Forests in the West, weed populations are expanding (USFS 2012).

Southwestern willow flycatcher on the TNF

Actions on and off the TNF have influenced the condition of flycatcher habitat and their population distribution and abundance within the TNF. Actions such as water diversion, groundwater pumping, habitat clearing, flood control, urban/agricultural development, dam building, and dam operations, have changed surface and subsurface stream flows, and in combination with historical and current land uses such as livestock grazing, road developments, off-road vehicle, etc. have altered the quality, distribution, abundance, and longevity of riparian vegetation (USFWS 2002).

Riparian habitats by nature are dynamic, with their distribution and quality governed mostly by flood events and flow patterns. Current conditions along southwestern rivers and streams throughout much of the TNF are such that normal flow patterns have been modified, flood events are more catastrophic as a result of degraded watershed conditions, stream channels are degraded, floodplains and riparian communities are reduced in extent, wildfires in riparian habitats are increasing, and similarly riparian communities are more flammable due to water management and the associated increase of exotic plant species. Habitat loss and fragmentation can lead to increased brood parasitism and nest predation. These conditions have diminished the potential for southwestern rivers and streams to develop suitable nesting habitat for the southwestern willow flycatcher and for those habitats to remain intact and productive for nesting flycatchers (USFWS 2002).

Throughout the TNF, there are streams where flycatcher breeding habitat exists and the bird's presence is known (but its distribution and abundance is not always known), and other areas where its breeding status is unknown. The areas where birds are nesting or are most likely to be nesting on the TNF are the Verde and Salt rivers, Tonto Creek, Roosevelt Lake and Horseshoe Lake. The Verde River is an unregulated stream until it reaches Horseshoe and Bartlett dams at the lower third of the river; however the limited storage capacity of these dams allows the largest flood events to continue downstream. Tonto Creek and the Salt River are unregulated until it reaches their confluence at Roosevelt Lake. Downstream from Roosevelt Lake, the Salt River is significantly regulated via three additional water storage reservoirs.

The general Roosevelt Lake/Tonto Creek/Salt River population on the TNF can be the densest location of nesting flycatchers in Arizona and at times has also been the densest throughout the birds' range, with nearly 200 flycatcher territories. There are other locations on the TNF where flycatchers may occur now or in the future due to flycatchers nesting on nearby private lands, change in habitat conditions over time, or improved survey coverage of TNF lands (i.e. Pinal Creek, Cherry Creek, Greenback Creek, etc.). Because the flycatcher's habitat conditions are dynamic, so is the bird's distribution and abundance. This can especially be true due to the lake level fluctuations at Roosevelt Lake.

Protective measures and management of various land uses have been implemented at known locations by the TNF and non-Federal partners to maintain and/or improve habitat conditions, and to prevent, reduce, minimize, and/or mitigate for potential adverse effects to the flycatcher. For example, at Roosevelt Lake on the TNF, vehicle entry is prevented into key habitat areas during the

breeding season to reduce the likelihood of disturbance to flycatchers and alteration of habitat through off-road vehicle use and/or accidental fires. The TNF developed the Tonto Creek Riparian Unit (along the lower portion of Tonto Creek) with the U.S. Bureau of Reclamation to improve riparian habitat conditions. SRP is also implementing two Habitat Conservation Plans through section 10 of the Act for the operation of Roosevelt Dam and Horseshoe/Bartlett dams. The Cave Creek Ranger District is also implementing improved recreation management measures from Needle Rock downstream to the Fort McDowell Tribal Boundary that may help reduce the use of vehicles and other habitat altering activities in the floodplain, and improve the overall abundance of riparian habitat.

On the TNF, southwestern willow flycatchers are known to nest within the conservation space at Roosevelt Lake (Salt River and Tonto Creek arms), Horseshoe Lake (Verde River) and on main stem Salt River, Verde River, Tonto Creek, and nearby tributaries such as Cherry or Rye creeks. Flycatchers can also be found nesting adjacent to TNF lands near Pinal Creek and Roosevelt Lake (Rockhouse Farm demonstration site). The distribution and abundance of flycatcher territories should be expected to fluctuate over time.

The flycatcher nesting habitat on the TNF is comprised of mixed proportions of salt cedar and willow, with various other supporting riparian plant species such as cottonwood, sycamores, etc. Some breeding sites can be comprised of nearly 100 percent native species, while others can be nearly 100 percent salt cedar.

In Tonto Basin, the distribution of nesting flycatchers for about the first 10 years after listing was mostly in close proximity to Roosevelt Lake. However, nesting flycatchers have been detected farther away from Roosevelt Lake, farther upstream along Tonto Creek, the Salt River, and other nearby streams. Now, flycatcher breeding sites on Tonto Creek occur from near the Town of Gisela on Tonto Creek downstream to Roosevelt Lake. Along the upper Salt River, they occur at Gleason Flat and above Roosevelt Lake in the Coon and Chalk creek areas. Away from the main drainages, they have been detected nesting along Pinal Creek, Cherry Creek, and along Rye Creek and Greenback Creek confluences with Tonto Creek.

The movement of flycatchers to more locations along Tonto Creek and the Salt River is likely a product of increasing and sustained Roosevelt Lake levels and improved habitat conditions along streams. As Roosevelt Lake's water elevation stays elevated, flycatchers are more likely to seek out other nearby areas to nest. At the same time, areas along Tonto Creek and the Salt River have improved in nesting habitat quality for flycatchers at areas such as Gleason Flat on the upper Salt River.

From 2009 to 2011, the Tonto Basin Ranger District surveyed and detected flycatchers at a variety of locations throughout the District (Madera, A., USFS, pers. comm.). Nesting flycatchers were detected at eight breeding sites on the Tonto Creek drainage, with the total number of territories detected increasing annually from 35 to 60. Over the same time period, on the Salt River drainage, the TNF detected flycatchers at seven breeding sites, ranging from 28 to 33 territories.

Along the Verde River within the TNF boundaries, nesting flycatchers have occurred primarily in the Horseshoe Lake area. Nesting has occurred within the conservation space of the lake, immediately upstream of the lake within the Ister Flat area, and downstream of Horseshoe Dam near the KA Ranch area. Since 2002, the Horseshoe Lake/Ister Flat area has held between 6 and 20

flycatcher territories (Dockens and Ashbeck 2011). Most recently, a total of 10 territories occurred at the uppermost portion of the Horseshoe Lake/Ister Flat area, with a couple found farther north toward Sheep Bridge (Dockens and Ashbeck 2011). Downstream of Horseshoe Dam, flycatcher territories are known to occur in the KA Ranch area, with a total of seven territories detected in 2011 (Willard, T., USFS, pers. comm.).

Due to reported sightings from bird watchers, flycatchers may also have territories occurring along at Tribal/TNF border lands near the Salt/Verde confluence (Beatty, G., USFWS, pers. comm.).

Migratory southwestern willow flycatchers can also be found throughout the TNF during the months of April/May and August/September, using areas temporarily for shelter and foraging. Migratory birds are typically found in riparian areas, but the quality of habitat they use can vary. As a result, they can be found in a much broader habitat quality and in more unpredictable locations.

Southwestern willow flycatcher critical habitat occurs on the TNF on Tonto Creek, the Salt River, and Verde River. Along Tonto Creek, critical habitat is designated for 19.7 miles (31.7 km) from the Rye Creek/Tonto Creek confluence to the conservation space at Roosevelt Lake. On the Salt River, critical habitat is designated for 17.6 miles (28.3 km) from the Cherry Creek/Salt River confluence to the conservation space at Roosevelt Lake. On the Verde River, critical habitat is designated for 23 miles (37 km) from the East Verde/Verde River confluence to conservation space at Horseshoe Lake. Another Verde River segment occurs farther downstream for 4.1 miles (6.5 km) from Horseshoe Dam to the USGS gauging station. In 2005, flycatcher critical habitat was proposed for the areas within the conservation space of Roosevelt Lake, but was excluded due to the management by SRP, USBR, and the USFS.

Proposed flycatcher critical habitat occurs in similar areas to the existing designation, with some exceptions (USFWS 2011). Along Tonto Creek, flycatcher critical habitat begins a little farther upstream of the current Tonto Creek/Rye Creek confluence to the Town of Gisela and extends to Roosevelt Lake. The proposed upper Salt River segment upstream of Roosevelt Lake is the same as currently designated. Similar to our 2004 critical habitat proposal, the conservation space of Roosevelt Lake is proposed as critical habitat, but also is identified as an area being considered for exclusion. The Verde River segments proposed are the same areas identified in our 2004 proposal, and we have also identified the conservation space of Horseshoe Lake as an area we are considering for exclusion. A small portion of the TNF occurs on the newly proposed segment on Pinal Creek.

Arizona hedgehog cactus on the TNF

The Globe Ranger District manages 90 percent of the known Arizona hedgehog cactus habitat (USFWS 2005). The Arizona hedgehog cactus grows in areas north, south, and to the east of the Oak Flat Campground, within the ROW of U.S. Highway 60, from Top of the World to the east slope of Pinto Creek Canyon, and the areas surrounding the Towns of Miami and Globe.

No long-term monitoring for the Arizona hedgehog cactus has been established for plants in their natural environment. Therefore, information on the status of the cactus throughout the TNF is limited to transplanted individuals or plants whose status was reviewed during the section 7 consultation process. The Carlota Copper Mine created a cactus garden for the Arizona hedgehog cacti transplanted during development of the mine's footprint and eight demographic plots. The Carlota Mine has monitored these plants since 1996. Since 1999, the cactus garden has experienced

a 54 percent decline in plant numbers from the original 275 transplants down to 125 plants as of 2010. The decline was partly attributed to the garden not being actively managed between 2002 to 2006 then natural mortality in the past few years (Cedar Creek 2010). The TNF committed to monitoring 128 Arizona hedgehog cacti (22410-2009-F-0229) for a period of 15 years beginning in 2010. Because this just recently occurred, no information about the cacti's status is available

The use, maintenance, and construction of roads for accessing mining, grazing, and recreation sites may impact the Arizona hedgehog cactus which often grows along roadsides or within established ROWs. The TNF is currently working on their Travel Management Plan, and FWS is in early consultation with USFS on this project. The proposed action states, "there are approximately 4,290 miles of NFS roads on the Tonto NF, of which approximately 3,670 miles are currently open to the public for motorized travel." The TNF proposed to open an additional 820 miles of roadway on the Forest, which may affect the cactus and its habitat since road construction has been identified as a threat. Road construction and maintenance by ADOT will continue to be potential threats to Arizona hedgehog cactus that grow in the ROW of U.S. Highway 60.

The Arizona hedgehog cactus occurs in the following grazing allotments where plants may be at risk from cattle: Devil's Canyon, Bellevue, Superior, Millsite, and Bohme. In addition, the Arizona hedgehog cactus may occur in the Hobbs, Capitan, Coolidge-Parker, and Pinto Creek allotments, and subpopulations may also include Lyons Fork, Radium, Winters, and one pasture in the Hicks-Pikes Peak. Those cacti growing in a soil matrix on slopes less than 60 percent are believed to be at the greatest risk from physical damage by livestock.

Mining activities and associated road construction evaluated in previous section 7 consultations have resulted in the loss of the Arizona hedgehog cactus in the wild, and the loss, degradation, and fragmentation of its habitat. The species occurs adjacent to the footprint of the OMYA Mine, near drill sites and exploratory drill sites owned by Resolution Copper, and within the Carlota Copper Mine, now Quadra Mine. For the recent Resolution Copper project, FWS found that 20 plants may be transplanted and 34.82 acres of habitat lost or disturbed, further diminishing the baseline of this species. The Carlota Mine also resulted in the loss of 270 plants (Cedar Creek 2009) and disturbance to 23.94 acres.

In 2012, we determined that the continued implementation of the TNF's Land Management Resource Plan (2012-F-0011) would not jeopardize the continued existence of the species. We recommended the TNF implement species and habitat management objectives (such as developing "safe sites"), participate in the development of a recovery plan, and work with mining industry to develop conservation easements and mitigation banks.

Arizona cliffrose on the TNF
The only known occurrences of Arizona cliffrose on the TNF occur near the Horseshoe Lake area at elevations between 2,100 and 2,700 feet. There is no recent information on the distribution, abundance, and status of the cliffrose in this area. No major events are believed to have recently affected cliffrose habitat, however recent wildfire occurred adjacent to its known location, and drought across the Southwest Region is occurring.

Malta starthistle that occurs in the Horseshoe Lake area have been identified and mapped in close proximity to endangered Arizona cliffrose populations. The Cave Creek Complex Fire of 2005 stopped short of burning through cliffrose habitat because the white limestone substrate where the plant grows does not support a dense vegetative groundcover. However, Malta starthistle may grow well even on the white tertiary lakebed sediment where the cliffrose populations occur.

EFFECTS OF THE ACTION

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action that will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

Southwestern willow flycatcher

Due to implementing flycatcher conservation measures such as avoidance of areas with high concentrations of flycatcher territories, habitat evaluations, pre-treatment surveys, buffer zones, seasonal limitations, and implementation of BMPs and the RPMPA (White 2007), we do not anticipate any adverse direct or indirect effects to flycatchers resulting in incidental take as result of the proposed action. We do anticipate that there will be some short-term temporal adverse affects on the flycatcher, but will not result in any incidental take, nor preclude the subspecies recovery. We also anticipate that there will some short-term adverse affects to designated flycatcher critical habitat as a result of the proposed salt cedar treatments.

<u>Direct Effects</u>

Salt and Verde River and Tonto Creek salt cedar treatments
Salt cedar treatment on select areas of the Salt and Verde rivers and Tonto Creek, where flycatcher are expected to occur, will happen during the flycatcher non-breeding season (September through March) when the flycatcher is outside of the United States and migrating to Central America and possibly northern South America. Because flycatchers will not be present when salt cedar treatment activities are occurring, we do not anticipate any adverse direct effects to the flycatcher as a result of these treatments.

Other noxious weed treatments (non salt cedar)
Treatment for other noxious weeds (non salt cedar) will be removed through manual, mechanical, and biological (livestock & invertebrate releases) methods; torching; herbicide application; and usually some combination of these methods. The restoration phase will consist of cultural and erosion control actions (i.e. revegetation). Because treatments of other noxious weeds will not target plants the flycatcher relies upon, or occur within flycatcher nesting habitat, we anticipate any application of these methods will occur on the perimeter or away from essential flycatcher activity or habitats, and therefore the application of these methods will not result in direct effects to the flycatcher, resulting in mortality or harassment.

Indirect Effects

Salt River and Tonto Creek salt cedar treatments
Salt cedar treatment along the upper Salt River and Tonto Creek will avoid segments of stream where flycatchers are known to be nesting and anticipated areas where flycatcher nesting habitat is most likely able to develop. These avoidance areas on the Salt River extend from the water conservation space of Roosevelt Lake upstream to the Highway 188 Bridge, and select locations near Nail Creek, and at Redmond Flat, Horseshoe Bend, and Gleason Flat. The avoidance areas on Tonto Creek include the stream segment from the southern end of the Town of Gisela downstream and into the Tonto Creek portion of the conservation space of Roosevelt Lake. The entire Roosevelt Lake conservation space will be avoided.

At other locations on the Salt River and Tonto Creek where salt cedar treatments are proposed to occur, the TNF will evaluate the areas for flycatcher habitat, determine whether surveys are appropriate, and subsequently (based upon any survey results) determine whether any proposed avoidance measures need to be implemented. While these locations are not anticipated to have flycatcher nesting habitat, these conservation measures will help to confirm those expectations. If those expectations are not met, avoidance measures will be implemented to prevent adverse affects to the flycatcher. Because these methods will determine where flycatcher are located, it will ensure treatments will only occur in areas: 1) where there is no flycatcher nesting habitat; 2) flycatchers have not used for nesting for at least three consecutive years; and 3) a quarter-mile around any detected/known territory. We expect these conservation measures will prevent any harm to nesting flycatchers. Therefore, we believe these measures will avoid any adverse indirect effects, and prevent harm to nesting flycatchers on the Salt River and Tonto Creek from salt cedar treatment.

Verde River salt cedar treatments
The primary focus of the TNF's salt cedar treatment is the Verde River. With the exception of the conservation space of Horseshoe Lake (including Ister Flat at the upstream portion of the lake), there are no other proposed salt cedar treatment avoidance areas from the TNF, Prescott and Coconino National Forest boundary (near Childs) downstream past Horseshoe and Bartlett dams to the TNF/Fort McDowell Yavapai Indian Nation boundary.

Outside of the Horseshoe Lake area (including Ister Flat), flycatcher territories are currently known to occur below Horseshoe Dam near KA Ranch. Throughout the entire Verde River treatment area, flycatcher nesting habitat has the possibility of becoming established throughout the 10-year duration of this project. Flycatcher habitat on the Verde River is generally expected to be native-dominated with a smaller component of salt cedar.

Implementation of conservation measures to detect flycatchers prior to salt cedar treatment and avoid territories is anticipated to prevent any adverse indirect effects to any nesting flycatchers on the Verde River. Habitat evaluations and flycatcher surveys, combined with a quarter mile radius avoidance area around known territories, should be adequate to detect the occurrence of flycatchers and avoid alterations to nesting and foraging habitat. Additionally, any area known to have nesting flycatchers must be unoccupied for three years prior to any treatment in that area. Because of these measures, we do not anticipate any harm to flycatchers will occur as a result of Verde River salt cedar treatments. Therefore, we believe these measures will prevent any adverse indirect effects to nesting flycatchers on the Verde River from salt cedar treatment.

Migratory flycatchers
Migrating flycatchers are also anticipated to occur within the action area and within salt cedar treatment areas on the Salt and Verde rivers, Tonto Creek, and possibly other streams segments and treatment areas on the TNF. However, unlike nesting areas, flycatcher migratory stopover areas are of broader habitat quality. Because of the broad quality of habitat used by the flycatcher during migration; the dominance, abundance, and persistence of native riparian vegetation persisting throughout these river drainages; the flycatcher's brief use of migratory stopover areas; and the limited area and amount of salt cedar removed from these stream segments; we do not anticipate that any alteration of their migratory habitat will cause any indirect effects that would result in harm to the flycatcher.

Flycatcher recovery
Unlike areas on Tonto Creek and the Salt River, salt cedar treatments on the Verde River are proposed to occur in areas where it is believed that flycatcher nesting habitat can be established and possibly in areas where flycatcher territories once persisted. While salt cedar is identified in the BA as an undesirable plant, the theories about the adverse affects of the plant on wildlife habitat and birds (excessive water consumption, salt producer, unproductive) have been shown to be inaccurate (Glenn and Nagler 2005, Sogge *et al.* 2005, 2008, Gelt 2008, Stromberg *et al*. 2009, Shafroth *et al.* 2010). Salt cedar has demonstrated that it can be as beneficial to the flycatcher and other wildlife compared to native plant species (Glinski and Ohmart 1984, Sogge *et al.* 2005, Cerasale and Guglielmo 2010), or serve as an adequate substitute (Shafroth 2010). These scenarios occur especially in areas where native plant species no longer flourish due to water and land management actions, or in locations where salt cedar and native plants exist in mixtures (Shafroth *et al.* 2010).

The species composition of riparian plant species along the Verde River throughout the action area will vary, but overall is expected to be native-dominated (>50% native species) (Sogge *et al.* 2010). This is supported by the composition of riparian plants species in known flycatcher breeding sites along the Verde River, and the proportion of salt cedar (10%) proposed to be treated along the Verde River. The dominance of native riparian plant species throughout the Verde River is likely maintained by the unregulated nature of the upper Verde River, and the limited storage capacity of both Bartlett and Horseshoe reservoirs, that allows the largest floods to move downstream (Poff *et al.* 1997). However, because some stressors do occur along the Verde River (river regulation, diversion, agricultural return flow, groundwater pumping, recreation), and due the introduction of salt cedar to the United States (USFWS 2002), we can reasonably anticipate that conditions will continue to help cause salt cedar to persist.

As a result, we anticipate that salt cedar treatments on the Verde River will have an overall adverse short-term temporal affect on the flycatcher and its recovery by reducing the overall abundance of riparian vegetation that could contribute to the establishment of flycatcher territories. The impact of this habitat removal will be minimized by only treating small amounts of salt cedar on the Verde River annually (about 10 acres). Because of the introduction of salt cedar, the persistence of stressors that create favorable conditions for salt cedar on the Verde River, and the overall favorable hydrological conditions that allow native species to dominate, we anticipate that following these salt cedar treatments, both salt cedar and native vegetation will return to areas where vegetation was removed in either similar or possibly better quality.

Other noxious weed treatments (non salt cedar)
Within the riparian areas where flycatchers occur and rely upon the habitat, other mechanical and manual weed treatments (including torching and herbicidal methods) will not target plants flycatchers rely upon. Similarly, biological control agents do not to target riparian plants flycatchers rely upon. Therefore, we do not expect the application of these other methods that could occur in riparian areas to adversely impact flycatcher habitat. Therefore, we do not expect any indirect adverse affects from the treatment of non salt cedar noxious weeds to cause harm to the flycatcher.

<u>Southwestern willow flycatcher critical habitat</u>

The proposed action targets the removal of salt cedar, a primary constituent element 1a (riparian trees and shrubs) of designated and proposed flycatcher critical habitat, on the Verde and Salt rivers. Salt cedar provides the appropriate vegetation structure for flycatcher nest placement, and provides cover and food for dispersing and migrating flycatchers. Salt cedar along all these streams typically grows in combination with the suite of native trees (cottonwood, willow, sycamore, etc.).

Approximately 110 acres of salt cedar is proposed for removal within designated (and proposed) flycatcher critical habitat, 100 acres on the Verde River and 10 acres on the upper Salt River. Removal is anticipated to occur gradually over the l0-year life of the project, with approximately 10 percent of the total being removed annually. As a result, this removal constitutes a measurable adverse affect to flycatcher critical habitat.

Riparian ecosystems on these portions of the Verde and Salt rivers mostly retain their successional nature, and exist in dynamic equilibrium with hydrologic processes. As a result, riparian habitat in these treatment areas are likely to transition into and out of conditions that can be used by flycatchers for a perching, foraging, cover, dispersing, and possibly nesting. This proposed action is anticipated to interrupt those natural processes, and prematurely reduce the overall structure, abundance, and density of riparian habitat by measurably fragmenting treatment areas annually throughout the life of the project. However, we anticipate this adverse affect to critical habitat will be temporal in nature and not permanent, as conditions will persist that will allow salt cedar and native plants to become re-established in these areas.

Arizona cliffrose
Treatments of noxious weeds in Arizona cliffrose habitat is intended to help prevent negative impacts associated with weeds on this plant, especially because of its limited distribution on the TNF. Noxious weeds may be able to encroach into cliffrose habitat, compete with cliffrose and

impact their distribution and abundance, and/or help carry wildfire into cliffrose habitat at a higher frequency or intensity.

The TNF will be implementing methods that are best suited to remove or reduce noxious weeds, and will also implement BMPs and conservation measures to protect existing cliffrose populations. For example, non-specific treatment methods such as broadcasting spraying of herbicides, torching, or use of livestock will not be used in cliffrose habitat. Biocontrol insects are not anticipated to affect Arizona cliffrose plants, because of the species specific nature of the insects. Also, Arizona cliffrose surveys will be conducted in cliffrose habitat prior to any treatment to identify plant locations and minimize the effects of noxious weed treatments.

While we anticipate that these actions will overall have a beneficial impact on cliffrose habitat and populations, it is reasonable to anticipate that not all plants will be detected and that manual treatments or spot applications of herbicides that target dicots could adversely affect an existing cliffrose plant (also a dicot). We expect that this occurrence will be a rare, and at the most, only affect a few individual plants, and therefore will not result in impacts to the overall populations of cliffrose on the TNF.

Arizona hedgehog cactus

Treatments of noxious weeds in Arizona hedgehog cactus habitat is intended to not only remove noxious weeds, but improve the stability and occurrence of Arizona hedgehog cactus. This is especially important because this plant's distribution mostly occurs on the TNF. Herbicides and manual removal will be the methods to target noxious weeds in hedgehog cactus habitat. No torching or use of livestock will be used in Arizona hedgehog cactus habitat to control noxious weeds and biological control insects are expected to be species specific to their targeted weeds and not affect this cactus.

Treatment of noxious weeds along the ROW along U.S. Highway 60 may have a negative impact on Arizona hedgehog cactus, because noxious weeds are attracted to disturbed roadways and Arizona hedgehog cacti occurs nearby. Some herbicides have been tested on Arizona hedgehog cactus in laboratory conditions with adverse affects (USFS 2012). However, because of the rocky nature of this section of roadway, the occurrence of noxious weeds is relatively small. As a result, the application of herbicides in this ROW will be limited. With the implementation of plant surveys and a 20-or 60-foot buffer (depending on distribution) around Arizona hedgehog cacti prior to application, it is expected that effects to the cactus will be minimized.

Within the herbicide treatment buffer zones for Arizona hedgehog cactus or outside of ROWs, weeds will be removed manual. Within these manual treatment areas, persons knowledgeable with the identification of Arizona hedgehog cactus will be on site to help minimize the risk of impacts to the plant.

Both of the conservation measures for herbicidal and manual applications in Arizona hedgehog cactus habitat are anticipated to reduce and minimize, but not eliminate the likelihood of some minor adverse affects. Over the course of this 10-year program it is reasonable to expect that some individual Arizona hedgehog cactus will not be detected and accidently killed or damaged by the application of herbicides or from trampling or unanticipated impacts from manual treatments. These incidents are expected to be rare and infrequent, and should only occur to a few individual

plants and therefore should not be expected to have any long-term affects to the overall population of Arizona hedgehog cactus.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Since the area within the action area is largely managed by the TNF, most activities that could potentially affect these species are Federal activities and subject to additional section 7 consultation. However, because of the proposed action occurs across the entire TNF, actions occurring on non-Federal lands inside and adjacent to TNF lands have the ability to affect species within TNF boundaries. Future non-Federal activities within and adjacent to the action area that are reasonably certain to occur over the life of this project include: power line clearing, road and bridge projects, agricultural land uses, livestock grazing, recreation, land clearing and development, water diversions, groundwater pumping and mining activities. These activities may reduce the quality and quantity of habitat for the flycatcher or the Arizona hedgehog cactus.

Because the known distribution of Arizona cliffrose in this consultation is limited to a small area of the TNF near Horseshoe Lake (somewhat centrally located on the TNF), all future non-Federal cumulative effects are believed to be subject to Federal actions and section 7 of the Act.

CONCLUSION

After reviewing the current status of the southwestern willow flycatcher and its designated critical habitat, the Arizona hedgehog cactus, and the Arizona cliffrose, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that implementation of the "Treatment of Noxious or Invasive Plants on the Tonto National Forest" as proposed, will not jeopardize the continued existence of the Arizona hedgehog cactus, the Arizona cliffrose, or the southwestern willow flycatcher, and is not likely to destroy or adversely modify designated or proposed flycatcher critical habitat.

Southwestern willow flycatcher and critical habitat

We present this conclusion for the southwestern willow flycatcher for the following reasons:

- Surveys and conservation measures will prevent harming or harassing nesting flycatchers from salt cedar treatments.

- Salt cedar removal treatments will not occur along stream segments of the Verde and Salt rivers and Tonto Creek where established populations of nesting flycatchers occur.

- Salt cedar removal treatments will not occur with the conservation spaces of Horseshoe and Roosevelt Lake where existing Habitat Conservation Plans are established and large populations of nesting flycatchers occur.

- Treatment of non salt cedar noxious weeds by mechanical, manual, and biological methods will not target plants the flycatcher relies upon, nor is expected to occur within its habitat resulting in any direct or indirect effects to the flycatcher or its habitat.

- The amount of salt cedar removal is limited to approximately 110 acres in designated and proposed critical habitat, will occur gradually over the life of the project (approximately 11 acres per year), and will not be permanent. As a result, riparian vegetation removal is only temporary and is expected to become re-established in similar or possibly better quality. Therefore, because of the relatively small amount of vegetation impacted, the slow pace in which it will be removed, and the temporal nature of the action (combined with proposed avoidance areas), we believe that designated and proposed critical habitat would remain functional to serve the intended conservation role for the flycatcher.

Arizona hedgehog cactus

We present this conclusion for the Arizona hedgehog cactus for the following reasons:

- Arizona hedgehog cactus habitat occurs in rocky areas where invasive noxious weeds are not as prevalent, therefore extensive treatment of weeds is not likely to occur within its habitat.
- Surveys, conservation measures, and buffer zones are expected to minimize adverse affects from herbicidal and manual weed treatments.
- No broadcast herbicidal spraying, torching, or grazing as a weed management tool will be used in AZ hedgehog habitat. Biocontrol insects are expected to be species specific and not affect Arizona hedgehog cactus.
- It is expected that only rare occurrences of single plants over the life of this 10-year project will be adversely affected.
- Implementation of the project is anticipated to reduce the overall occurrence of noxious weeds that could directly or indirectly impact Arizona hedgehog cactus plants or its habitat.

Arizona cliffrose

We present this conclusion for the Arizona cliffrose for the following reasons:

- Surveys, conservation measures, and buffer zones are expected to minimize adverse affects from herbicidal treatments.
- Non-target specific treatment methods such as broadcasting spraying of herbicides, torching, or use of livestock will not be used in cliffrose habitat. Biocontrol insects are not anticipated to affect Arizona cliffrose plants, because of the species specific nature of the insects.
- It is expected that only single plants, in rare instances, over the life of this 10-year project will be adversely affected from spot applications of herbicides or manual treatment of weeds.
- Implementation of the project is anticipated to reduce the overall occurrence of noxious weeds that could directly or indirectly impact Arizona cliffrose or its habitat.

This biological opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statute and the August 6, 2004, Ninth Circuit Court of Appeals decision in *Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service* (No. 03-35279) to complete the following analysis with respect to critical habitat.

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

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined (50 CFR 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. "Harass" is defined (50 CFR 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns that include, but are not limited to, breeding, feeding or sheltering. "Incidental take" is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, limited protection of listed plants from take is provided to the extent that the Act prohibits the removal and reduction to possession of federally listed endangered plants from areas under Federal jurisdiction, or for any act that would remove, cut, dig up, or damage or destroy any such species on any other area in knowing violation of any regulation of any State or in the course of any violation of a State criminal trespass law.

AMOUNT OR EXTENT OF TAKE

Southwestern willow flycatcher

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

- Salt cedar removal activities will not occur where flycatchers are known to be nesting on Tonto Creek (Gisela downstream to Roosevelt Lake), the upper Salt River (upstream of Roosevelt Lake at Nail Creek, Redmond Flat, Horseshoe Band, and Gleason Flat), Roosevelt Lake and Horseshoe Lake.
- Salt cedar removal activities on the Verde River upstream and downstream of Horseshoe Lake will occur in the non-breeding season and will be preceded by evaluations of habitat quality and surveys to determine the distribution and abundance of any possible flycatcher

territories. If territories are found, salt cedar removal activities will avoid the habitat that makes up these territories in order to prevent any adverse affects.

- Any other potential salt cedar removal areas will be preceded by appropriate habitat evaluations and subsequent surveys to determine flycatcher distribution and abundance. If territories are found, salt cedar removal activities will avoid the habitat the makes up these territories in order to prevent any adverse affects.

Arizona hedgehog cactus and Arizona cliffrose

Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, limited protection of listed plants from take is provided to the extent that the Act prohibits the removal and reduction to possession of federally listed endangered plants from areas under Federal jurisdiction, or for any act that would remove, cut, dig up, or damage or destroy any such species on any other area in knowing violation of any regulation of any State or in the course of any violation of a State criminal trespass law.

Disposition of Dead or Injured Listed Species

Upon locating a dead, injured, or sick listed species initial notification must be made to the FWS's Law Enforcement Office, 2450 W. Broadway Rd, Suite 113, Mesa, Arizona, 85202, telephone: 480/967-7900) within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph if possible, and any other pertinent information. The notification shall be sent to the Law Enforcement Office with a copy to this office. Care must be taken in handling sick or injured animals to ensure effective treatment and in handling dead specimens to preserve the biological material in the best possible state.

If possible, the remains of intact species shall be provided to this office. If the remains of the species are not intact or are not collected, the information noted above shall be obtained and the carcass left in place. Injured animals should be transported to a qualified veterinarian by an authorized biologist. Should the treated species survive, the AESO should be contacted regarding the final disposition of the animal.

CONSERVATION RECOMENDATIONS

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

Southwestern willow flycatcher

1. We recommend that the TNF emphasize improving the distribution of nesting southwestern willow flycatchers by expanding the abundance and distribution of riparian habitat by reducing land management stressors where possible.
2. We recommend the TNF continue to conduct surveys in areas of suitable habitat to determine the distribution and abundance of southwestern willow flycatchers.

Arizona hedgehog cactus and Arizona cliffrose

1. We recommend the TNF conduct surveys of Arizona hedgehog cactus and Arizona cliffrose in previously un-surveyed areas to improve our knowledge about the distribution and abundance of these plants.
2. We recommend that the TNF resume collecting information at previously established Arizona cliffrose monitoring plots (or establish new monitoring plots) to include information about the presence and distribution of noxious weeds and cliffrose demographics, particularly those parameters that may be impacted by noxious weeds (e.g., reproduction, vigor, etc.).
3. We recommend the TNF provide this office any survey or status information on these two plants as the conservation measures for this project is initiated.

REINITIATION NOTICE

This concludes the formal biological opinion for the special use permit for Treatment of Noxious or Invasive Plants on the Tonto National Forest. After listing as threatened or endangered and any subsequent adoption of this conference opinion, the Federal agency shall request reinitiation of consultation if: 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may affect the species in a manner or to an extent not considered in the conference opinion; 3) the agency action is subsequently modified in a manner that causes an effect to the species that was not considered in this opinion; or 4) a new species is listed or critical habitat designated that may be affected by the action.

This also concludes formal consultation on the Treatment of Noxious or Invasive Plants on the Tonto National Forest. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

The FWS appreciates the TNF efforts to identify and minimize effects to listed species from this project. Please refer to the consultation number 22410-2009-F-0018, in future correspondence concerning this project. For further information please contact Greg Beatty (x247) or Debra Bills (x239) at this office.

Sincerely,

/s/ Debra Bills for

Steven L. Spangle
Field Supervisor

Mr. Neil Bosworth, Forest Supervisor

cc: Tonto Basin District Ranger, Tonto Basin Ranger District, Tonto National Forest, Roosevelt, AZ
Payson District Ranger, Payson Ranger District, Tonto National Forest, Payson, AZ
Cave Creek District Ranger, Cave Creek Ranger District, Tonto National Forest, Cave Creek, AZ
Mesa District Ranger, Mesa Ranger District, Tonto National Forest, Mesa, AZ
Pleasant Valley District Ranger, Pleasant Valley Ranger District, Tonto National Forest, Young, AZ
Globe District Ranger, Globe Ranger District, Tonto National Forest, Globe, AZ
Tonto National Forest Biologist, Tonto National Forest Supervisor's Office, Phoenix, AZ
Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ

cc (electronic):
Wildlife Biologist, Fish and Wildlife Service, Phoenix, Flagstaff, Tucson, AZ
(K. Robertson, J. Nystedt, M. Richardson, L. Fitzpatrick, D. Duncan, S. Richardson, J. Servoss and S. Hedwall)

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APPENDIX A- CONCURRENCES

This appendix contains our concurrences with your "may affect, not likely to adversely affect" determinations for following species listed as endangered: desert pupfish, Gila topminnow, lesser long-nosed bat, Yuma clapper rail, and woundfin; and also Gila chub, loach minnow, razorback sucker, and spikedace and their designated critical habitat.

We also provide concurrences with your "may affect, not likely to adversely affect" determinations for the following species listed as threatened: Chiricahua leopard frog and Mexican spotted owl and their designated critical habitat.

In addition, this appendix also contains our concurrence with your "not likely to jeopardize determinations" for the experimental, non-essential population of Colorado pikeminnow.

The TNF provided the following conservation measures for these listed species.

Chiricahua Leopard Frog

1. In Chiricahua leopard frog habitat, if there is a high probability (80% chance) of local moderate rain (0.25 inches or less within 24 hours), then applications will only occur when it is anticipated that there shall be sufficient time (at least four hours) for the application to dry before rainfall occurs. If rainfall of more than a moderate amount (more than 0.25 inches) is predicted locally within 48 hours, applications will be discontinued until predictable local conditions improve. When plant cover is wet from recent rain, heavy dew, or frost, applications will be delayed until conditions are nearly dry.
2. Water will not be drafted from riparian areas with CLF frog populations.
3. The TNF will avoid contamination of CLF frog habitat by roadside herbicide application by not spraying in ditches, riparian areas, and springs.
4. If bare soil results from control of streamside invasive weeds, the TNF will replant with native vegetation to improve soil stability.
5. The TNF will not use tripoclyr (ester formulations) within 500 feet of a CLF protected area or areas where northern garter snakes are known to occur.

Mexican Spotted Owl

1. Herbicide will have the following buffer zones from the perimeter of an occupied PAC or MSO habitat that has not been surveyed. These standards apply only to non-ROW situations.
2. Within both an existing ROW and a PAC, the TNF will apply herbicides during the MSO breeding season (but at least 0.25 mile from the nest). We will use: 1) coarse droplet sizes or nontoxic drift retardants, 2) non-persistent herbicide, and 3) vegetable oil carrier.
3. Dicamba will not be used within 0.25 mile of MSO PACs.
4. No treatments may occur within 0.25 mile of occupied nests.

Yuma Clapper Rail

1. The TNF will apply herbicides per guidelines in RPMPA (White 2007).

2. A TNF biologist will determine nesting areas and identify the site on the ground prior to treatment.
3. A TNF biologist would confirm occupancy during the breeding season (March through July).
4. In occupied breeding areas, treatments adjacent to breeding areas would occur outside the time of occupancy.

Gila Chub, Gila Topminnow, and Desert Pupfish in Small Streams with Adjacent Riparian Habitat

1. When stream flows are 100 cubic feet per second (cfs) or greater, herbicides would be applied per guidelines for large aquatic habitats in RPMPA (White 2007).
2. When stream flows are less than 100 cfs, herbicides would be applied per guidelines in RPMPA (White 2007), with modifications included in the BA's summary table:
    a. Approved herbicides (aquatic formulations only): glyphosate, imazapic, imazapyr may be used within the riparian zone adjacent to but not in the aquatic habitat.
    b. Spot applications to individual plants are permitted within the buffer zone.
    c. For pool habitats, no pesticide applications may occur near pools when there is no surface flow of water in and out of pool or pools. Per the RPMPA (White 2007), a 30-ft buffer would apply when there is no surface flow of water.
    d. When stream flows exceed 100 cfs, may apply guidelines for large riparian habitats.

Colorado Pikeminnow, Loach Minnow, Razorback Sucker, Spikedace, and Woundfin in Large Streams with Adjacent Riparian Habitats

1. When stream flows are 100 cfs or greater, herbicides would be applied per guidelines for large aquatic habitats in RPMPA (White 2007).
2. When stream flows are less than 100 cfs, herbicides would be applied per guidelines in RPMPA (White 2007) with the following modifications found in the BA's summary table):
    a. Approved herbicides (aquatic formulations only): glyphosate, imazapic, imazapyr may be used within the riparian zone adjacent to but not in the aquatic habitat.
    b. Spot applications to individual plants are permitted within the buffer zone.
    c. For pool habitats, no pesticide applications may occur near pools when there is no surface flow of water in and out of pool or pools. Per the RPMPA (White 2007), a 30-ft buffer would apply when there is no surface flow of water.

We base our concurrences on the following:

The proposed action bases the TNF's application of herbicides with protection measures from the RPMPA in Region 2 of the FWS (White 2007) that were developed to protect Federally-listed species, species proposed for listing, and critical habitat. The purpose of the RPMPA guidelines was to provide recommendations for applications involving FWS trust resources. In some instances these recommendations have been modified (USFS 2012), as appropriate, on a case-by-case basis with additional information, as allowed in RPMPA (White 2007).

Chiricahua leopard frog and critical habitat

- The TNF will implement the basic RPMPA strategies and general, pre-spray, and herbicidal BMPs, which include evaluation of known Chiricahua leopard frog locations and any necessary surveys prior to herbicide application. As a result, herbicides will not be applied in aquatic habitats where frogs occur. Herbicides that are applied adjacent to Chiricahua leopard frog habitat are aquatic approved and do not bioaccumulate in body tissues (USFS 2012). Therefore, we anticipate that any direct effects from the process of applying herbicides or the herbicides themselves adjacent to Chiricahua leopard frogs as a result of the TNFs invasive weed program will be insignificant and discountable.
- Only aquatic approved herbicides will be used, following the basic RPMPA strategies and general, pre-spray, and herbicidal BMPs. Additionally, application of low toxicity herbicides (that do not bioaccumulate in body tissues) will consider the weather and precipitation forecast in order to prevent potential unanticipated effects to frogs or frog habitat from run-off, drift, or other potential changes in habitat. Therefore, we anticipate that any indirect effects from application or the herbicides adjacent to Chiricahua leopard frogs or their habitat, as a result of the TNFs invasive weed program, will be insignificant and discountable.
- We expect that the physical and biological features and the primary constituent elements of designated Chiricahua leopard frog critical habitat will be protected by implementing the basic RPMPA strategies and general, pre-spray, and herbicidal BMPs, along with using aquatic approved herbicides, avoiding application during times of precipitation, and avoiding herbicidal use in or near known occupied frog habitat and/or designated critical habitat. As a result, any potential undetectable effects to its habitat or food base from implementing this project will be insignificant and discountable.

Colorado pikeminnow

- Because of the pikeminnow's status as an experimental, non-essential population, these fish found in Arizona are treated as though they are proposed for listing for section 7 consultation purposes. By definition, an experimental non-essential population is not essential to the continued existence of the species. Thus, no proposed action impacting a population so designated could lead to a jeopardy determination for the entire species.

Desert pupfish

- The TNF will implement the basic RPMPA strategies and general, pre-spray, and herbicidal BMPs, which include evaluation of known desert pupfish locations and any necessary surveys prior to herbicide application. As a result, herbicides will not be applied in aquatic habitats where desert pupfish occur. Herbicides that are applied adjacent to pupfish habitat are aquatic-approved, practically non-toxic to fish, applied to spot locations, and do not bioaccumulate in body tissues (USFS 2012). Therefore, we anticipate that any direct effects from the process of applying herbicides or the herbicides themselves adjacent to desert pupfish or their habitats as a result of the TNFs invasive weed program will be insignificant and discountable.

- Only aquatic approved herbicides will be used, following the basic RPMPA strategies and general, pre-spray, and herbicidal BMPs. Additionally, application of low toxicity herbicides (that do not bioaccumulate in body tissues) that are practically non-toxic to fish will be used. As a result, implementing the RPMPA and BMPs will minimize any effects adjacent to desert pupfish habitat or potential runoff, drift, and/or soil erosion from upland treatment areas so that any sediment moving into pupfish habitat would be a small immeasurable amount. Therefore, we anticipate that any indirect effects from application or the herbicides adjacent to the desert pupfish or their habitat as a result of the TNFs invasive weed program will be insignificant and discountable.

Gila chub and critical habitat

- The TNF will implement the basic RPMPA strategies and general, pre-spray, and herbicidal BMPs, which include evaluation of known Gila chub locations and any necessary surveys prior to herbicide application. As a result, herbicides will not be applied in aquatic habitats where Gila chub occur. Herbicides that are applied adjacent to Gila chub habitat are aquatic-approved, practically non-toxic to fish, applied to spot locations, and do not bioaccumulate in body tissues (USFS 2012). Therefore, we anticipate that any direct effects from the process of applying herbicides or the herbicides themselves adjacent to Gila chub as a result of the TNFs invasive weed program will be insignificant and discountable.
- Only aquatic approved herbicides will be used, following the basic RPMPA strategies and general, pre-spray, and herbicidal BMPs. Additionally, application of low toxicity herbicides (that do not bioaccumulate in body tissues) that are practically non-toxic to fish will be used. As a result, implementing the RPMPA and BMP's will minimize any effects adjacent to Gila chub habitat or potential runoff, drift, and/or soil erosion from upland treatment areas so that any sediment moving into Gila chub habitat would be a small immeasurable amount. Therefore, we anticipate that any indirect effects from application or the herbicides adjacent to Gila chub or their habitat as a result of the TNFs invasive weed program will be insignificant and discountable.
- We expect that the physical and biological features and the primary constituent elements of designated Gila chub critical habitat will be protected by implementing the basic RPMPA strategies and general, pre-spray, and herbicidal BMPs, along with using aquatic approved herbicides, avoiding application during times of precipitation and heavier stream flow, and avoiding herbicidal use within Gila chub aquatic habitat. As a result, any potential undetectable effects to its habitat or food base from implementing this project will be insignificant.

Gila topminnow

- The TNF will implement the basic RPMPA strategies and general, pre-spray, and herbicidal BMPs, which include evaluation of known Gila topminnow locations and any necessary surveys prior to herbicide application. As a result, herbicides will not be applied in aquatic habitats where Gila topminnows occur. Herbicides that are applied adjacent to Gila topminnow habitat are aquatic-approved, practically non-toxic to fish, applied to spot locations, and do not bioaccumulate in body tissues (USFS 2012). Therefore, we anticipate

that any direct effects from the process of applying herbicides or the herbicides themselves adjacent to Gila topminnow or their habitats as a result of the TNFs invasive weed program will be insignificant and discountable.

- Only aquatic approved herbicides will be used, following the basic RPMPA strategies and general, pre-spray, and herbicidal BMPs. Additionally, application of low toxicity herbicides (that do not bioaccumulate in body tissues) that are practically non-toxic to fish will be used. As a result, implementing the RPMPA and BMPs will minimize any effects adjacent to Gila topminnow habitat or potential runoff, drift, and/or soil erosion from upland treatment areas so that any herbicide or herbicide treated sediment moving into Gila topminnow habitat would be a small immeasurable amount. Therefore, we anticipate that any indirect effects from application or the herbicides adjacent to the Gila topminnow or their habitat as a result of the TNFs invasive weed program will be insignificant and discountable.

Lesser long-nosed bat

- No records exist for lesser long-nosed bat on the TNF. The nearest confirmed records is from the Phoenix area (20-30 miles west of the TNF) and a possible record in the McDowell Mountains (10 miles west of the TNF). Therefore, while it is not likely bats will come in direct contact with herbicides, any possibility occurrence of coming into contact with any treated flowers and fruits are unlikely because these occur at the tips of flowering stalks and well above the ground and away from adjacent weed treatments. Bats are also active at night, and treatments will occur during the daylight hours. Therefore, we anticipate that any direct effects from the process of applying herbicides or the herbicides themselves to lesser long-nosed bats or their habitats as a result of the TNFs invasive weed program will be insignificant and discountable.
- The lesser long-nosed bat consumes nectar and pollen of agave flowers and the nectar, pollen, and fruit produced by columnar cacti. Agaves and columnar cacti are not the target of any method of weed treatments and are easily identified and avoided. Therefore, we anticipate that any indirect effects from application or the herbicides to lesser long-nosed bat habitat as a result of the TNFs invasive weed program will be insignificant and discountable.

Loach minnow and critical habitat

- The TNF will implement the basic RPMPA strategies and general, pre-spray, and herbicidal BMPs, which include evaluation of known loach minnow locations and any necessary surveys prior to herbicide application. Currently, loach minnows are known to occur only along Fossil Creek within the TNF. As a result, herbicides will not be applied in aquatic habitats where loach minnow occur. Herbicides that are applied adjacent to loach minnow habitat are aquatic-approved, practically non-toxic to fish, applied to spot locations, and do not bioaccumulate in body tissues (USFS 2012). Therefore, we anticipate that any direct effects from the process of applying herbicides or the herbicides themselves adjacent to loach minnow as a result of the TNFs invasive weed program will be insignificant and discountable.
- Only aquatic approved herbicides will be used, following the basic RPMPA strategies and general, pre-spray, and herbicidal BMPs. Additionally, application of low toxicity

herbicides (that do not bioaccumulate in body tissues) that are practically non-toxic to fish will be used. As a result, implementing the RPMPA and BMPs will minimize any effects adjacent to loach minnow habitat or potential runoff, drift, and/or soil erosion from upland treatment areas so that any sediment moving into loach minnow habitat would be a small immeasurable amount. Therefore, we anticipate that any indirect effects from application or the herbicides adjacent to loach minnow or their habitat as a result of the TNFs invasive weed program will be insignificant and discountable.

- We expect that the physical and biological features and the primary constituent elements of designated loach minnow critical habitat will be protected by implementing the basic RPMPA strategies and general, pre-spray, and herbicidal BMPs, along with using aquatic approved herbicides, avoiding application during times of precipitation and heavier stream flow, and avoiding herbicidal use within aquatic loach minnow designated critical habitat (but could target invasive plants within the floodplain outside of streams). As a result, any potential undetectable effects to its habitat or food base from implementing this project will be insignificant and discountable.

Mexican spotted owl and critical habitat

- The TNF will implement the basic RPMPA strategies and general, pre-spray, and herbicidal BMPs, which include evaluation of known MSO and PAC locations and any necessary surveys prior to herbicide application. Herbicides will not be applied within 0.25 mile from occupied MSO nests during the breeding season. Application of herbicides to invasive plants and weeds in MSO habitat could occur within PACs (at least 0.25 mile from occupied nests) during the breeding season, but only along existing roads and trails (where invasive weeds often occur). Treatments will avoid occupied nest areas, will occur during daylight hours along existing regularly used areas, and will be of limited duration. Implementing these evaluation, survey, and avoidance measures is expected to avoid nest locations and limit human activities near MSOs, and as a result, any alteration of MSO behavior is expected to be rare and of short duration. Therefore, we anticipate that direct effects to MSO from the application of herbicides would be insignificant.
- Because treatment of herbicides will avoid occupied MSO nests by 0.25 mile, will be applied during daylight hours when MSO are mostly roosting, and will be applied to small weeds close to the ground, there is virtually no chance to accidently spray MSOs during treatments. As a result, we do not anticipate any application of herbicides onto MSO.
- The application of Dicamba has a slightly higher hazard quotient of 1.0 (Class 2), and as a result, it will only be applied greater than 0.25 mile from any PAC boundary. Therefore, any indirect effect to MSO from consuming prey that had become contaminated with Dicamba is expected to be unlikely, and therefore believed to result in effects that are discountable.
- The basic RPMPA strategies and general, pre-spray, and herbicidal BMPs will be used in MSO designated critical habitat. These measures, plus avoidance measures initiated by the TNF, will result in a limited amount of herbicidal treatment in MSO critical habitat. The targeted invasive weeds in MSO habitat are short stature annuals or herbaceous perennials found along roads or trails. Overall, we anticipate undetectable impacts to the physical and biological features and primary constituent elements of MSO critical habitat (forest structure, prey cover, prey species) for the treatment of invasive weeds in MSO critical habitat. Some beneficial long-term effects could be realized from invasive weed

treatments, by improving native grasses and plants. As a result of the small area of MSO critical habitat treated, the low status weeds targeted, and low toxicity of applied herbicides, we expect there to be virtually no effect to forest structure, and any possible effect to MSO prey species or cover will be insignificant and discountable.

Razorback sucker and critical habitat

- The TNF will implement the basic RPMPA strategies and general, pre-spray, and herbicidal BMPs, which include evaluation of known razorback sucker locations and any necessary surveys prior to herbicide application. Currently, razorback suckers are known to occur along the Verde River within the TNF. As a result, herbicides will not be applied in aquatic habitats where razorback suckers occur. Herbicides that are applied adjacent to razorback suckers habitat are aquatic-approved, practically non-toxic to fish, applied to spot locations, and do not bioaccumulate in body tissues (USFS 2012). Therefore, we anticipate that any direct effects from the process of applying herbicides or the herbicides themselves adjacent to razorback suckers as a result of the TNF's invasive weed program will be insignificant and discountable.
- Only aquatic approved herbicides will be used, following the basic RPMPA strategies and general, pre-spray, and herbicidal BMPs. Additionally, application of low toxicity herbicides (that do not bioaccumulate in body tissues) that are practically non-toxic to fish will be used. As a result, implementing the RPMPA and BMPs will minimize any effects adjacent to razorback suckers habitat or potential runoff, drift, and/or soil erosion from upland treatment areas so that any sediment moving into loach minnow habitat would be a small immeasurable amount. Therefore, we anticipate that any indirect effects from application or the herbicides adjacent to razorback suckers or their habitat as a result of the TNF's invasive weed program will be insignificant and discountable.
- We expect that the physical and biological features and the primary constituent elements of designated razorback sucker critical habitat will be protected by implementing the basic RPMPA strategies and general, pre-spray, and herbicidal BMPs, along with using aquatic approved herbicides, avoiding application during times of precipitation and heavier stream flow, and avoiding herbicidal use within aquatic razorback sucker designated critical habitat (but could target invasive plants within the floodplain outside of streams). As a result, any potential undetectable effects to its habitat or food base from implementing this project will be insignificant and discountable.

Spikedace and critical habitat

- The TNF will implement the basic RPMPA strategies and general, pre-spray, and herbicidal BMPs, which include evaluation of known spikedace locations and any necessary surveys prior to herbicide application. Currently, spikedace are known to occur only along Fossil Creek within the TNF. As a result, herbicides will not be applied in aquatic habitats where spikedace occur. Herbicides that are applied adjacent to spikedace habitat are aquatic-approved, practically non-toxic to fish, applied to spot locations, and do not bioaccumulate in body tissues (USFS 2012). Therefore, we anticipate that any direct effects from the process of applying herbicides or the herbicides themselves adjacent to spikedace as a result of the TNF's invasive weed program will be insignificant and discountable.

- Only aquatic approved herbicides will be used, following the basic RPMPA strategies and general, pre-spray, and herbicidal BMPs. Additionally, application of low toxicity herbicides (that do not bioaccumulate in body tissues) that are practically non-toxic to fish will be used. As a result, implementing the RPMPA and BMPs will minimize any effects adjacent to spikedace habitat or potential runoff, drift, and/or soil erosion from upland treatment areas so that any sediment moving into loach minnow habitat would be a small immeasurable amount. Therefore, we anticipate that any indirect effects from application or the herbicides adjacent to spikedace or their habitat as a result of the TNF's invasive weed program will be insignificant and discountable.
- We expect that the physical and biological features and the primary constituent elements of designated spikedace critical habitat will be protected by implementing the basic RPMPA strategies and general, pre-spray, and herbicidal BMPs, along with using aquatic approved herbicides, avoiding application during times of precipitation and heavier stream flow, and avoiding herbicidal use within aquatic spikedace designated critical habitat (but could target invasive plants within the floodplain outside of streams). As a result, any potential undetectable effects to its habitat or food base from implementing this project will be insignificant and discountable.

Woundfin

- The TNF will implement the basic RPMPA strategies and general, pre-spray, and herbicidal BMPs, which include evaluation of known woundfin locations and any necessary surveys prior to herbicide application. Currently, woundfin are not known to occur within the TNF, however during the life of this proposed action, it possible that woundfin could be introduced into the TNF. As a result, herbicides will not be applied in aquatic habitats where woundfin may occur. Herbicides that are applied adjacent to woundfin habitat are aquatic-approved, practically non-toxic to fish, applied to spot locations, and do not bioaccumulate in body tissues (USFS 2012). Therefore, we anticipate that any direct effects from the process of applying herbicides or the herbicides themselves adjacent to future woundfin occurrences as a result of the TNF's invasive weed program will be insignificant and discountable.
- Only aquatic approved herbicides will be used, following the basic RPMPA strategies and general, pre-spray, and herbicidal BMPs. Additionally, application of low toxicity herbicides (that do not bioaccumulate in body tissues) that are practically non-toxic to fish will be used. As a result, implementing the RPMPA and BMPs will minimize any effects adjacent to woundfin habitat or potential runoff, drift, and/or soil erosion from upland treatment areas so that any sediment moving into woundfin habitat would be a small immeasurable amount. Therefore, we anticipate that any future indirect effects from application or the herbicides adjacent to woundfin or their habitat as a result of the TNF's invasive weed program will be insignificant and discountable.

Yuma Clapper Rail

- The TNF will implement the basic RPMPA strategies and general, pre-spray, and herbicidal BMPs, which include evaluation of known Yuma clapper rail locations and any necessary surveys prior to herbicide application. Currently, Yuma clapper rails are known to rarely occur within the TNF. However, if Yuma clapper rails are detected, herbicides

will not be applied in aquatic habitats where Yuma clapper rails occur. Herbicides that are applied adjacent to clapper rail habitat are aquatic-approved, applied to spot locations, and do not bioaccumulate in body tissues (USFS 2012). Therefore, we anticipate that any direct effects from the process of applying herbicides or the herbicides themselves adjacent to Yuma clapper rails as a result of the TNF's invasive weed program will be insignificant and discountable.

- Only aquatic approved herbicides will be used, following the basic RPMPA strategies and general, pre-spray, and herbicidal BMPs. Additionally, application of low toxicity herbicides (that do not bioaccumulate in body tissues). As a result, implementing the RPMPA and BMPs will minimize any effects adjacent to Yuma clapper rail habitat or potential runoff, drift, and/or soil erosion from upland treatment areas so that any sediment moving into Yuma clapper rail habitat would be a small immeasurable amount. Therefore, we anticipate that any indirect effects from application or the herbicides adjacent to Yuma clapper rails or their habitat as a result of the TNF's invasive weed program will be insignificant and discountable.

APPENDIX B – TECHNICAL ASSISTANCE

This appendix contains recommendations from the TNF to reduce the likelihood of take of bald eagles from implementation of the proposed Treatment of Noxious or Invasive Plants. There are no golden eagle (*Aquila chrysaetos*) conservation measures identified in the proposed action.

The final rule to remove the bald eagle from the Federal List of Threatened and Endangered Species was published in the Federal Register on July 9, 2007, and took effect on August 8, 2007. Due to a court order, from 2008 to 2010, the bald eagle in the Sonoran Desert Area of central Arizona was returned to the list of Threatened and Endangered Species. As of September 30, 2010, the court dissolved the injunction and therefore, the bald eagle was subsequently returned to its previous status off of the list of Threatened and Endangered Species.

The primary federal regulation protecting bald and golden eagles is the Bald and Golden Eagle Protection Act. The Eagle Act prohibits anyone, without a permit issued by the Secretary of the Interior, from taking eagles, including their parts, nests, or eggs. "Take" is defined under the Eagle Act as "to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb" eagles. "Disturb" means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based upon the best scientific information available; injury to an eagle; a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior; or nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior (USFWS 2007).

Below are the TNF's proposed conservation measures to reduce, minimize, and/or prevent the likelihood of taking bald eagles in the project area. These measures include strategies identified in the Conservation Assessment and Strategy for the Bald Eagle in Arizona (Driscoll *et al.* 2006) and the RPMPA in Region 2 of the U.S. Fish and Wildlife Service (White 2007). There is proposed monitoring and coordination with AGFD's Bald Eagle Management Program and Arizona Ecological Service's Office to ensure nesting bald eagles are not disturbed. We agree that implementation of the following measures will reduce the likelihood of take.

<u>Bald eagle</u>

- All efforts will be made to implement any noxious or invasive weeds treatments near bald eagle breeding areas outside of the bald eagle breeding season (typically December to June, but can vary depending on location and from season to season).
- Location and status of bald eagle breeding attempts will be acquired from AGFD's Arizona Bald Eagle Management Program and TNF staff.
- If a breeding attempt has failed, treatment may occur within seasonal closures or in close proximity to nest areas (but only after it has been determined that birds have not re-nested within 30 days).
- If during the breeding season there is a need to enter seasonal closures or closer than 0.25 mile of an active or occupied nest without a seasonal closure, a TNF district biologist will be present to observe eagle nesting behavior. If the eagle demonstrates that its nesting behavior is being adversely altered (leaving the nest, vocalizing, stopped feeding young, circling over applicators, etc.) by this action, the treatment will stop and TNF personnel will leave the area immediately.

- The TNF will use only aquatic formulations of the herbicide within bald eagle territories along rivers and creeks.

We agree that implementation of the conservation measures identified above will reduce the likelihood of take of bald eagles. Implementing actions outside of the bald eagle breeding season will typically prevent any actions that could cause a serious disturbance that could result in the take of bald eagles. Close coordination with AGFD will provide the TNF the most up-to-date information on bald eagle locations and as a result, will form the basis of having the best and most recent information in order to make appropriate decisions. Similarly, when circumstances cause the TNF to approach near bald eagle nests during the breeding season to treat weeds, providing a monitor to evaluate the bald eagle's behavior should also reduce the likelihood of preventing a disturbance.

APPENDIX C – TABLES

Table 1. List of Invasive Plant Species for the Tonto National Forest

Scientific name	Common name	AZ Dept. of Agriculture Weed List*	APHIS Weed List	On neighboring states' weed lists?	Tonto category**	AZ-WIP WG class ***
Acroptilon repens	Russian knapweed	P, Res.		CA, CO, NM, NV,UT	A	H
Aegilops cylindrica	Jointed goatgrass	P, Res.		CA, CO, NM	B	L.
Ailanthus altissima	Tree of heaven				B	
Alhagi maurorum	Camelthorn	P, Res.		CA, CO, NM, NV,	A	M
Arundo donax	Giant reed				B	H
Asphodelus fistulosus	Onionweed		x	NM	A	L
Avena fatua	Wild oats			CO	C	M
Brassica nigra	Black mustard				B	
Brassica tournefortii	Asian mustard				C	M
Bromus catharticus	Rescuegrass				C	
Bromus diandrus	Ripgut brome				C	M
Bromus japonicus	Japanese brome				C	
Bromus rubens	Red brome				C	H
Bromus tectorum	Downy brome			CO	C	H
Cardaria draba	Globe-podded hoary cress	P, Res.		CA, CO, NM, NV UT	A	M
Cardaria pubescens	Hairy white-top	P		CA,	A	M
Carduus acanthoides	Plumeless thistle	P		CA, CO	A	
Carduus nutans	Musk thistle			CA, CO, NM, NV, UT	A	M
Cenchrus echinatus	Southern sandbur	P, Reg.		CA,	A	
Cenchrus spinifex	Field sandbur	P, Reg.		CA,	A	
Centaurea biebersteinii	Spotted knapweed	P, Res.		CA, CO, NM, NV, UT	A	M
Centaurea diffusa	Diffuse knapweed	P, Res.		CA, NM, NV, UT	B	M
Centaurea melitensis	Malta starthistle			NM, NV	C	M

Centaurea solstitialis	Yellow starthistle	P, Res.		CA, CO, NM, NV, UT	B	H
Chondrilla juncea	Rush skeletonweed	P		CA, CO, NV	A	M
Chorispora tenella	Blue mustard			CA, CO	A	
Cirsium arvense	Canada thistle	P		CA, CO, NM, NV, UT	A	M
Cirsium vulgare	Bull thistle			CO, NM	C	
Convolvulus arvensis	Field bindweed	P, Reg.		CA, CO, NM, UT	C	M
Dimorphotheca cuneata	White bietou				A	
Dipsacus fullonum	Common teasel			CO, NM	B	
Eleagnus angustifolia	Russian olive			CO, NM	A	H
Elymus repens	Quackgrass	P, Res.		CA, CO, UT	B	L
Eragrostis curvula	Weeping lovegrass				C	L
Eragrostis lehmanniana	Lehmann's lovegrass				C	H
Euphorbia esula	Leafy spurge	P		CA, CO, NM, NV, UT	A	H
Euryops subcarnosus	Sweet resinbush				A	H
Isatis tinctoria	Dyer's woad	P		CA, CO, NM, NV, UT	A	
Kochia scoparia	Kochia				A	
Leucanthemum vulgare	Oxeye daisy			CO	A	L
Linaria dalmatica	Dalmatian toadflax	P, Res.		CA, CO, NM, NV	A	M
Linaria vulgaris	Yellow toadflax			CO, NM, NV	A	M
Lythrum salicaria	Purple loosestrife	P		CA, CO, NM, NV, UT	A	
Melilotus officinalis	Yellow sweetclover				C	M
Nerium oleander	Oleander				B	
Oncosiphon piluliferum	Globe chamomile				B	
Onopordum acanthium	Scotch thistle	P, Res.		CA, CO, NM, NV, UT	B	L
Peganum harmala	African rue	P		CA, CO, NM, NV	A	
Pennisetum ciliare	Buffelgrass	P, Reg.			B	H
Pennisetum setaceum	Fountain grass				B	H

Pentzia incana	Karoo bush				A	
Polygonum cuspidatum	Japanese knotweed			CA,	A	
Potentilla recta	Sulfur cinquefoil			CO, NV	A	
Pyracantha sp.	Pyracantha				B	
Rhus lancea	African sumac				B	M
Salsola kali & S. tragus	Russian thistle				C	
Salvia aethiopis	Mediterranean sage			CA, CO, NV	A	
Schismus arabicus	Arabian schismus				C	M
Schismus barbatus	Mediterranean grass				C	M
Sinapis arvensis	Wild mustard			CO	B	
Tamarix chinensis	Five-stamen tamarisk			NM	C	H □
Tamarix parviflora	Smallflower tamarisk			CO, NM, NV	C	H □
Tamarix ramosissima	Salt cedar			CO, NM, NV	C	H □
Ulmus pumila	Siberian elm			NM	A	M
Vinca major	Periwinkle				B	M

Definitions: *Arizona State Dept. of Agriculture Weed List: P= Prohibited. These weeds are prohibited from entry into the state. **Reg. = Regulated**. These weeds **MAY** be controlled or quarantined if found within the state, to prevent further infestation. **Res. = Restricted.** These weeds **SHALL** be controlled or quarantined if found within the state. ****Tonto Weed List: Class A weeds** are of limited distribution in Arizona, or unrecorded in the state. They pose a serious threat. Management goal is eradication. **Class B weeds** are of limited distribution in Arizona, common in some places in the state. Management goal is to contain their spread, decrease population size, then eliminate. **Class C weeds** have spread beyond our capability to eradicate them. Management goal is to contain spread to present size; then decrease the population if possible. ***AZ-WIPWG = Arizona Wildland Invasive Plant Working Group rating. (SWEPIC 2005) H = High.** These species have severe ecological impacts on ecosystems; invasiveness attributes are conducive to moderate to high rates of dispersal and establishment; species are usually widely distributed. **M = Medium.** These species have substantial and apparent ecological impacts on ecosystems; invasiveness attributes are conducive to moderate to high rates of dispersal, often enhanced by disturbance; ecological amplitude and distribution range from limited to widespread. **L = Low.** These species have minor yet detectable ecological impacts; invasiveness attributes result in low to moderate rates of invasion; ecological amplitude and distribution are generally limited, but the species can be problematic locally.□ = Additional designation for some species whose current ecological amplitude and distribution are limited. Species are capable of invading unexploited natural communities, based on initial, localized observations or behavior in similar ecosystems/communities elsewhere.

APPENDIX D - FIGURES

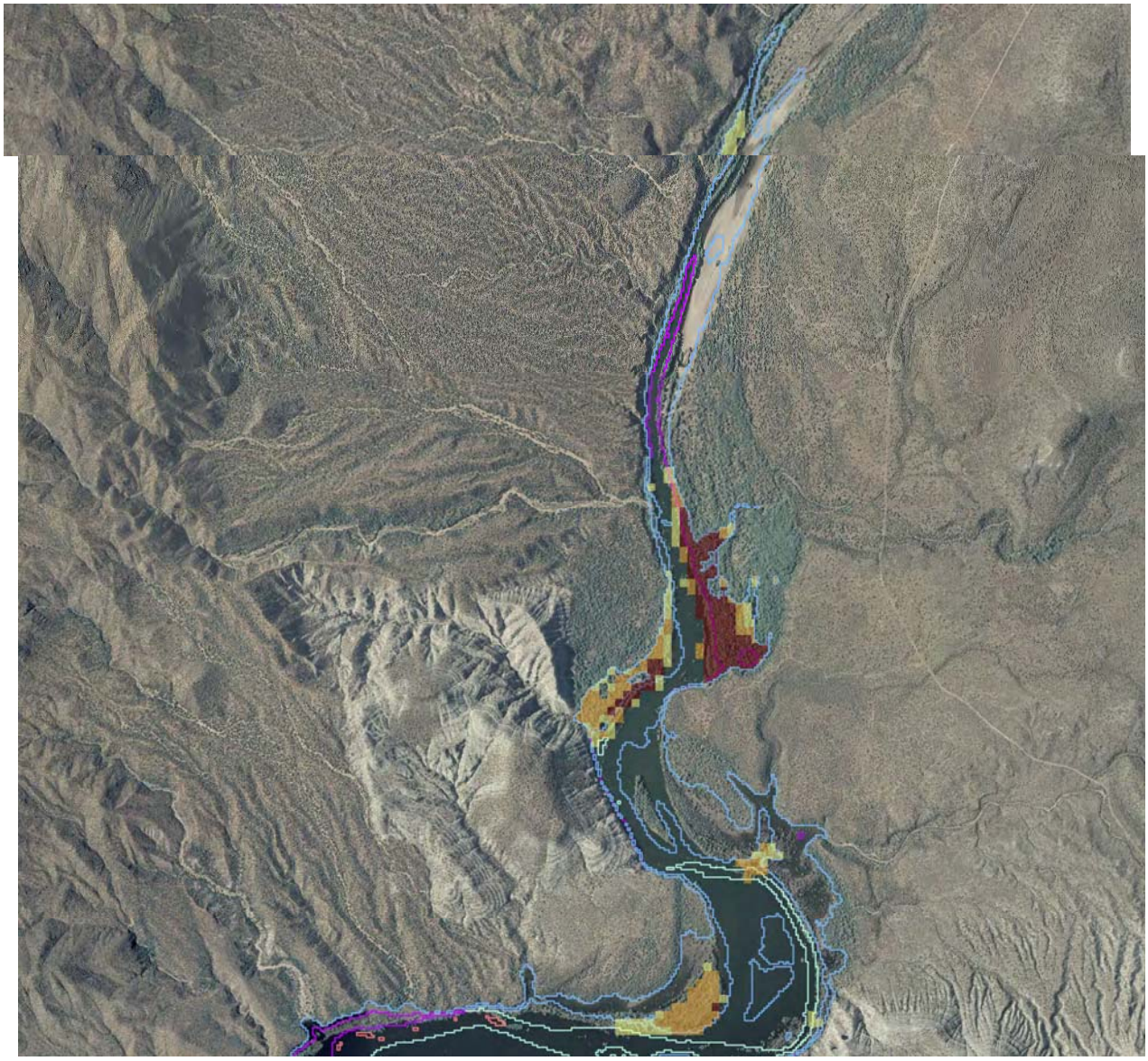

Figure 1. High water mark of the Horseshoe Lake conservation space (blue line) and salt cedar treatment avoidance area at 2026 feet (map provide by Salt River Project), Arizona.

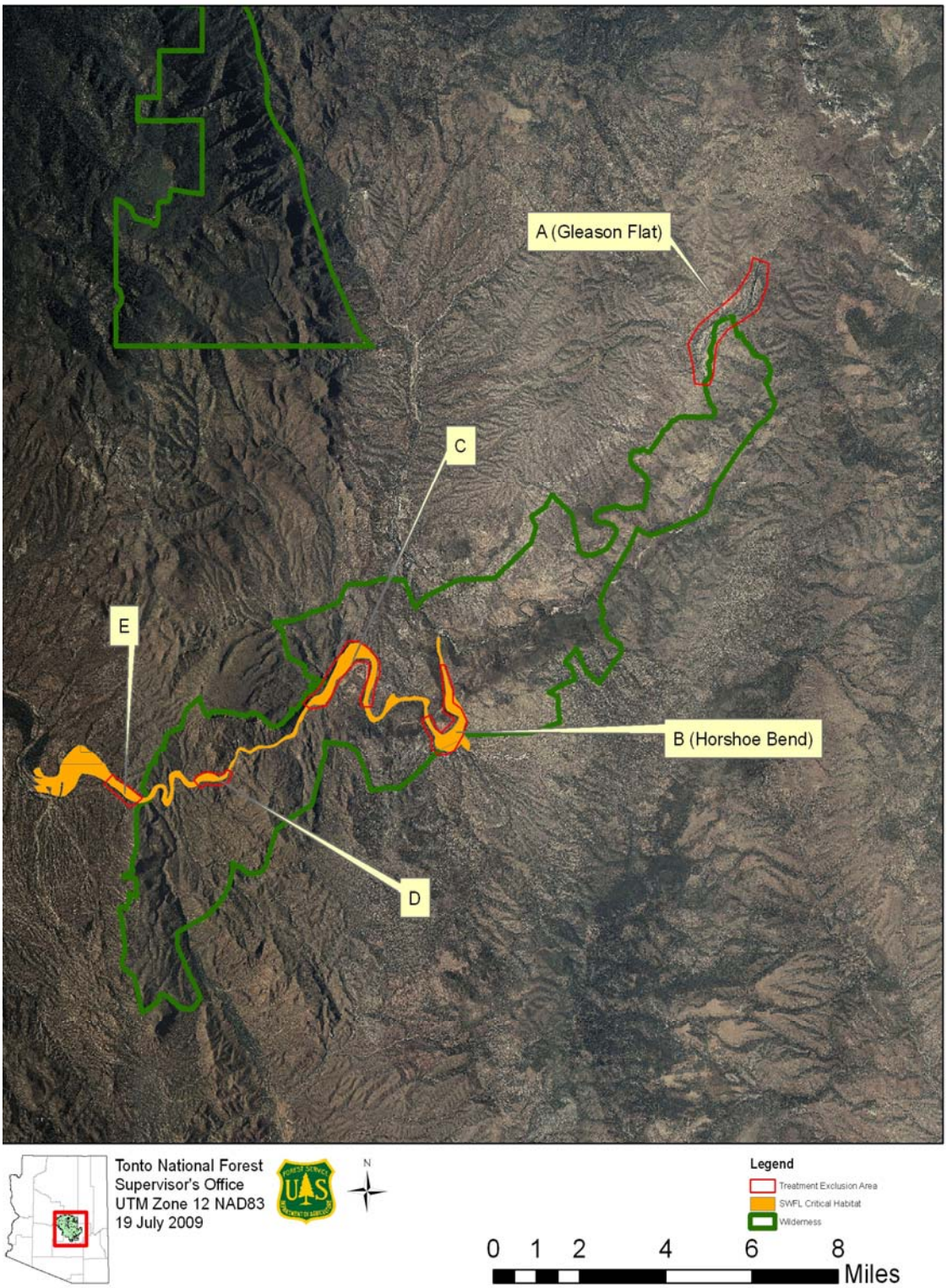

Figure 2. Upper Salt River TNF salt cedar treatment avoidance areas (red lines), Nail Creek (D&E), Redmond Flat (C), Horseshoe Bend (B), and Gleason Flat (A), Arizona.

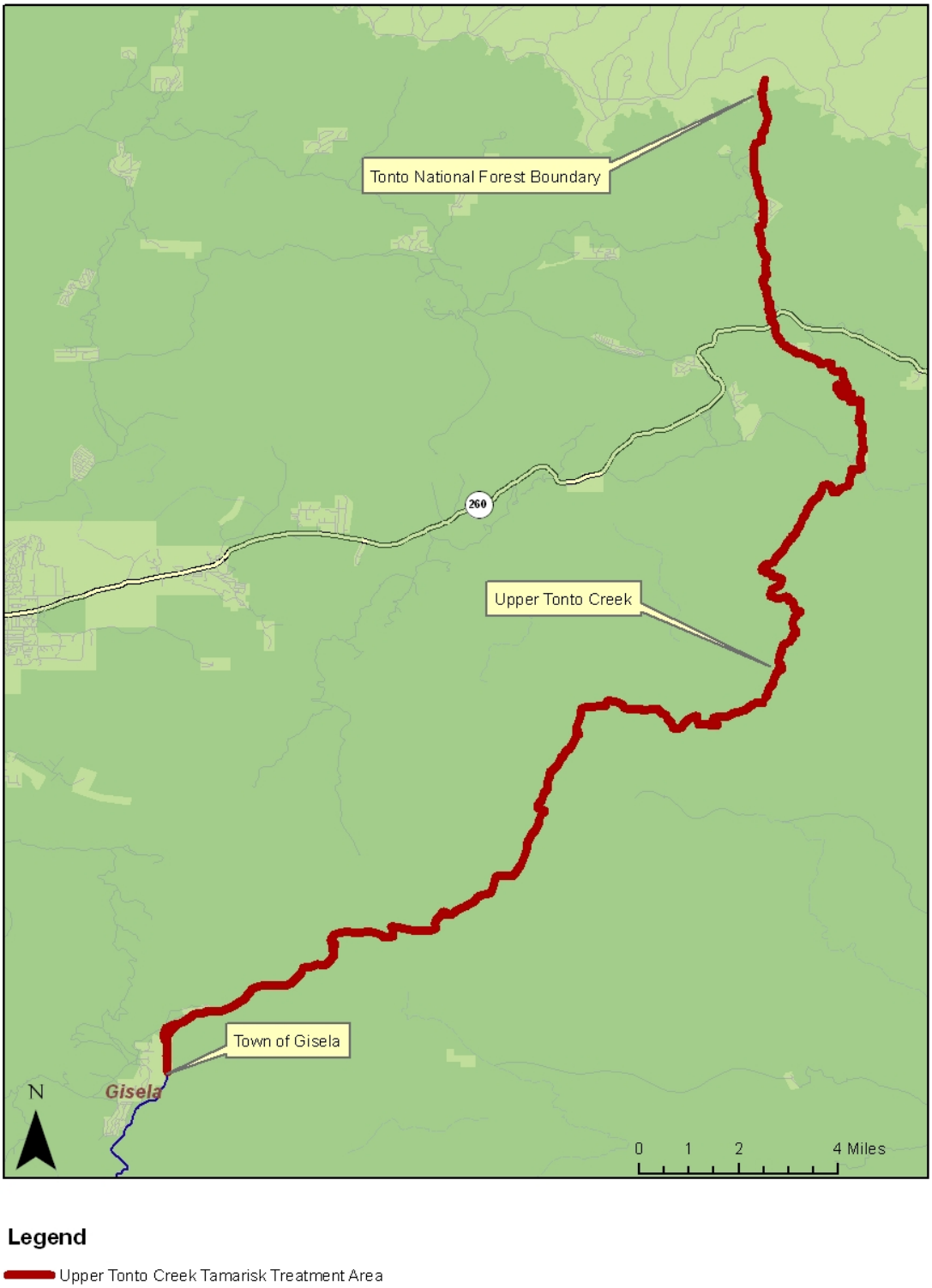

Figure 3. Upper Tonto Creek TNF salt cedar treatment areas from the Town of Gisela upstream to Tonto Spring, Arizona.

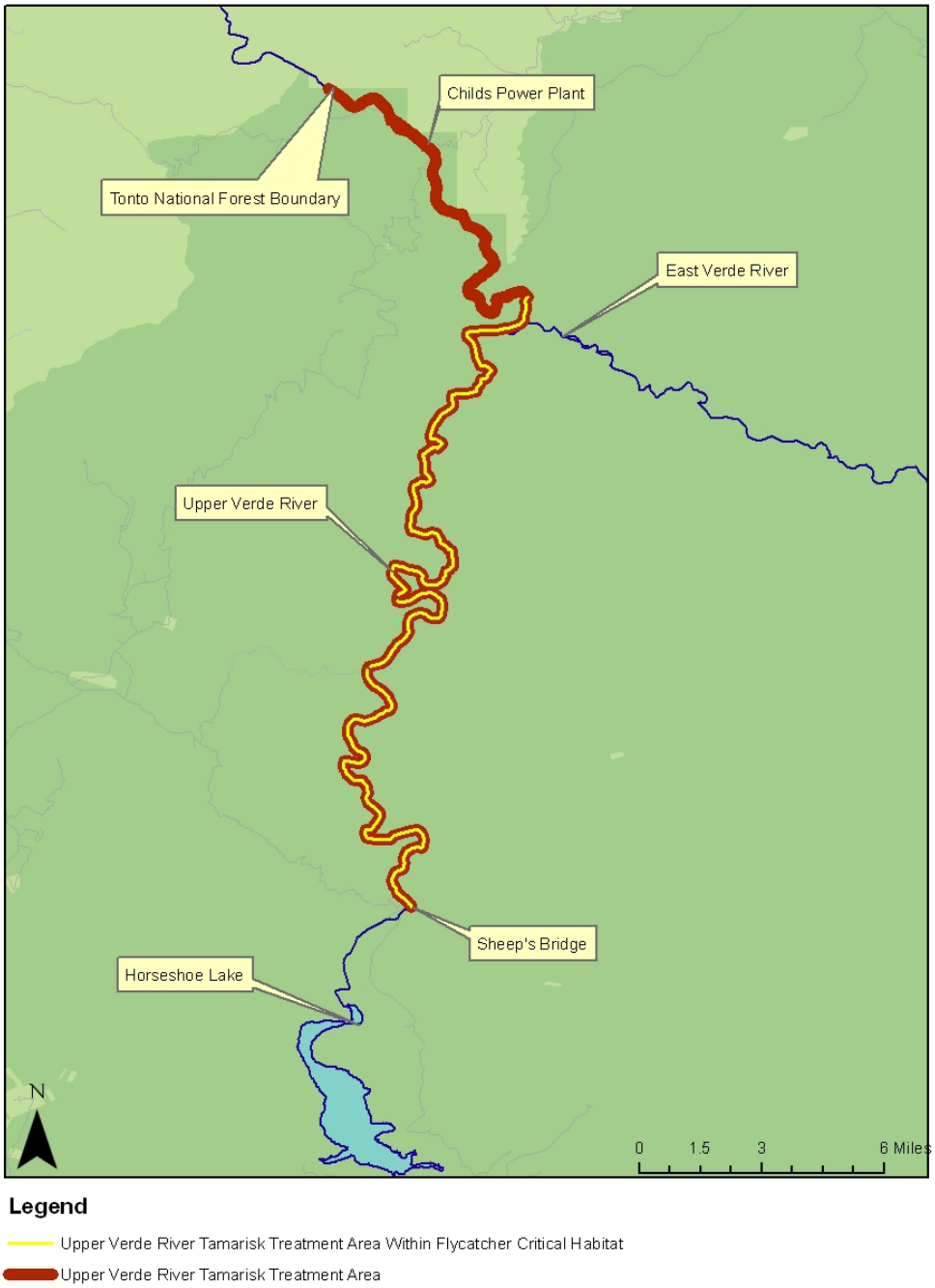

Figure 4. Upper Verde River TNF salt cedar treatment areas from the TNF boundary near Childs downstream to Sheep Bridge, Arizona.

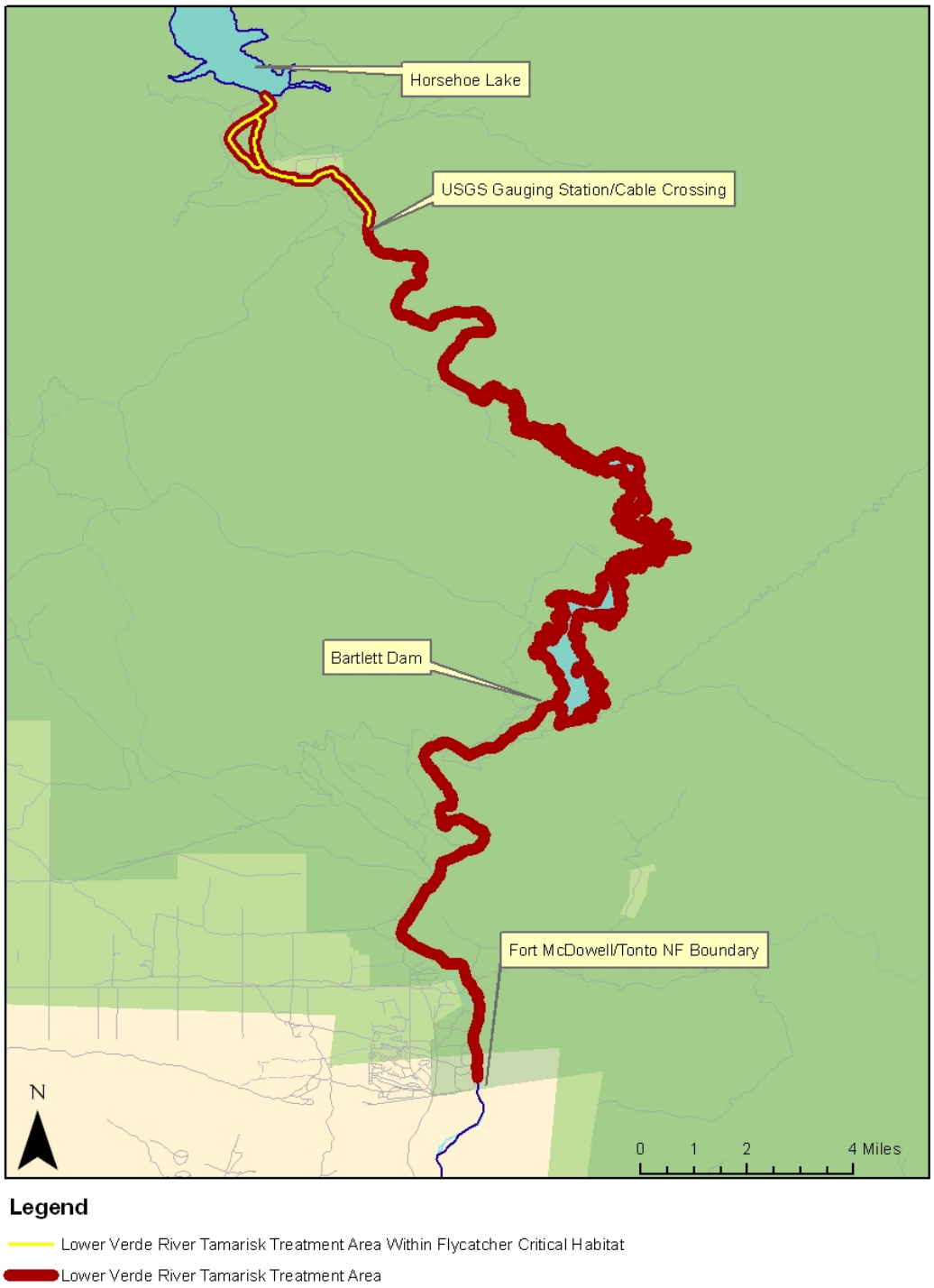

Figure 5. Lower Verde River TNF salt cedar treatment areas from the Horseshoe Dam downstream to TNF – Fort McDowell Boundary, Arizona.