



United States Department of the Interior



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In Reply Refer to:
AESO/SE
22410-2010-F-0416
02-21-05-F-0086

February 25, 2011

Memorandum

To: Field Office Manager, Safford Field Office, Bureau of Land Management, Safford, Arizona

From: Field Supervisor

Subject: Biological and Conference Opinion on the Aravaipa Canyon Saltcedar Removal

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 for formal consultation was dated June 16, 2010, and received by us on June 18, 2010. We received your request for formal conference on February 7, 2011. At issue are impacts that may result from the proposed Aravaipa Canyon Saltcedar Removal project located in Pinal and Graham counties, Arizona. The proposed action may affect loach minnow (*Tiaroga cobitis*) and its designated and proposed critical habitat, spikedace (*Meda fulgida*) and its designated and proposed critical habitat, Gila topminnow (*Poeciliopsis occidentalis occidentalis*), and desert pupfish (*Cyprinodon macularius*) and its critical habitat.

In your memorandum, you requested our concurrence that the proposed action is not likely to adversely affect southwestern willow flycatcher (*Empidonax traillii extimus*). We concur with that determination and provide our rationale in Appendix A at the end of this Biological Opinion (BO).

You also requested technical assistance on two candidate species; the yellow-billed cuckoo (*Coccyzus americanus occidentalis*) and roundtail chub (*Gila robusta*). We will provide this technical assistance under separate cover.

This biological opinion is based on information provided in the June, 2010, biological assessment, telephone conversations, field investigations, and other sources of information. Literature cited in this biological opinion is not a complete bibliography of all literature available on the species of concern,

saltcedar removal and control and its effects, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at this office.

Consultation History

- April 6, 2005. We sent you the Biological Opinion on the Effects of Existing Land Management Practices on Reestablished Populations of Gila Topminnow and Desert Pupfish in the Aravaipa Creek Watershed (02-21-04-F-0022)
- December 12, 2006. We sent you the Reinitiated Biological and Conference Opinion on the effects of the Safford Resource Management Plan (RMP BO) (02-21-05-F-0086).
- June 18, 2010. We received your memorandum, dated June 16, 2010, requesting formal consultation.
- July 13, 2010. We sent you a memorandum stating we received all the necessary information and that formal consultation had been initiated.
- February 7, 2011. We received your e-mail requesting formal conference on proposed loach minnow and spikedace critical habitat.
- February 8, 2011. We sent you the draft BO for your review and comments.
- February 16, 2011. We received your comments on the draft BO.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

Refer to the BA for more detailed information regarding the proposed action.

The Bureau of Land Management (BLM), Safford Field Office proposes to initiate a program of saltcedar removal in the Aravaipa Canyon Wilderness using mechanical and herbicidal control techniques. BLM would remove saltcedar on BLM lands along 10 miles of Aravaipa Creek and approximately 25 miles of tributaries between the east and west wilderness boundaries (see Figures). The east wilderness boundary is at the confluence of Turkey Creek and Aravaipa Creek in Graham County. The west wilderness boundary is one mile east (upstream) of the west trailhead in Pinal County (the westernmost mile of the 11-mile canyon is private land and would not be treated under this proposal).

The purpose of the proposed action is to protect the riparian environment of Aravaipa Canyon Wilderness by eradicating pockets of saltcedar that compete with native vegetation and that may increase the threat of wildfire if saltcedar increases in greater frequency.

In July and August of 2006, major flood events throughout Aravaipa Creek led to the establishment of invasive saltcedar (*Tamarix spp.*) along the main channel and some tributary canyons of Aravaipa Creek. The invasive saltcedar took advantage of the post-flood habitat conditions and became established in pockets throughout the eleven-mile wilderness canyon, but away from the water edge. Native species, notably Goodding's willow (*Salix gooddingii*), seep willow (*Baccharis salicifolia*), and

cottonwood (*Populus fremontii*), have regenerated and a new riparian canopy is forming. Surveys in 2010 identified mostly scattered or small patches of saltcedar that were five or greater feet from the water edge. An area just west of Booger Canyon is the most impacted stretch of the main canyon. It is the only stretch where saltcedar is the dominant tree. This section of the creek is estimated at no more than 1/8 mile long. Trees in this area go beyond a narrow band, but are growing 60 to 90 feet from the creek. The ground is cobble dominated in this stretch and these trees will be easily accessible to a work crew.

The program of saltcedar removal in Aravaipa Canyon would begin with signature of BLM's decision record and continue for 25 years or until superseded by other subsequent plans. Riparian systems such as that in Aravaipa Canyon are dynamic because periodic flooding events will open up small areas of bare soil to the establishment of saltcedar seedlings which often out-compete native seedlings. A long-term removal program is needed because saltcedar in the Aravaipa watershed upstream from the project area will continually provide a seed source.

The proposed action would have three concurrent phases: mechanical control activities, herbicidal control activities, and monitoring activities. Mechanical and chemical control would occur as needed throughout the year (no seasonal restrictions are proposed because critical periods would cover most of the year if considered for all fish and wildlife species in the project area). Most mechanical and chemical control would occur during normal patrols by BLM personnel, usually by a single individual, which would occur approximately twice weekly. Monitoring would occur during the normal BLM patrols of the canyon and would occur as part of the aforementioned patrols. Patrols of the canyon occur year-long.

When feasible, saltcedar would be removed by mechanical means, such as shovel and weed wrench. Mechanical removal would be done in cases when the root of the tree can be completely extracted from the ground. Mechanical removal is more likely to work with seedlings less than ½ inches in diameter and no more than 3-4 feet tall, often with looser soil. Larger plants are often too well-rooted for mechanical treatment with the means available to this project. No herbicides would be applied when mechanical removal is used. Only portable hand tools would be used, in compliance with wilderness guidelines.

The primary method of saltcedar removal would be by application of the herbicide Habitat (active ingredient: Isopropylamine salt of Imazapyr). The active ingredient is approved for aquatic use. Habitat is labeled for controlling undesirable emergent, shoreline and woody wetland aquatic vegetation in and around standing and flowing water. Habitat is a systemic herbicide that controls vegetation by affecting enzymes found only in plants, not in humans, animals, birds, fish or insects. It is readily absorbed through leaves, stems and roots and is translocated rapidly throughout plants, with accumulation in the meristematic regions. Treated plants stop growing soon after spray application. Necrosis becomes evident about two weeks after treatment. Time to death of treated saltcedar depends on size and weather conditions at application.

Most of the saltcedar is well-rooted in hard ground and can only be eliminated by herbicide treatment. Herbicide would be applied by cut stump treatment. Since most of the saltcedar in Aravaipa Canyon has appeared since 2006, the trunks are small enough to cut with portable hand tools, such as pruning saws. Herbicide would be applied directly to the freshly-cut stump, either by spraying at close range (1-3

inches) or by applying with a brush. This method minimizes the amount of herbicide used and limits the spread of the herbicide to the soil, water, or non-target plants. It also eliminates the need for an adjuvant. The cut stump treatment is very effective, inhibiting the ability of the plant to regenerate food-producing foliage. The cut stump treatment is effective at any time, though it is more effective in the fall. Application would be repeated as necessary until 100% control of saltcedar is attained.

Herbicides would be applied by BLM personnel or certified contractor. Most herbicide treatments would be done by BLM employees (usually one person) on regular patrols in the canyon. Volunteers may be used in the project to assist in finding and cutting plants, but all herbicide applications would be done by BLM employees or contractors with current certification in pesticide application. Efforts would be made to limit the size of work crews during peak periods of visitor use.

Herbicide would be used only in accordance with product labeling and Materials Safety Data Sheets (MSDS). Personal protective equipment recommendations and herbicide application procedures would be followed as directed by the labels and MSDS. Bureau of Land Management Pesticide Use Proposals (PUPs) would be approved for each herbicide and application procedure before beginning application.

BLM personnel (usually a single individual) or volunteers would monitor the canyon for saltcedar seedling/sapling establishment and control effectiveness. Informal monitoring of the success of the program would be done by BLM personnel on regular canyon patrols. New plants, or those missed on earlier trips, would be treated by certified employees on these patrols. An annual interdisciplinary monitoring trip would be scheduled to assess the effectiveness of the treatment program. Access to Aravaipa Canyon will be by foot from either the east or west trailheads.

The FWS provided BLM with recommendations for pesticide use within Region 2 of the Fish and Wildlife Service (White 2004). Many of those recommendations with respect to proposed and listed species overlap with measures being implemented as described above, although buffer zones and seasons of use were deemed infeasible for this proposed action.

Conservation Measures

The BLM will implement the following conservation measures as part of the proposed action:

- Mechanical removal, instead of chemical treatment, will be used when plants are removable with authorized tools.
- All herbicide solutions will be mixed and made ready for transport at the Safford Field Office, the Klondyke Ranger Station, or the Brandenburg Ranger Station. Herbicide would be poured into leak-proof hand-held spray bottles and carried in an additional leak-proof container. No more than 16 ounces of herbicide would be carried at any one time.
- No herbicide will be applied within the project area if wind speeds are above seven miles per hour and storm events will be avoided for herbicide application.
- If a spill occurs, product will be completely removed by digging it out (may need to remove a few inches of soil). This material will be hauled off site and disposed of properly.
- Herbicides will be applied by certified applicators directly to the freshly-cut stumps, either by

spraying at close range (1-3 inches) or by applying with a brush. This will minimize drift, and thus contamination, of the aquatic environment. Unintended application to non-target, native plants will also be minimized by such practices.

- The BLM shall provide field training in avoidance and minimization measures to all agency and contract staff that are to be operating in the field.
- The herbicide will be spot-applied at close range (1-3 inches) with a hand sprayer or brushed on the freshly cut stump.
- The water body will be avoided and treatments will be direct spot treatments. Direct spray of Habitat on water will not be conducted.
- The yearly surveys of Aravaipa Creek will continue to determine population status and trend for the fish species.

The action area consists of the project area and the extent of any effects emanating from the proposed action. Since the proposed action would attempt to eradicate saltcedar from Aravaipa Creek and its tributaries within the Aravaipa Canyon Wilderness, effects would largely be restricted to the narrow floodplain in which saltcedar occurs and the creek and floodplain downstream a short distance from the project area.

STATUS OF THE SPECIES AND CRITICAL HABITAT

Loach minnow and Spikedace

Loach minnow was listed as a threatened species on October 28, 1986 (51 FR 39468). Spikedace was listed as a threatened species on July 1, 1986 (51 FR 23769). Critical habitat was designated on March 21, 2007, for both species. For loach minnow, critical habitat designation includes portions and some tributaries of the Gila River in eastern Arizona and western New Mexico. For spikedace, critical habitat includes portions of the Verde River, the middle Gila River, the upper San Pedro River, and Aravaipa Creek in Arizona, and portions of the upper Gila River and its West, Middle and East Forks in New Mexico. Critical habitat was remanded by judge's order on May 4, 2009, back to the Fish and Wildlife Service for reconsideration (Case No. 07-CV_00876 JEC/WPL); however, the existing designation will remain in effect until critical habitat is redesignated by the FWS. Critical habitat for both species was proposed on October 28, 2010 (75 FR 66482), with a final rule due in October 2011. For Aravaipa Creek, this proposed designation overlaps the 2007 designation, which is still in place. Loach minnow is endemic to the Gila River basin of Arizona and New Mexico within the United States, and Sonora, Mexico, where it was recorded only in the Rio San Pedro. Spikedace was common throughout much of the Gila River drainage above Phoenix, Arizona, including the Gila, Verde, Agua Fria, Salt, San Pedro, and San Francisco rivers.

Loach minnow is a bottom-dwelling inhabitant of shallow, swift water over gravel, cobble, and rubble substrates (Rinne 1989, Propst and Bestgen 1991). Loach minnow uses the spaces between, and in the lee of, larger substrate for resting and spawning (Propst *et al.* 1988; Rinne 1989). It is rare or absent from habitats where fine sediments fill the interstitial spaces (Propst and Bestgen 1991). Some studies have indicated that the presence of filamentous algae may be an important component of loach minnow habitat (Barber and Minckley 1966). Loach minnow feeds exclusively on aquatic insects (Schrieber

1978, Abarca 1987). Loach minnow live two to three years with reproduction occurring primarily in the second summer of life (Minckley 1973, Sublette *et al.* 1990). Spawning occurs March through May (Britt 1982, Propst *et al.* 1988); however, under certain circumstances loach minnow also spawn in the autumn (Vives and Minckley 1990). The eggs of loach minnow are attached to the underside of a rock that forms the roof of a small cavity in the substrate on the downstream side. Limited data indicate that the male loach minnow may guard the nest during incubation (Propst *et al.* 1988, Vives and Minckley 1990).

Spikedace live in flowing water with slow to moderate velocities over sand, gravel, and cobble substrates (Propst *et al.* 1986, Rinne and Kroeger 1988). Specific habitat for this species consists of shear zones where rapid flow borders slower flow, areas of sheet flow at the upper ends of mid-channel sand/gravel bars, and eddies at the downstream riffle edges (Propst *et al.* 1986). Spikedace spawn from March through May with some yearly and geographic variation (Barber *et al.* 1970, Anderson 1978, Propst *et al.* 1986). Actual spawning has not been observed in the wild, but spawning behavior and captive studies indicate eggs are laid over gravel and cobble where they adhere to the substrate. Spikedace live about two years with reproduction occurring primarily in one-year old fish (Barber *et al.* 1970, Anderson 1978, Propst *et al.* 1986). It feeds primarily on aquatic and terrestrial insects (Schreiber 1978, Barber and Minckley 1983, Marsh *et al.* 1989).

Actions that may adversely affect the species can include road crossing construction and maintenance, livestock grazing, water withdrawals, contaminants, recreational activities, and non-native aquatic species. Our information indicates that approximately 275 consultations have been completed or are underway for actions affecting spikedace and loach minnow. The majority of these opinions concerned the effects of grazing, roads and bridges, or agency planning. Additional consultations dealt with timber harvest, fire, flooding, recreation, realty, animal stocking, water development, recovery (including loach minnow and spikedace reintroduction efforts), and water quality issues.

The status of loach minnow and spikedace are declining rangewide. Although they are currently listed as threatened, the FWS determined in 1994 that a petition to uplist the species to endangered status is warranted (59 FR 35303). The FWS confirmed this decision in 2000 (65 FR 24328). Reclassification to endangered was proposed on October 28, 2010 (75 FR 66482), with a final decision due in October 2011.

Critical Habitat

In the 2007 designation, critical habitat was designated in four separate complexes for loach minnow, including the Black River Complex, the Middle Gila/Lower San Pedro/Aravaipa Creek Complex, the San Francisco/Blue River Complex, and the Upper Gila River Complex. Critical habitat was designated in three separate complexes for spikedace, including the Verde River Complex; the Middle Gila/Lower San Pedro/Aravaipa Creek Complex, and the Upper Gila River Complex (New Mexico), including the West, Middle, and East Forks of the Gila River. Critical habitat for each species was further delineated into critical habitat units, which were based on sufficient primary constituent elements (PCEs) being present to support one or more of the species' life history functions. Some units contain all PCEs and support multiple life processes, while some units contain only a portion of the PCEs necessary to support the species' particular use of that habitat. Where a subset of the PCEs was present at the time of

designation, the critical habitat rule protects those PCEs and thus the conservation function of the habitat. The general descriptions of the PCEs are:

- Permanent, flowing water with no or minimal levels of pollutants.
- Sand, gravel, and cobble substrates with low or moderate amounts of fine sediment and substrate embeddedness.
- Streams that have low gradients, appropriate water temperatures, pool, riffle, run, and backwater components, and abundant aquatic food base.
- Habitat devoid of non-native aquatic species or habitat in which non-native aquatic species are at levels that allows persistence of loach minnow and spikedace.
- Areas within perennial, interrupted stream courses that are periodically dewatered but that serve as connective corridors between occupied or seasonally occupied habitat and through which the species may move when the habitat is wetted.

Refer to the federal register notice for specific information about designated loach minnow and spikedace critical habitat (FRN 72(54):13356), and the BA for additional information on loach minnow and spikedace status.

The 2010 proposed critical habitat designation describes critical habitat in various subbasins. For both spikedace and loach minnow, the eight subbasins designated include the Verde River, the Salt River, the San Pedro River, Bonita Creek, Eagle Creek, the San Francisco River, the Blue River, and the Gila River. Aravaipa Creek is included within the San Pedro River subbasin.

Similar to the 2007 designation, critical habitat for each species was further delineated into critical habitat units within each of the subbasins. Suitable units were defined by either the presence of physical and biological features (PBFs) (similar to primary constituent elements used in 2007), or, if unoccupied, by their value to the conservation of the species. In areas that were not known to be occupied at listing, but that either expand available habitat within the subunit, or that would allow for the expansion of the geographic distribution of either species across their historical range, we determined these areas were essential to the conservation of the species. In areas that were determined to be occupied, PBFs are described. Some units contain all PBFs and support multiple life processes, while some units contain only a portion of the PBFs necessary to support the species' particular use of that habitat. Where a subset of the PBFs was present at the time of designation, the critical habitat rule protects those PBFs and thus the conservation function of the habitat. The general descriptions of the PBFs are:

- Shallow water generally less than 1 m (3.3 ft) in depth;
- Slow to swift flow velocities between 5 and 80 cm per second (sec) (1.9 and 31.5 in. per sec) for spikedace and 0 and 80 cm per sec (0.0 and 31.5 in. per sec) for loach minnow;
- Glides, runs, riffles, the margins of pools and eddies, and backwater components for spikedace, and pools, runs, riffles, and rapids for loach minnow;

- Sand, gravel, and cobble substrates with low or moderate amounts of fine sediment and substrate embeddedness, as maintained by a natural, unregulated flow regime that allows for periodic flooding or, if flows are modified or regulated, a flow regime that allows for adequate river functions, such as flows capable of transporting sediments;
- Low gradients of less than approximately one percent for spikedace, and approximately 2.5 percent for loach minnow;
- Water temperatures in the general range of 8 to 28 °C (46.4 to 82.4 °F) for spikedace, and 8 to 25 °C (46.4 to 77 °F) for loach minnow; and
- Elevations below 2,100 m (6,890 ft) for spikedace and 2,500 m (8,202 ft) for loach minnow.

Gila topminnow

Gila topminnow was listed as endangered in 1967 without critical habitat (32 FR 4001). Only Gila topminnow populations in the United States, and not in Mexico, are listed under the ESA. The reasons for decline of this fish include past dewatering of rivers, springs and marshlands; impoundment, channelization, diversion, and regulation of flow; land management practices that promote erosion and arroyo formation; and the introduction of predacious and competing non-indigenous fishes (Miller 1961). Other listed fish suffer from the same impacts (Moyle and Williams 1990). Life history information can be found in the 1984 recovery plan (U.S. Fish and Wildlife Service 1984), the draft revised Gila topminnow recovery plan (Weedman 1999), and references cited in the plans.

The status of Gila topminnow has changed little since our February 11, 2008, Intra-Service Biological and Conference Opinion on Issuance of an Enhancement of Survival Permit (TE-083686-0) to the AGFD (file number 22410-2003-F-0022). We hereby incorporate by reference the Status of the Species section of that biological opinion. For additional information about the Gila topminnow see the previously listed citations and Voeltz and Bettaso (2003). Our records indicate that, rangewide, 72 formal conferences or consultations have been completed for actions affecting Gila topminnow.

Desert pupfish

The desert pupfish was listed as an endangered species with critical habitat in 1986 (51 FR 10842). Historical distribution of desert pupfish in Arizona included the Gila, San Pedro, Salt, and Santa Cruz rivers, and likely the Hassayampa, Verde, and Aqua Fria rivers, although collections are lacking for the latter three. The desert pupfish is also found in the Lower Colorado River, Rio Sonoyta basin, Salton Sink basin, and Laguna Salada basin (Eigenmann and Eigenmann 1888, Garman 1895, Gilbert and Scofield 1898, Evermann 1916, Miller 1943, Minckley 1980, Black 1980, Turner 1983, Miller and Fuiman 1987).

One or more threats imperil most natural and transplanted populations. Since the 19th century, desert pupfish habitat has been steadily altered by stream bank erosion, the construction of water impoundments that dewatered downstream habitat, excessive groundwater pumping, the application of pesticides to nearby agricultural areas, and the introduction of non-native fish species. The non-native bullfrog occurs in parts of the desert pupfish's range. It is an opportunistic omnivore with a diet that

includes fish. Introduced salt cedar (*Tamarix* spp.) next to pupfish habitat may cause a lack of water at critical times. Introduced salt cedar (*Tamarisk* spp.) growing adjacent to desert pupfish habitat might cause a lack of water at critical times; however, recent scientific information contradicts the long-held belief that tamarisk consumes more water than native trees. The remaining populations continue to face these threats, and the Salton Sea area populations, in particular, are severely threatened. The entire range of the species in Arizona is covered by a Safe Harbor Agreement, which we anticipate will facilitate establishment of populations on non-Federal lands.

Additional life history information can be found in the recovery plan (U.S. Fish and Wildlife Service 1993) and other references cited there. Our records indicate that in Arizona, 37 formal conferences or consultations have been completed for actions affecting desert pupfish.

Critical Habitat

Critical habitat was designated for the desert pupfish at Quitobaquito Spring, Organ Pipe Cactus National Monument, and Pima County, Arizona; and along portions of San Felipe Creek, Carrizo Wash, and Fish Creek Wash, Imperial County, California. These areas provide the PCEs necessary to maintain pupfish, including adequate food and cover, and at Quitobaquito Spring are at least partially isolated from predatory and competing exotic fishes.

ENVIRONMENTAL BASELINE

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

Description of the Action Area

The Action Area consists of the project area, described above, and the extent of any effects emanating from the proposed action. Since the proposed action would attempt to eradicate saltcedar from Aravaipa Creek and its tributaries within the Aravaipa Canyon Wilderness, effects would largely be restricted to the narrow floodplain in which saltcedar occurs, the creek, and floodplain no more than a mile downstream of the western wilderness boundary, corresponding with the West Trailhead.

A. Status of the species and critical habitat within the action area

Loach Minnow and Spikedace

Aravaipa Canyon supports the most protected loach minnow and spikedace populations due to special use designations on BLM land (such as wilderness designation), substantial ownership and protective management by The Nature Conservancy, and ephemeral reaches and fish barriers located downstream that act to prevent invasion of non-native fish species. Loach minnow are found in Aravaipa Creek from the downstream non-native fish barriers upstream to above Turkey Creek, in Deer Creek upstream from

its confluence with Aravaipa Creek to the Aravaipa Canyon Wilderness boundary, and occasionally in the lower most segment of Turkey Creek next to its confluence with Aravaipa Creek. Spikedace are found from the midpoint of the canyon at Horse Camp Wash upstream to above Turkey Creek. It is believed that spikedace occurred throughout the canyon at one time, but have been virtually absent from the lower reaches of Aravaipa Canyon since the 1970s, mainly due to low or no water flows. Spikedace numbers have increased in the upper reaches of Aravaipa Canyon as a result of aquatic habitat improvement. Intensive monitoring has demonstrated that loach minnow and spikedace persist in the Aravaipa Creek area, and the populations are likely stable. River and riparian habitat along Aravaipa Creek and Deer Creek areas provide high quality loach minnow and spikedace habitat. There is a risk from non-native fish invading the canyon, especially red shiner, and from livestock waters located in the uplands either adjacent to or in tributary canyons that drain into Aravaipa that may harbor non-native aquatic organisms. Aravaipa Creek maintains a self-sustaining population of loach minnow and spikedace that varies in number from year to year. The status of the Deer Creek loach minnow population, discovered in 1995, is unknown.

Critical Habitat

In the action area, loach minnow critical habitat has been designated (and proposed) in Aravaipa Creek (11 miles), Turkey Creek extending from the confluence with Aravaipa Creek upstream to the confluence with Oak Grove Canyon (approximately 3 miles), and Deer Creek extending from the confluence with Aravaipa Creek upstream to the boundary of the Aravaipa Wilderness (approximately 2 miles). Aravaipa and Deer creeks, which are occupied by loach minnow, apparently have one or more of the PCEs/PBFs that are sufficient to maintain the species. Turkey Creek may maintain most PCEs/PBFs for loach minnow, but low or no water flows through part of most years may limit loach minnow presence. Aravaipa Creek similarly contains one or more of the PCEs/PBFs for spikedace, while Deer and Turkey Creek were determined in the 2010 proposed rule to be essential to the conservation of the species.

Recovery and Critical Habitat Management

The recovery plans did not specifically identify mechanical or chemical control of plants or their application as factors affecting these species. In general, changes in vegetation are addressed, which could result from mechanical or chemical use. The only recovery objective related to the proposed action is to discourage detrimental land and water use practices. The listing (72 FR 13391) lists the actions that may destroy or adversely modify critical habitat. The listing identifies that the release of chemical or biological pollutants into the surface water or connected groundwater at a point source or by dispersed release (non-point source) could alter water chemistry. While mechanical or chemical control is not specifically addressed, the effects from such action could affect riparian vegetation. Critical habitat managed to maintain or improve the PCEs for loach minnow or spikedace over time will maintain or improve these characteristics.

Gila Topminnow and Desert Pupfish

We anticipate that desert pupfish and Gila topminnow will occur in Aravaipa Creek, Turkey Creek, or other tributaries of Aravaipa Creek during the life of this proposed action because high water flows during storms may move the fish downstream to Aravaipa and Turkey creeks, and provide access to

other tributaries. Parson's Grove was stocked in October 2005 with desert pupfish and Gila topminnow, along with additional sites on TNC property. Follow-up surveys conducted by the BLM and The Nature Conservancy (TNC) have failed to collect desert pupfish; however, Gila topminnow appear to be doing well and are reproducing. Stocking in future years will continue in other suitable sites in the general area, along with supplemental stockings in the recently stocked sites to establish and maintain genetic integrity of these small populations. Formal consultation was completed for these establishments on BLM and TNC land in the Aravaipa Creek Watershed reestablishment BO (#02-21-04-F-0022).

Critical Habitat

Critical habitat has not been designated for Gila topminnow. No desert pupfish designated critical habitat occurs within the action area.

B. Factors affecting species environment and critical habitat within the action area

All species

The action area has been and continues to be adversely affected by natural events, such as fire, flood, or drought, and from non-native species invasions, recreation activities, up-stream water withdrawal and improper livestock grazing, and/or other land-use practices on public and private lands. Past and current actions in the action area may result in some adverse effects to the species, but the action area will likely maintain favorable conditions in Aravaipa Creek and its tributaries in the long-term. The RMP BO addressed all BLM actions in the Aravaipa Creek area, including recreation and other uses.

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.

All Species

Effects of the proposed action on the fish could occur from activities related to the three phases of the project: mechanical control activities, herbicidal control activities, and human access to implement control and monitoring activities.

Mechanical Control

Because the distribution of saltcedar in Aravaipa is away from water's edge, mechanical activities such as pulling plants or digging out roots will have minor effects to individuals or their habitat. Disturbance to soil may result in more indirect deposition into adjacent waters during rainfall events, but this will be temporary and not measurable to fish habitat. Native vegetation is anticipated to establish quickly in these areas, as evidenced by vegetation regrowth following flood events, and would return soil stability to pre-treatment conditions.

Herbicidal Control

Similar effects to that described above for mechanical control are anticipated through the cutting of saltcedar before application of herbicide.

The use of herbicide will have few to no effects to the fish or their habitat.

Habitat (Imazapyr), is labeled as safe for aquatic use in fish habitat because it is considered to have low toxicity to fish and invertebrates (e.g., Imazapyr has recently been shown to have no effect on metabolic functions of Chinook salmon (*O. tshawytscha*), even at high concentrations). White (2004) rated Habitat (Imazapyr) as a Class 0 herbicide, meaning that implementing buffers and other measures were not necessary if applied correctly. Because application of the herbicide will occur away from the water's edge and in such a way as to eliminate or minimize drift, it is highly unlikely that even trace amounts of herbicide could enter the water upon application. In the event of a spill in water, Imazapyr would also have a negligible effect because it would be almost immediately be diluted and would disperse.

Given that the herbicide will be applied directly to the vegetation using the cut stump method rather than using a broadcast spray method, imazapyr is not likely to reach the soil when used properly. If Imazapyr were to be spilled onto the ground, however, its persistence in the soil may impact non-target vegetation and may limit establishment of native vegetation at the spill. These effects would be small because of the volume of herbicide being used (less than sixteen ounces would be in Aravaipa Canyon at any one time) and that the BLM will remove the affected soil.

Refer to the BA and to the Proposed Tamarisk Control and Selective Mesquite Removal Project within the Gila Box Riparian National Conservation Area biological opinion (#02-21-05-F-0727) for more detailed information on the toxicity of Imazapyr and its effects to resources.

Based on these findings, there would no or few effects of Imazapyr, when applied according to the label, MSDS, and the proposed action, on loach minnow, spikedace, Gila topminnow, and desert pupfish, and these effects would not occur unless there is a spill.

Access to Implement Control and Monitoring Activities

Adverse effects to some individuals may occur from accessing treatment sites and patrol and monitoring activities. Searching for saltcedar would mean searching a variety of habitats and crossing the creek frequently. Adult and subadult fish exhibit startle and escape behaviors when presented with large mammals treading through their habitat. Such behaviors are common with all kinds of potential threats the fish are faced with on a daily basis. Because of the very short transitory nature of these activities, fish breeding, feeding, or sheltering activities are not expected to be disrupted in any measurable fashion from personnel accessing project sites, patrols, and monitoring. Egg and larval stages may be adversely affected by personnel accessing treatment sites and conducting patrol and monitoring activities. These actions may result in disturbance and/or death of eggs or larvae through trampling or siltation (by dislodging fine sediments) from (depending on species) late winter (February) through the end of November. These effects, if they occur, would be small in area and intermittent so that effects to reproduction would be small and not measurable for the population. We expect these effects to occur for loach minnow and spikedace, though at low levels. These effects are unlikely for desert pupfish because none currently exist in the project area, and if they do in the future, areas that are occupied by

their eggs or larvae will be very few. During the remainder of the year such effects would be extremely unlikely as eggs would not be present and larvae would be more mobile or would have transformed to the juvenile size class. Effects to eggs or larvae for Gila topminnow will not occur because they are a live-bearing species. Any changes to habitat would be small and temporary, and conditions would soon return to pre-implementation conditions. All these effects are also addressed in the RMP BO.

Loach minnow and spinedace critical habitat

The proposed action may affect PCEs or PBFs related to water quality or substrate condition. As described for effects to habitat above, these effects would be confined to small areas, and would be intermittent and temporary. Pre-implementation conditions would soon return, with no long-term changes anticipated.

Recovery and Critical Habitat Management

The recovery potential of critical habitat will not be compromised by the proposed action. As stated in the previous section, the effects to the PCEs or PBFs from mechanical and chemical treatment, and accessing the saltcedar, will be small, intermittent, and temporary, and return to pre-implementation conditions. Implementation of the proposed action is expected to result in the perpetuation of loach minnow and spinedace populations in the action area. Critical habitat will be managed to maintain or improve the PCEs or PBFs for loach minnow and spinedace over time, contributing to recovery.

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.

Human development, recreational site encroachment, and changes in land-use patterns on non-Federal lands around occupied and potentially-occupied reaches of Aravaipa Creek that further fragment, modify, or destroy upland or riparian vegetation negatively affect water quality and quantity. Increased development and continuation of agricultural and livestock grazing practices may result in the drainage, development, or diversions of wetland and aquatic habitats that reduce water quantity and quality, and destroy spawning and other important habitats. If additional bait-bucket or other introductions of non-native fishes occur in occupied reaches of Aravaipa or Turkey creeks, increased resource competition and direct mortality from predation would likely result.

Farming and ranching activities occur in the east and west portions of Aravaipa Creek and in the uplands, on private, federal, and state lands. Groundwater pumping, surface water diversions, agricultural return flows, flood control activities, and channelization projects could potentially alter flows through the project area, which would affect both aquatic and terrestrial species and their habitats. In addition, recreational activities including hiking, hunting, picnicking, birding, horseback riding, primitive camping, off-highway vehicle driving, geocaching, will continue and may increase. Increase in recreation may have additive impacts to the species and their habitats.

Recently, concerns regarding lead from mine tailings in the area have been discussed. Lead from two mine tailings have been deposited in the general area, either wind driven or through precipitation runoff. This has been occurring for many decades, but the flooding in summer 2006 raised concerns about direct movement of lead from a mine tailing along Aravaipa Creek. Current levels of lead in the system have not seemed to limit population persistence or levels, but sampling of the aquatic system is occurring to monitor the effects of lead levels.

CONCLUSION

After reviewing the current status of each species and its critical habitat, the environmental baseline for the action area, the effects of the proposed Aravaipa Canyon Saltcedar Removal and the cumulative effects, it is the FWS's biological opinion that the proposed action is not likely to jeopardize the continued existence of the loach minnow, spikedace, Gila topminnow, or desert pupfish, is not likely to destroy or adversely modify designated critical habitat for loach minnow, spikedace, or desert pupfish, and is not likely to destroy or adversely modify proposed critical habitat for loach minnow or spikedace. We base these conclusions on the following reasons:

1. Effects to individuals from implementation will be small and intermittent. Most adults mostly will avoid the disturbances. Some eggs and larvae may be affected, but these will be small, intermittent, and not measurable for reproduction.
2. Effects to habitat from implementation will be restricted to small areas and be intermittent. Conditions will return to pre-implementation conditions.
3. Effects to loach minnow and spikedace designated and proposed critical habitat will be small, intermittent, and temporary. The recovery potential of the critical habitat in the action area will not be compromised.
4. No critical habitat for Gila topminnow has been designated, so none will be affected.
5. No critical habitat for desert pupfish occurs in the action area, so none will be affected.

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 statutory provisions of the Act to complete the following analysis with respect to critical habitat.

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

INCIDENTAL TAKE STATEMENT

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

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

Loach Minnow and Spikedace

AMOUNT OR EXTENT OF TAKE

We anticipate that the proposed action may result in the incidental take of the loach minnow and spikedace by injuring or killing eggs or larvae through personnel accessing areas for treating saltcedar and monitoring. This would mean searching a variety of habitats and crossing the creek frequently. We anticipate incidental take of loach minnow and spikedace will be difficult and unlikely to detect or determine for the following reasons: destroyed eggs and larvae are difficult to find, occupied habitats are located within remote wilderness, cause of death may be difficult to determine, losses may be masked by seasonal fluctuations, and other actions (such as recreational hiking) are affecting the species. Based upon long-term, intensive surveys conducted every year, loach minnow and spikedace populations persist and appear to be stable within Aravaipa Canyon even with all the uses within the Canyon, including recreational hiking (see RMP BO). We expect that implementing this proposed action will not affect the ability of loach minnow and spikedace populations to continue to persist and be stable. The amount of anticipated incidental take will be considered to have been exceeded if the continued yearly monitoring of Aravaipa Creek native fish population trends show decreases that cannot be explained by other factors (e.g., floods, recreation) and the proposed action has been implemented for a sufficient time to influence such trends.

EFFECT OF THE TAKE

In this biological opinion, the FWS determines that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat for the reasons stated in the Conclusions section.

REASONABLE AND PRUDENT MEASURES and TERMS AND CONDITIONS

There are no reasonable and prudent measures or terms and conditions beyond the conservation measures in this BO that will further reduce effects to loach minnow and spikedace. The conservation measure to continue surveying Aravaipa Creek will provide the population information necessary to determine if take is exceeded. No additional reasonable and prudent measures in addition to the conservation measures in this BO are necessary to minimize incidental take.

Gila Topminnow and Desert Pupfish

AMOUNT OR EXTENT OF TAKE

The FWS does not anticipate the proposed action will incidentally take any Gila topminnow or desert pupfish for the following reasons:

- No Gila topminnow or desert pupfish are known to currently occur in the project area.
- If Gila topminnow move into the project area in the future, there will be little to no effect to individuals because topminnow are a live-bearing species.
- If desert pupfish move into the project area in the future, areas where eggs or larvae occur will be very few so that the likelihood that the proposed action will affect any eggs or larvae will be very low.

Review requirement: The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. If, during the course of the action, the level of incidental take is exceeded, such incidental take would represent new information requiring review of the reasonable and prudent measures provided. The BLM must immediately provide an explanation of the causes of the taking and review with the AESO the need for possible modification of the reasonable and prudent measures.

Disposition of Dead or Injured Listed Species

Upon locating a dead, injured, or sick listed species initial notification must be made to the FWS's Law Enforcement Office, 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 care, and in handling dead specimens to preserve the biological material in the best possible state.

CONSERVATION RECOMMENDATIONS

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

1. We recommend that BLM coordinate with AGFD and FWS in efforts to work with private landowners upstream of known locations to eradicate any source populations of non-native aquatic species from their lands.
2. We recommend that BLM collect flow data to apply for instream flow rights with the Arizona Department of Water Resources in occupied fish sites, if such rights have not been previously obtained.
3. We recommend that the BLM keep accurate records as to the successes and complications encountered with stocking efforts. These records will assist others in future stocking efforts.
4. We recommend that the BLM work with FWS on developing, if necessary, and implementing the recovery plan for each fish, and assist in establishing additional populations.
5. We recommend that the BLM coordinate with other land managers and landowners to develop cooperative projects to improve watershed conditions.

In order for the FWS to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the FWS requests notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes the conference for loach minnow and spikedace proposed critical habitat. You may ask the FWS to confirm the conference opinion as a biological opinion issued through formal consultation if the proposed critical habitat is designated. The request must be in writing. If the FWS reviews the proposed action and finds there have been no significant changes in the action as planned or in the information used during the conference, the FWS will confirm the conference opinion as the biological opinion for the project and no further section 7 consultation will be necessary.

After designation of critical habitat and any subsequent adoption of this conference opinion, the BLM 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 concludes formal consultation on the actions outlined in the request for the Aravaipa Canyon Saltcedar Removal. 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 BLMs efforts to identify and minimize effects to listed species from this project. For further information please contact Mark Crites (520) 670-6150 (229) or Scott Richardson (242). Please refer to the consultation number 22410-2010-F-0416 in future correspondence concerning this project.



for Steven L. Spangle

cc (hard copy):

Field Supervisor, Fish and Wildlife Service, Phoenix, AZ (2)
Assistant Field Supervisor, Fish and Wildlife Service, Tucson, AZ
Fish and Wildlife Service, Tucson, AZ (Attn: Mark Crites)

cc (electronic copy):

State Director, Bureau of Land Management, Phoenix, AZ
Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ
Regional Supervisor, Arizona Game and Fish Department, Tucson, AZ

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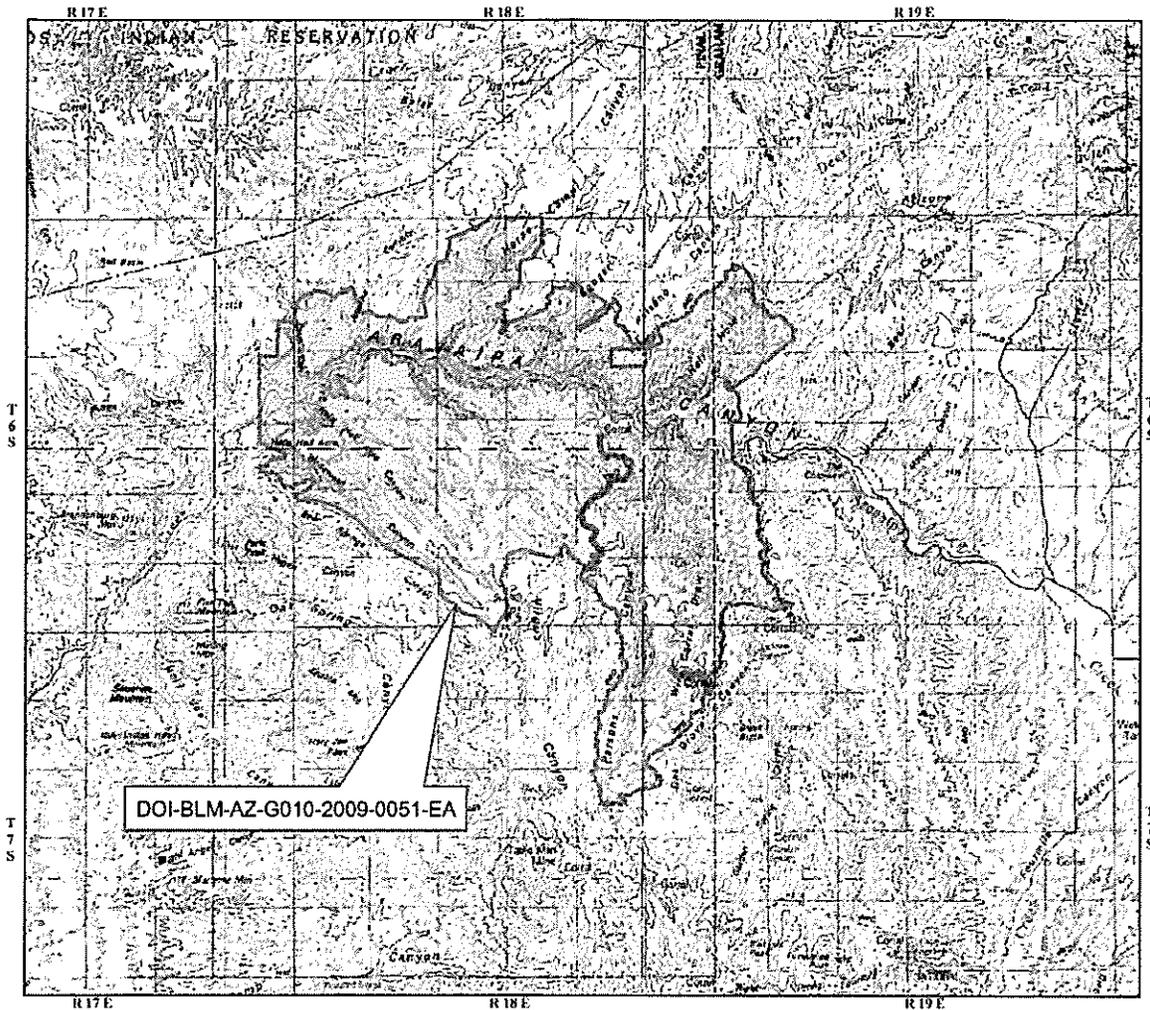
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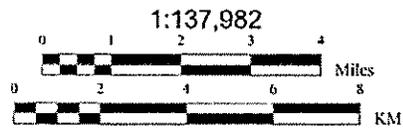
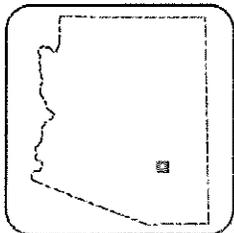
TABLES AND FIGURES

Figure 1. Aravaipa Canyon Saltcedar Removal Area, BLM Safford Field Office



Legend

- | | | | |
|---------------------------|---|--------------------------------|--|
| Private Lands | Bureau of Land Management (BLM) | BLM Wilderness Area | BLM National Monument |
| State Lands | National Forest Lands (USFS) | Forest Service Wilderness Area | National Conservation Area |
| State Wildlife Area | National Park Service (NPS) | NPS Wilderness Area | Military Reservations/Corps of Engineers |
| City, State, County Parks | USFW Service, National Wildlife Refuges | USFW Service Wilderness Area | Bureau of Reclamation (BOR) |
| County Lands | Indian Lands or Reservations | | |



 United States Department of the Interior
Bureau of Land Management
Arizona State Office
Map created on Dec 07, 2009



CAUTION
and other data is derived from 10x or smaller scale data than the 1:100,000 scale used
map. Therefore, land ownership may not be shown for parts of smaller scale maps, and
and ownership lines may have plotting errors due to scale effects.

No warranty is made by the Bureau of Land Management
for the use of the data for purposes not intended by the BLM.

Appendix A: Concurrences

Southwestern Willow Flycatcher

The action area does not contain southwestern willow flycatcher (flycatcher) breeding habitat. The action area may provide migration habitat for the flycatcher during the late spring and summer months. We concur with your determination that the proposed action may affect, but is not likely to adversely affect, the flycatcher based on the following reasons:

- Breeding flycatchers will not be affected because no breeding habitat occurs in the action area.
- The proposed action could momentarily disturb an individual flycatcher moving through the area during migration, but they would quickly return to their normal activities. This disturbance is unlikely to occur because implementation of the proposed action would occur intermittently and flycatcher migratory use would only occur occasionally.
- Implementation of the proposed action outside the migratory season would result in no effects to individual flycatchers.
- The proposed action would likely result in no effect to migration habitat from removing or treating salt cedar. Salt cedar provides migratory habitat, but the native plants that may establish because of the treatment also provide migratory habitat.
- There is no flycatcher critical habitat within the action area.