



United States Department of the Interior

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In Reply Refer To:

AESO/SE

2-21-98-F-266R2

November 29, 2000

John A. Ruble
Director, Installation Support
US Army Intelligence Center and Fort Huachuca
Fort Huachuca, Arizona 85613-6000

Dear M. Ruble:

This letter is in response to your request for reinitiation of consultation on the Fort Huachuca Programmatic biological opinion, pursuant to section 7 of the Endangered Species Act (16 U.S.C. 1531-1544), as amended. Your request was dated September 8, 2000, and received in this office September 12, 2000. In that letter, you requested reinitiation of consultation in regard to recent designation of critical habitat for spikedace (*Meda fulgida*) and loach minnow (*Tiaroga cobitis*), and proposed designation of critical habitat for the Mexican spotted owl (*Strix occidentalis lucida*). The proposed action evaluated under this reinitiation is the same as described in the Fish and Wildlife Service's (Service) October 27, 1999, programmatic biological opinion, except that the Fort's unmanned aerial vehicle (UAV) program has been modified, and an East Range Effluent Reuse Project has been proposed. Concurrences with determinations that the proposed action may affect, but is not likely to adversely affect, listed species and critical habitat are addressed in Appendix 1 of this reinitiated biological opinion.

Consultation History

The consultation histories in the Services' October 27, 1999, programmatic biological opinion, and the first reinitiation of consultation (letter dated September 29, 2000 - 2-21-98-F-299R1) are amended to include the following.

In a letter dated August 30, 2000, Fort Huachuca requested reinitiation of consultation in regard to effects of a revised proposed action, which included several changes in the unmanned aerial vehicle (UAV) program, on listed species and critical habitat. Revisions to the proposed action were needed to provide infrastructural and operational capabilities to support anticipated incremental changes to UAV mission requirements at Fort Huachuca. We responded in a reinitiated biological opinion dated September 29, 2000, that the revised proposed action is not likely to jeopardize the continued existence of the Huachuca water umbel (*Lilaeopsis schaffneriana* var. *recurva*); southwestern willow flycatcher (*Empidonax traillii extimus*); Mexican spotted owl (*Strix occidentalis lucida*); lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*); and Sonora tiger salamander (*Ambystoma tigrinum stebbinsi*); was not likely to adversely affect spikedace, loach minnow, Canelo Hills ladies' tresses (*Spiranthes delitescens*);

and was not likely to result in destruction or adverse modification of critical habitat designated for the southwestern willow flycatcher, Huachuca water umbel, spikedace, and loach minnow, and proposed for the Mexican spotted owl. In our reinitiated biological opinion, we addressed critical habitat designated for the spikedace and loach minnow, although your request for reinitiation of consultation in regard to that critical habitat was contained in your September 12, 2000, letter rather than the August 30, 2000, letter. In our September 29, 2000, letter, we stated that other requests in your September 12, 2000, letter would be addressed in subsequent correspondence. Herein, we address effects of the proposed action on listed species and critical habitat, and proposed critical habitat for the Mexican spotted owl, in regard to a modified proposed action that includes the proposed East Range Effluent Reuse Project.

Revision of the Proposed Action

The reader should refer to the October 27, 1999, biological opinion, and the September 29, 2000, first reinitiation of consultation, for a description of the original proposed action. Herein we add the following element to the proposed action:

East Range Effluent Reuse Project

The East Range Effluent Reuse Project consists of two components: 1) modifications to Fort Huachuca's wastewater treatment plant (WWTP) for the purpose of improving the quality of treated effluent for recharge, and 2) construction of effluent and stormwater recharge basins to increase recharge of the aquifer.

WWTP Modifications

The WWTP treats an average of 1.1 million gallons per day or 1,232 acre-feet per year of domestic sewage from Fort Huachuca with flows varying daily and seasonally from almost nil during the early morning hours to over six million gallons per day during a storm event. Up to 90 percent of the treated effluent is used during the summer months for irrigating the golf course and Chaffee Parade Grounds whereas demand falls to less than five percent during the winter months. The total annual demand for treated effluent is approximately 500 acre-feet.

Modifications to the treatment plant include installation of an oxidation ditch to replace the existing trickling filter. The oxidation ditch will reduce total nitrogen levels in plant effluent to meet current Aquifer Water Quality Standards.

Effluent and Stormwater Recharge Basins

The East Range Effluent Reuse System consists of a total of seven effluent recharge basins (referred to as basins E1 through E7) and 2 stormwater recharge basins (referred to as SW-1 and SW-2). In addition, SW-1 will be configured to allow treated effluent to be diverted to it for recharge. The basins are located in the East Range Lagoons area; an area consisting of a series of existing effluent evaporation basins located in an unnamed wash which drains northeast into Soldier Wash. The existing basins were constructed for the purpose of evaporating treated effluent from Fort Huachuca's WWTP. Siting the effluent recharge basins in this area has two advantages: a) alluvial material found in ephemeral washes is generally more permeable than

surrounding soils, and b) existing berms associated with the effluent evaporation basins will be incorporated where possible into the effluent recharge basins resulting in construction cost savings.

The effluent recharge basins, except for E1, will be operated in a wet-dry mode, meaning the basins will be inundated then allowed to dry out between inundation cycles. The drying cycle enhances infiltration by minimizing the formation of algae and promoting the development of cracks in basin floors. The design calls for allowing the basins to dry out for an amount of time equal to that required for effluent infiltration (i.e., wet-dry cycle ratio of 1:1). Effluent recharge basin E1 will be continuously wetted acting as a reservoir for treated effluent. Effluent will be distributed by gravity to basins E2 through E7 through an outlet structure in E1 or alternatively, effluent can be diverted directly to each basin through the outlet structure of E1. Effluent will enter each basin through inlet valves which can be controlled remotely at the WWTP. Flow from E1's outlet structure and the water level in E1 will be monitored remotely at the WWTP. The current design does not include provisions for monitoring flow and water height in basins E2 through E7. In order to operate the basins remotely, automated water level instrumentation will need to be installed.

Design parameters for sizing effluent recharge basins included the average daily flow (i.e., 1.1 million gallons per day) from the WWTP with some capacity to accommodate additional flows from off-post sources, and the estimated infiltrations rates determined from field studies. Infiltration rates were determined using a cylinder infiltrometer test at 14 locations and performing a large-scale infiltration test at a single location. Infiltration rates varied significantly for basins E2 through E7, but were conservatively estimated to be six inches per day for design purposes. If we assume that basins will be initially filled to a depth of 24-inches, then basins will be wetted and dried on a four day cycle. The total basin bottom surface area of E2 through E7 is 10.5 acres which means that combined, these basins have the capacity to recharge approximately five acre-feet per day when wetted. Using the above-mentioned 1:1 wet-dry cycle ratio and an annual potential evaporation rate of five feet per year, E2 through E7 have the capacity to recharge approximately 895 acre-feet per year. Basin E1 has a bottom surface area of approximately 7.9 acres with an estimated infiltration rate of 0.1 feet per day. This means that E1 has the capacity to recharge approximately 283 acre-feet per year, assuming it remains continuously wetted. The above estimates do not include downtime for basin maintenance activities (i.e., periodic cleaning to remove fines). In addition, it is highly unlikely that actual infiltration rates will mirror estimated rates.

A reasonable annual estimated recharge capacity of the effluent recharge basins is 1,000 acre feet. The stormwater recharge basins have an annual recharge capacity of approximately 500 acre feet.

Analysis by Species

Revisions to the Status of the Species:

No revisions are needed to the Status of Species sections of the biological opinion, as amended by the first reinitiation.

Revisions to the Environmental Baseline:

The only revisions needed to the Environmental Baselines of the biological opinion, as amended by the first reinitiation, are as follows:

Huachuca Water Umbel, Southwestern Willow flycatcher, Spikedace, Loach Minnow

Heavy precipitation resulted in the highest flows in recent history in October 2000 on the upper San Pedro River. On 23 October, flows at the Tombstone Gage were 20,000 cubic feet per second (cfs). Flows at Charleston were 12,000 cfs and water levels were eight feet above normal. At Palominas, water levels were 18 feet above normal and flows were at 17,000 cfs (Hess 2000). Median daily October streamflow for the Tombstone, Charleston, and Palominas gages for 1931-1985 were 13.0, 12.2, and 3.7 cfs (ASL 1994). Such floods can be destructive, at least in the short term, because they can cause incisement and loss of vegetation. However, floods can also recharge the floodplain aquifer, create new backwaters and oxbows, and form sandbars that can be colonized by riparian vegetation. The extent to which stream geomorphology and vegetation have been altered by recent flooding is unknown at this time.

In regard to creating seedbeds for riparian trees that may be used by southwestern willow flycatcher, an October flood does not benefit cottonwoods (*Populus fremontii*) and willows (*Salix* sp.), which go to seed early in the spring and exhibit short seed viability. Saltcedar (*Tamarix chinensis*) produces seed into October and germination of this species may be occurring on newly created sandbars. Germination and establishment of other fall or late summer blooming riparian species, such as desert broom (*Baccharis sarothroides*), may have also been enhanced by the flooding.

Effects on water umbel populations are unknown at this time. The ability of water umbel populations to withstand flooding is not well understood. However, the species can withstand floods in the absence of scouring and sedimentation, and can recolonize after floods. After flows of about 800 cfs at Charleston in July 1996, no apparent loss or reduction of 12 Huachuca water umbel populations was noted (Peter Warren, pers. com. 1997). However, during the winter of 1994-5, when flows peaked at 2,250 cfs at Charleston, two patches of water umbel disappeared and were presumed to have been scoured out or buried in sediment (Al Anderson, pers. com. 1995). A scouring flood in August 1998 on Sonoita Creek removed approximately

95 percent of the water umbel population, but one year later the umbel had recolonized the stream and was once again codominant with water cress (*Rorippa nasturtium-aquaticum*) (Warren *et al.* 1991). None of these floods are of the magnitude of the one just experienced on the San Pedro River, thus they may not be very useful in predicting the response of water umbel populations in this instance. We expect that at least some populations were lost in the flood and that suitable colonizing habitats for the species were created in some reaches. The distribution of water umbel on the river may change. Monitoring by Fort Huachuca contractors in 2001 will clarify how water umbel responded.

Spikedace and loach minnow are not known to occur on the upper San Pedro River; thus recent floods are not thought to have directly affected them. Often during floods, fish are washed downstream, stranded in drying backwaters, or otherwise lost. However, in general native fishes populations tend to fair better than nonnative species (Meffe and Minckley 1987, Stefferud and Rinne 1996); thus we expect that populations of nonnative fish species in the San Pedro River may have declined more than native fishes (desert sucker [*Catostomus clarki*] and longfin dace [*Agosia chrysogaster*] are currently the only native fishes known to occur in the Sierra Vista subwatershed of the upper San Pedro River - S. Stefferud, pers. comm. 2000). This would temporarily improve habitats for spikedace and loach minnow.

Revisions to the Effects of the Action:

Huachuca Water Umbel

The primary effects of the Fort's proposed action, as described in the biological opinion and the first reinitiation, focused on possible effects of groundwater pumping and subsequent effects to water umbel and its critical habitat on the upper San Pedro River, as well as effects of on-post activities to populations in the Huachuca Mountains. Construction and operation of the proposed Effluent Reuse Project would occur on the East Range, which lies between populations of water umbel and its designated critical habitat on the San Pedro River and in the Huachuca Mountains. As a result, no direct effects to water umbel or its habitat would occur.

Operation of the project would have indirect effects to the water umbel and its habitat on the San Pedro River as a result of increased groundwater recharge. The project is estimated to recharge annually to the groundwater aquifer up to 500 acre feet of stormwater, that would otherwise be discharged to the Babocomari or San Pedro rivers as run off, and approximately 1,000 acre-feet of sewage effluent. Fort Huachuca had estimated previously that the evaporation ponds at the current wastewater treatment plant probably recharged approximately 450 acre-feet per year (U.S. Fish and Wildlife Service 1999). Thus, the proposed effluent and stormwater recharge facility, which would take the place of the wastewater treatment plant, would result in a net increase in annual groundwater recharge of up to approximately 1,050 acre feet per year.

Corell (1996) modeled groundwater levels and river flow in the upper San Pedro River subwatershed under various scenarios of population growth, consumptive water use, and effluent recharge. Corell examined various scenarios in regard to effluent recharge at the Fort Huachuca wastewater treatment plant. In three of five scenarios examined, 944 acre-feet of

wastewater was recharged at the Fort Huachuca wastewater treatment plant annually. Figures 6, 7, 9, 10, and 12 of Corell clearly show that with operation of the Fort Huachuca recharge facility, a groundwater mound forms around the facility. This mound appears to raise the groundwater level at the wastewater treatment plant by roughly 10 feet. Corell did not include scenarios in which the only variable was operation of a Fort Huachuca effluent recharge facility, so it is not possible to predict from his data what effect the proposed action would have by itself on groundwater elevation and river flow. Groundwater contours suggest that effluent recharged at the treatment plant, as proposed, would flow to either the Babocomari and/or the San Pedro rivers in the vicinity of Fairbank and the confluence of the two rivers; however, a clay lens lies between the project site and the San Pedro River, suggesting recharged effluent may flow to the cone of depression (Don Pool, USGS, Tucson, pers. com. 1999).

Regardless of whether the effluent flows to the Babocomari and/or San Pedro rivers or to the cone of depression (or some combination thereof), increased groundwater recharge clearly mitigates effects of decreasing groundwater levels due to pumping. If effluent flows to the Babocomari and/or San Pedro rivers, the water umbel population and its critical habitat on the San Pedro River near Tombstone Gage, which is downslope of the proposed facility, would likely benefit because of increased hydraulic head at the river and likely increased baseflow. If the effluent flows to the cone of depression, populations and critical habitat hydrologically downslope of cone (including populations at Tombstone Gage, Brunchow Hill, Lewis Springs, and Highway 90) would benefit. All other populations of the water umbel on the San Pedro River are upstream of the groundwater influence of the proposed facility, and would not be affected by it.

In a January 25, 1999 memorandum to the Area Manager, Bureau of Reclamation, Phoenix, the Service concurred with Reclamation's determination that the proposed San Pedro River Wastewater Effluent Recharge Project (at the Sierra Vista Wastewater Treatment Plant) may affect, but is not likely to adversely affect, any listed species, including the Huachuca water umbel. As with the Fort Huachuca facility, although the precise effects are difficult to quantify, effluent recharge hydrologically up slope of the San Pedro river reaches that support water umbel, can only benefit the umbel and its habitat. Our memo also noted that water quality could potentially decline as effluent becomes more important in maintaining river baseflow. However, effluent would move toward the river very slowly (effluent from the Sierra Vista facility would not reach the river for 200 years) and any increase in total dissolved solids or other changes in water quality are likely to be small due to dilution. Observations of Huachuca water umbel grown horticulturally suggest it is tolerant of moderately saline conditions. The likelihood of Fort Huachuca's recharged effluent affecting water quality on the San Pedro or Babocomari rivers is even less than that of Sierra Vista's facility because 1) the Fort's facility is more than five miles further from the San Pedro and Babocomari rivers, 2) the Fort's recharged effluent is much more likely to drain towards the cone of depression, rather than to the rivers, and 3) the Fort's facility is expected to recharge about half of what is expected at Sierra Vista's facility.

Conclusion

After reviewing the current status of the Huachuca water umbel, the environmental baseline for the action area, the effects of the Fort's revised proposed action, and the cumulative effects, it is the Service's biological opinion that the revised proposed action is not likely to jeopardize the continued existence of the Huachuca water umbel and is not likely to result in adverse modification or destruction of critical habitat. We present these conclusions for the reasons listed at page 123 in the biological opinion, in the first reinitiation, and:

- 1) No water umbel populations or critical habitat exist at the East Range Effluent Reuse Project site, thus no direct effects to the species or its critical habitat would occur as a result of construction.
- 2) Operation of the Reuse Project is expected to create a groundwater mound at the project site and result in mitigation of groundwater pumping that threatens water umbel populations and critical habitat on the San Pedro River.
- 3) Changes in river water quality resulting from effluent recharge are expected to be minimal or none, would not occur for a long time, and are not expected to impact water umbel populations.

SOUTHWESTERN WILLOW FLYCATCHER

In the action area, the southwestern willow flycatcher is known to occur only on the San Pedro River. Critical habitat for the species occurs on the San Pedro River from the Hereford Bridge downstream to the Interstate 10 bridge at Benson. As discussed for the water umbel, the only possible effects to the San Pedro River are mitigation of groundwater pumping and possible increased flows on the San Pedro River near Fairbank, and/or on the Babocomari River near the San Pedro confluence, relative to a scenario without the project. Any changes in water quality resulting from effluent recharge are expected to be minimal and would not occur for a long time.

Conclusion

After reviewing the current status of the southwestern willow flycatcher, the environmental baseline for the action area, the effects of the Fort's revised proposed action, and the cumulative effects, it is the Service's biological opinion that the revised proposed action is not likely to jeopardize the continued existence of the southwestern willow flycatcher and is not likely to result in adverse modification or destruction of critical habitat. We present these conclusions for the reasons presented at pages 144-145 of the biological opinion, in the first reinitiation, and:

- 1) The only likely effect on the flycatcher and its habitat are mitigation of groundwater pumping and possible increased flows in the San Pedro River near Fairbank or on the lower reach of the Babocomari River relative to a scenario without the project. Thus, the project is expected to help sustain flycatcher habitat.
- 2) Any changes in water quality are expected to be minimal and would not occur for a long time.

For the reasons listed here and in the biological opinion and the first reinitiation, the Service does not anticipate that the revised proposed action will result in take of the southwestern willow flycatcher. Thus, no incidental take statement, reasonable and prudent measures, or terms and conditions are provided.

MEXICAN SPOTTED OWL

The proposed Effluent Reuse Project would be constructed on the East Range, approximately nine miles northeast of the nearest Mexican spotted owl protected activity centers (PACs) and proposed critical habitat. Groundwater effects and any effects to baseflow on the San Pedro and Babocomari rivers would also occur far removed from Mexican spotted owl habitat and localities. Thus, no effects on the Mexican spotted owl or its proposed critical habitat are anticipated as a result of construction or operation of the proposed East Range Effluent Reuse Project.

Conclusion

After reviewing the current status of the Mexican spotted owl, the environmental baseline for the action area, the effects of the Fort's revised proposed action, and the cumulative effects, it is the Service's biological opinion that the revised proposed action is not likely to jeopardize the continued existence of the Mexican spotted owl and is not likely to result in adverse modification or destruction of proposed critical habitat. We present these conclusions for the reasons presented at page 166 of the biological opinion, in the first reinitiation, and:

The proposed East Range Effluent Reuse Project is located outside of Mexican spotted owl habitat, approximately nine miles northeast of the nearest PACs and proposed critical habitat. No effects to the Mexican spotted owl and its habitat, including proposed critical

habitat, are anticipated.

The Service does not anticipate that revisions to the proposed action will result in increased take of Mexican spotted owl; thus no changes in the incidental take statement, reasonable and prudent measures, or terms and conditions are needed.

LESSER LONG-NOSED BAT

Night flights of lesser long-nosed bats from maternity colonies to flowering columnar cacti have been documented in Arizona at 15 miles, and in Mexico at 25 miles and 38 miles (one way)(Dalton *et al.* 1994; V. Dalton, Tucson, pers. comm., 1997; Y. Petryszyn, University of Arizona, pers. comm., 1997). A substantial portion of the lesser long-nosed bats at the Pinacate Cave in northwestern Sonora (a maternity colony) fly 25-31 miles each night to foraging areas in Organ Pipe Cactus National Monument (US Fish and Wildlife Service 1994). Horner *et al.* (1990) found that lesser long-nosed bats commuted 30-36 miles round trip between an island maternity roost and the mainland in Sonora; the authors suggested these bats regularly flew at least 47 miles each night.

The proposed East Range Effluent Reuse Project is located approximately 9.5 miles east of the nearest known lesser long-nosed bat day roost, which is on Fort Huachuca in the Huachuca Mountains. Several other roosts occur within forty miles of the project site, which, based on the above information, are within foraging distance of the project. Thus, lesser long-nosed bats probably fly through the area. The bats day roost in mines and caves, which do not occur on the East Range. Wren Bridge on the road to the West Gate is a night roost for lesser long-nosed bats, but no night roosts or roosting structures are available in the project area.

While in southeastern Arizona, the lesser long-nosed bat forages on agave flowers, particularly flowers of Palmer's agave (*Agave palmeri*) (Howell 1972). The East Range is characterized primarily by Chihuahuan desert scrub in which agaves are rare or absent. Most stands of Palmer's agave are located closer to the base of the Huachuca Mountains in semi-desert grasslands and Madrean evergreen woodlands. Unlike many species of bats, lesser long-nosed bats are apparently not attracted to bodies of water and are rarely captured over water. Thus, although the project site is well within foraging distance of several roosts, there is probably little reason for the lesser long-nosed bat to visit the area, or even pass through it (the nearest significant stands of agaves to the east of the project site are at the base of the Dragoon Mountains, more than 80 miles from roosts in the Huachuca Mountains.) Because of the lack of agaves in the project area, little or no effects to foraging habitat are anticipated. Relatively few lesser long-nosed bats are expected to visit the project area due to a lack of forage resources in the project area or along the flight path over the project area.

Projects can sometimes create hazards for bats, such as towers with which they may collide, or places in which they attempt to roost and become trapped. However, the Effluent Reuse Project would create no such hazards for bats.

Conclusion

After reviewing the current status of the lesser long-nosed bat, the environmental baseline for the action area, the effects of the Fort's revised proposed action, and the cumulative effects, it is the Service's biological opinion that the revised proposed action is not likely to jeopardize the continued existence of the lesser long-nosed bat. We present this conclusion for the reasons presented at page 189 of the biological opinion and as follows:

Although lesser long-nosed bats may occasionally fly through the East Range Effluent Reuse Project area, the project would have little effect on foraging resources of the bat, no roosts would be affected, and the project is not expected to create any hazards for bats.

The Service does not anticipate that revisions to the proposed action will result in increased take of lesser long-nosed bat; thus no changes in the incidental take statement, reasonable and prudent measures, or terms and conditions are needed.

SONORA TIGER SALAMANDER

The only known likely population of the Sonora tiger salamander on Fort Huachuca is in upper Garden Canyon, approximately 10 miles southwest of the East Range Effluent Reuse Project site. The taxonomic status of this population is unclear (Storfer *et al.* 1999); but for the purposes of the biological opinion, the Service has assumed the upper Garden Canyon population is the Sonora tiger salamander. All other populations of Sonora tiger salamander occur to the west of Fort Huachuca, from the western slope of the Huachuca Mountains across the San Rafael Valley to the foothills of the Patagonia Mountains. Storfer *et al.* (1999) noted tiger salamanders at ponds four and five of the Fort Huachuca wastewater treatment plant. However, these salamanders have been identified as *Ambystoma tigrinum mavortium*.

The proposed Effluent Reuse Project lies outside of the range of the Sonora tiger salamander and is not expected to affect in any way populations or habitats of the salamander.

Conclusion

After reviewing the current status of the Sonora tiger salamander, the environmental baseline for the action area, the effects of the Fort's revised proposed action, and the cumulative effects, it is the Service's biological opinion that the revised proposed action is not likely to jeopardize the continued existence of the Sonora tiger salamander. We present this conclusion for the reasons presented at page 201 of the biological opinion and as follows:

The proposed East Range Effluent Reuse Project lies approximately 10 miles east of the range of the Sonora tiger salamander. No effects to the salamander or its habitat are anticipated from the project.

The Service does not anticipate that revisions to the proposed action will result in increased take of Sonora tiger salamander; thus no changes in the incidental take statement, reasonable and prudent measures, or terms and conditions are needed.

Other Findings/Sections in the Biological Opinion and First Reinitiation

All other sections and findings in the Service's October 27, 1999, biological opinion, and the September 29, 2000, first reinitiation remain the same. This document is designated the second reinitiation or amendment of the biological opinion.

REINITIATION NOTICE

This concludes reinitiation of formal consultation on the Fort Huachuca Programmatic Biological Opinion in regard to addition of the East Range Effluent Reuse Project to the proposed action, designation of critical habitat for the spikedace and loach minnow, and proposal of critical habitat for the Mexican spotted owl. 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 maintained (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 adversely 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 a listed species or critical habitat that was not considered in this opinion; or 4) a new species is listed or critical habitat designated that may be affected by this action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation, if it is determined that the impact of such taking will cause an irreversible and adverse impact to the species.

Any questions or comments should be directed to Doug Duncan (520) 670-4860, Jim Rorabaugh (x238), or Sherry Barrett (520) 670-4617.

Sincerely,

/s/ David L. Harlow
Field Supervisor

cc: Regional Director, Fish and Wildlife Service, Albuquerque, NM (ARD-ES)
Assistant Field Supervisor, Fish and Wildlife Service, Tucson, AZ
Michael Schoessler, Office of the Regional Solicitor, Albuquerque, NM

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

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APPENDIX 1: CONCURRENCES

The biological opinion included our concurrences that the proposed action may affect, but is not likely to adversely affect, the Canelo Hills ladies' tresses, spikedace, and loach minnow. Since the opinion was issued, critical habitat was proposed and designated for spikedace and loach minnow on the San Pedro River from the Babocomari River confluence south to the international boundary.

Canelo Hills ladies' tresses

The nearest locality for Canelo Hills ladies' tresses is at the Babocomari Cienega, several miles upstream of Huachuca City. The source of the cienega's permanent water is probably a volcanic dike that causes a pooling of groundwater along the Babocomari River, as well as groundwater flow through fractures and solution channels that run between the Mustang Mountains and the Babocomari River (Houser 1998, Arizona Department of Water Resources 1991). This population of ladies' tresses is also hydrologically up slope of the proposed Effluent Reuse Project in the Babocomari drainage. As a result, construction and operation of the project is not expected to affect the Canelo Hills ladies' tresses.

Conclusion

After reviewing the current status of the Canelo Hills ladies' tresses, the environmental baseline for the action area, and the effects of the Fort's revised proposed action, the Service concurs with the Fort's determination that the revised proposed action may affect, but is not likely to adversely affect, the Canelo Hills ladies' tresses. We present this conclusion for the reasons presented at page 217-218 of the biological opinion, in the first reinitiation, and as follows:

No populations of Canelo Hills ladies' tresses occur in the project area and the nearest population, at Babocomari Cienega, is hydrologically up slope of the area affected by the project.

Spikedace and Loach Minnow

The primary concerns for spikedace and loach minnow described in the biological opinion were possible continued groundwater pumping in excess of recharge, depletion of the regional aquifer, and subsequent effects to the baseflow and riparian vegetation of the San Pedro River. The final critical habitat rule identifies "permanent, flowing, unpolluted water" as one of the constituent elements of spikedace and loach minnow critical habitat. The rule goes on to say that any Federal activity that would significantly and detrimentally alter the minimum flow or the natural flow regime of any stream segment identified as critical habitat could result in destruction or adverse modification of critical habitat.

Because of commitments made by the Fort to develop and implement a water resources plan, both on-post and, with the help of other water users in the subwatershed, off-post, the Service found that the proposed action would not result in declining baseflows or degradation of riparian and aquatic habitats on the San Pedro River (US Fish and Wildlife Service 1999). Our concurrences for the spikedace and loach minnow were predicated on implementation of water resource planning that would mitigate any possible effects to the river and preserve recovery opportunities for these fishes. As described for the water umbel and flycatcher, herein, the proposed East Range Effluent Reuse Project can only benefit habitats on the San Pedro River by mitigating groundwater pumping in excess of recharge. Also, as described for the umbel and flycatcher, effluent recharged to the aquifer will eventually flow to the San Pedro River. Although it will take a long time for the effluent to actually reach the river, recharged effluent

may increase the salinity of the river or increase the concentrations of some pollutants. However, spikédace and loach minnow are relatively insensitive to water quality problems and any effluent that reaches the river will be significantly diluted.

The effluent and stormwater recharge ponds are not expected to provide habitat for nonnative fishes or other organisms that could colonize or augment populations of nonnatives in the San Pedro River, and possibly reduce recovery opportunities there. Of the 7 effluent recharge ponds and the 2 stormwater recharge ponds, only E1 will hold water permanently. The others will be repeatedly filled and dried out, which are not conducive to supporting fish populations. The East Range is not frequented by the public and the odors from the effluent ponds should deter anglers, making it highly unlikely that pond E1 would be illegally stocked with nonnative fish.

Conclusion

After reviewing the current status of the spikédace and loach minnow, the environmental baseline for the action area, and the effects of the Fort's revised proposed action, the Service concurs with the Fort's determination that the revised proposed action may affect, but is not likely to adversely affect, spikédace, loach minnow, or critical habitat designated for these species. We present this conclusion for the reasons presented at pages 212 and 214 of the biological opinion, in the first reinitiation, and as follows:

1. The proposed East Range Effluent Reuse Project is expected create a groundwater mound at the project site, and result in mitigation of groundwater pumping that threatens spikédace and loach minnow critical habitat on the San Pedro River.
2. Any decline in water quality on the San Pedro River is likely to be small due to dilution, and is not expected to affect spikédace or loach minnow.
3. The effluent and stormwater recharge ponds would, for the most part, be poor habitat for nonnative fishes, and anglers are unlikely to frequent the area.

References Cited

- Arizona Department of Water Resources. 1991. Preliminary hydrographic survey report for the San Pedro River watershed. Volume 1: General Assessment. Phoenix, Arizona. 548 pp.
- Houser, B. 1998. 26 May 1998 letter from Brenda Houser, U.S. Geological Survey, Tucson, AZ, to Jim Rorabaugh, U.S. Fish and Wildlife Service, Phoenix, AZ.
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