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FISH AND WILDLIFE SERVICE Mountain-Prairie Region

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Utah Ecological Services Field Office
2369 West Orton Circle, Suite 50
West Valley City, Utah 84119

OCT 07 2019

Memorandum

To: Project Leader, Lower Green River National Wildlife Refuge Complex,
U.S. Fish and Wildlife Service, HC69 Box 232, Randlett, UT 84063

From: Utah Field Supervisor, Ecological Services, U.S. Fish and Wildlife Service,
West Valley City, Utah

Re: Reinitiation of Final Biological Opinion for the Thurston Energy 2-Well Project at Ouray
NWR for Colorado Pikeminnow, Bonytail, Humpback Chub, and Razorback Sucker and
Informal Consultation for Western Yellow-Billed Cuckoo and Uinta Basin Hookless Cactus

We received your letter, dated September 19, 2019, requesting reinitiation of consultation for the Thurston Energy (Applicant) 2-Well Project (Project) at Ouray National Wildlife Refuge (NWR) in Utah. In accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) and the Interagency Cooperation Regulations (50 CFR 402), this transmits our amended biological opinion (BO) for the Project. The Project will occur at the same general locations as evaluated in our original BO dated October 31, 2014, but will increase in well pad footprint to accommodate tank batteries and produced fluid treatment equipment. Additional details on the Project's modifications are described below.

You determined the Project may affect, but is not likely to adversely affect the western yellow-billed cuckoo (*Coccyzus americanus*; threatened) and may affect, but is not likely to adversely modify proposed critical habitat for the species. We concur with your determinations for western yellow-billed cuckoo because:

1. Thurston would not conduct construction, drilling, or completion activities during the yellow-billed cuckoo nesting season (previously agreed to as June 15th to August 31st). Therefore, project-related noise, light, and human related impacts to nesting cuckoos during these Project phases are not anticipated for the majority of the specie's nesting season.

2. Tanker trucks would be limited to dustless speed or 10 mph and would only be allowed to access facilities from 1:00 to 4:00 p.m. daily. This conservation measure will minimize light and noise related disturbance to western yellow-billed cuckoo that would otherwise result from higher-speed or nighttime tanker truck traffic.
3. Hospital grade mufflers would be attached to pumpjacks to ensure noise does not exceed 60 decibels (dB) at 50 feet. Because the majority of western yellow-billed cuckoo nesting habitat is beyond 50 feet from pumpjack locations, noise related effects will be minimal.
4. No impacts to western yellow-billed cuckoo habitat are anticipated.

You determined the Project may affect, but is not likely to adversely affect the Uinta Basin hookless cactus (*Sclerocactus wetlandicus*; threatened), and we concur with your determination because:

1. Tanker trucks would be limited to dustless speed or 10 miles per hour (mph), reducing negative effects of dust to successful pollination of flowers.
2. No Uinta Basin hookless cactus were found in previous Project surveys within the habitat areas where the well pads, roads, and pipeline will be located, or within the 300 foot buffer of these areas.
3. A new Uinta Basin hookless cactus survey will be conducted throughout the Project area by a U.S. Fish and Wildlife Service (Service) certified botanist prior to ground disturbing activities, and plants will be avoided by 300 feet.

Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, the above determinations may be reconsidered. No further analysis of impacts to the western yellow-billed cuckoo or Uinta Basin hookless cactus is included in this BO.

As determined in our original evaluation, the Project still affects the Colorado pikeminnow (*Ptychocheilus lucius*; endangered), razorback sucker (*Xyrauchen texanus*; endangered), humpback chub (*Gila cypha*; endangered), bonytail (*Gila elegans*; endangered), (collectively Colorado River fishes), and their designated critical habitat. This BO amendment is based on information provided in your September 19, 2019, request for reinitiation, the Project's supplemental environmental assessment, and telephone communications and email correspondence between our offices from September 2018 through September 2019.

We received your original letter dated October 20, 2014, requesting consultation for the Thurston Energy 2-Well Project. Project implementation included drilling, completing, producing, and reclaiming two oil and gas wells located within Ouray NWR (or Refuge). The proposed wells would target the Green River and Wasatch formations and require construction and maintenance of associated access roads and natural gas pipelines.

UPPER COLORADO ENDANGERED FISH RECOVERY PROGRAM

Water depletions from the Upper Colorado River Basin are likely to adversely affect the Colorado River fishes and their designated critical habitat through multiple ecological stressors, such as habitat loss, competition from nonnative fish, and degraded water quality. Because water depletions from the Upper Colorado River Basin are a major factor in the decline of the endangered fishes, historically we determined that any depletion will jeopardize their continued existence and will likely contribute to the destruction or adverse modification of their critical habitat (USFWS 1997).

To address the ecological effects from water depletions and aid in the recovery of the four species, the Department of the Interior, the States of Wyoming, Colorado, and Utah, and the Western Area Power Administration established the Upper Colorado River Endangered Fish Recovery Program (Recovery Program) in 1988. The objective of the Recovery Program is to recover the listed species while water development continues in accordance with Federal and State laws and interstate compacts.

In order to further define and clarify the process for addressing water depletion impacts, the Recovery Program participants implemented an agreement under section 7 (Agreement) on October 15, 1993. This Agreement established the Recovery Program and its activities as the reasonable and prudent alternative (RPA) for impacts to Colorado River fishes caused by depletions from the Upper Colorado River Basin. Incorporated into this Agreement is a plan of actions (Recovery Implementation Program Recovery Action Plan or RIPRAP) that identifies activities required to recover the endangered fishes to be carried out by Recovery Program participants. Also incorporated into the Agreement is the requirement of a financial contribution to the Recovery Program (also known as a depletion fee) that would help fund recovery activities. We use procedures outlined in the Agreement to determine if sufficient progress is being accomplished in the recovery of the endangered fishes to enable the Recovery Program to continue to serve as a reasonable and prudent alternative to avoid jeopardy. We finalized the RIPRAP on October 15, 1993, and have reviewed and updated the plan annually.

In accordance with the 1993 Agreement, we annually assess progress of the implementation of recovery actions to determine if progress toward recovery is sufficient for the Recovery Program to serve as a RPA for projects that deplete water from the Colorado River. In the last review, we determined that the Program made sufficient progress to offset water depletions from individual projects up to 4,500 acre-feet/year. Therefore, it is appropriate for Recovery Program actions to serve as Conservation Measures for projects up to 4,500 acre-feet/year.

After many years of successful implementation of the Recovery Program, the Agreement, and the RIPRAP, federal action agencies now anticipate Recovery Program activities and payment of the depletion fee to serve as the RPA. Thus, the RPA has essentially become part of a proposed action.

Because we now consider it part of a proposed action, the depletion fee and Recovery Program activities now serve as conservation measures that minimize adverse effects to listed species or critical habitat. Therefore, we no longer consider depletions to jeopardize the continued existence of these species, but rather believe that depletions may affect and are likely to adversely affect the species, and that the Recovery Program activities will now serve as conservation measures within the proposed action and minimize adverse effects to listed species or critical habitat.

As mentioned above, included in the Recovery Program was the requirement that a depletion fee would be paid to help support the Recovery Program. On July 8, 1997, we issued an intra-Service BO determining that depletion fees for average annual depletions of 100 acre-feet or less are no longer required due to sufficient progress on the recovery of Colorado River fishes. The estimated water depletion for this Project is 5.7 acre-feet per year. Therefore, the depletion fee for this Project is not required. For information on water depletions associated with the Project, see the Effects section in this BO.

BIOLOGICAL OPINION

1.0 PROPOSED ACTION

The Applicant seeks to modify a previously authorized two oil well development project on the Ouray NWR which was originally described in our October 31, 2014, BO. The Project includes construction of two well pads and associated tank batteries, construction of 420 feet of new access road, and installation of 7,216 feet of 3-inch surface, high-density polyethylene (HDPE) natural gas pipeline. All well pads, roads and pipelines will be outside the 100-year floodplain. Produced product would be removed from the well area by approximately 1 to 4 tanker trucks traveling on Refuge roadway (and adjacent to the Green River) daily during the 30 to 40 year production phase. The Applicant also intends to deplete 5.7 acre-feet of water from the Green River for construction purposes. The Project would use water purchased from willing sellers in the Ouray Park Irrigation District and delivered via the Refuge water delivery system to minimize impacts associated with a depletion from the Green River.

Conservation Measures

The Applicant and the Refuge have committed to the following conservation measures to reduce impacts to Colorado River fishes:

- A 430-foot Jersey barrier would be installed along the Refuge road to minimize spill potential into the Green River.
- Sediment control measures will be implemented during Project construction to reduce the amount of sedimentation entering the adjacent 100-year floodplain and the Green River.

- As stated above, water for development and completion activities would be purchased from willing sellers in the Ouray Park Irrigation District and delivered via the Refuge water delivery system to minimize impacts associated with a depletion from the Green River.

Additional information on the proposed action and Conservation Measures are described in the environmental assessment, supplemental environmental assessment, and BA for the Project and are incorporated by reference here.

Specific Changes to the Project

Thurston originally planned to construct two well pads just outside of the Green River's 100-year floodplain, and place centralized collection, treatment, storage, and export facilities (tank battery and associated equipment) on State lands north of the upper Ouray NWR road. These facilities would have been located on a bluff away from Ouray NWR headquarters, thus removing the need to have tanker trucks on the main Refuge road and tank batteries located near Leota Bottom and the Green River. However, subsequent analysis determined that there would be a lack of sufficient margin of safety for the necessary pipelines and pumping pressures for this configuration. Based on this limitation, Thurston's proposed changes to the project include the following:

- Construction of two well pads, each 2.55 acres in size within an average disturbed area of 3.2 acres. This is a change from two well pads, each 1.66 acres in size within an average disturbed area of 2.2 acres, plus a produced fluid treatment and tank battery pad of 1.38 acres within a disturbed area of 1.81 acres on top of the bluff within the Ouray NWR under the previously approved action (PAA). The increased size of well pads is now needed to accommodate adjacent tank batteries, produced fluid treatment equipment, and turn around areas for tanker trucks.
- Construction of approximately 420 feet of new access road, versus 597.6 feet under the PAA.
- Installation of 7,216 feet of 3-inch surface, high-density polyethylene (HDPE) natural gas pipeline laid by hand from the nearest gas gathering trunk line on top of the bluff within the Ouray NWR to the well pads. This is a change from 7,131 feet of bundled, 8-inch, surface, HDPE, heat-traced, 3-phase (mixed oil, gas, and water) production pipeline under the PAA. This change is mandated by lack of sufficient margin of safety for the long-term use of the bundled, 8-inch, heat traced, HDPE pipe product operated at its maximum allowable manufacturer-rated pressure for crude oil service, due to the elevation difference between the well locations and the produced fluid treatment and tank battery pad on top of the bluff.
- Elimination of approximately 9,768 feet of overhead electric power lines under the PAA. This was to be used to for powering equipment at the well site which will now be supported by natural gas powered equipment.

- Tank batteries and produced fluid treatment equipment would be placed on the well pads in accordance with best management practices for the Three Rivers field.
- Approximately 1 to 4 tanker trucks would travel on the Refuge roadway daily during the 30 to 40 year production phase. This frequency would diminish with time because well productivity decreases over the life of the wells. This is a change from having no tanker traffic on the Refuge roadway following construction and development under the PAA.

2.0 ACTION AREA

Our regulations define the action area as “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action” (50 CFR section 402.02). Therefore, we determined the action area includes the:

- The Project’s permanent and temporary construction footprint; and
- The Green River from approximately 0.5 miles from the upstream end of the Project’s well pad location continuing downstream to Lake Powell. This includes designated critical habitat for the four Colorado River fishes (59 FR 13374), which we defined as the 100-year floodplain of the Green Rivers. The Project’s associated water depletions would result in a loss of water from the Upper Colorado River Basin. Water depletions in the Colorado River reduce habitat quantity and quality for aquatic species throughout the Upper Colorado River Basin and can affect listed species as they move upstream and downstream of the Project area.

3.0 STATUS OF THE SPECIES

3.1 COLORADO PIKEMINNOW

The Colorado pikeminnow is a large minnow native to the Colorado River system of the western United States and northern Mexico. The current range of the Colorado pikeminnow is reduced due to flow regulation, habitat loss, migration barriers (i.e., dams), and the introduction of nonnative fishes. The species now exists only in the Upper Colorado River system. We discuss specific information on Colorado pikeminnow populations in the Environmental Baseline section below.

Adult Colorado pikeminnow prefer medium to large rivers, where they occur in habitats ranging from deep, turbid rapids to flooded lowlands. Slow-moving backwaters serve as nursery areas for young pikeminnow (USFWS 2002a). The Colorado pikeminnow primarily eats fish and minnows, but smaller individuals will also feed on insects and other invertebrates.

We designated six reaches of the Colorado River System as critical habitat, including portions of the Colorado, Green, Yampa, White, and San Juan rivers, totaling 1,148 miles of critical habitat for the species (59 FR 13374).

In Utah, we designated 726 miles of critical habitat in portions of the Green, Colorado, White, and San Juan rivers and their associated 100-year floodplains. We developed a recovery plan for the Colorado pikeminnow in 1991 and subsequently revised the plan in 2002 (USFWS 2002a).

3.2 RAZORBACK SUCKER

The largest native sucker to the western United States, the razorback sucker is a river catostomid endemic to the Colorado River Basin (USFWS 2002b). The species feeds primarily on algae, aquatic insects, and other aquatic macroinvertebrates. We listed razorback sucker as an endangered species in 1991. The current range of the species is reduced due to flow regulation, habitat loss, migration barriers, and the introduction of nonnative fishes. We discuss specific information on razorback sucker populations in the Environmental Baseline section below.

Historically, the razorback sucker occupied the mainstem Colorado River and many of its tributaries from northern Mexico through Arizona and Utah into Wyoming, Colorado, and New Mexico. Populations of this species in the Upper Colorado River Basin occur in the Green, Upper Colorado, and San Juan rivers (USFWS 2002b). Habitat occupied by the sucker appears to be seasonal, and they prefer warm water rivers.

Designated critical habitat occurs in portions of the Green, Colorado, Duchesne, White, and San Juan Rivers (59 FR 13374). In Utah, we designated 688 river miles and the associated 100-year floodplain as critical habitat. We finalized the recovery plan for the species in 2002 (USFWS 2002b).

3.3 HUMPBACK CHUB

The humpback chub is a medium-sized freshwater fish of the minnow family endemic to the Colorado River Basin. Humpback chub mainly occur in river canyons where they use a variety of habitats, including deep pools, eddies, upwells near boulders, and areas near steep cliff faces. Young and spawning adults are generally found in sandy runs and backwaters (USFWS 2002c). We discuss specific information on humpback chub populations in the Environmental Baseline section below.

Humpback chub occur in portions of the main-stem Colorado River and two tributaries, the Green and Little Colorado Rivers. Its habitat preferences are not well understood, but are associated with a variety of habitats, including pools ranging from 1 meter to 15 meters in depth with turbulent to no current. Substrates of occupied habitat include silt, sand, boulder, and bedrock (USFWS 2011).

Currently, there are five known self-sustaining populations of humpback chub. Four occur in the Upper Colorado Basin Recovery Unit and one occurs in the Lower Colorado Basin Recovery Unit. In Utah, Desolation and Gray canyons of the Green River hold one of three abundant populations of this species (USFWS 2002c) in the Upper Basin.

We designated 139 river miles and adjacent 100-year floodplain in Utah as critical habitat for the humpback chub in portions of the Green and Colorado Rivers (59 FR 13374). We finalized the latest recovery plan for the species in 2002 (USFWS 2002c).

3.4 BONYTAIL CHUB

Bonytail chub is a minnow species native to the Colorado River Basin. Bonytail distribution and population has declined significantly over the last century. This species was one of the first fish species to reflect the changes that occurred to the Colorado River system from construction of Hoover Dam, which caused an alteration to the natural flow regime of the river. Other causes for the near extinction of this fish include habitat loss/alteration and competition with nonnative fishes in the Colorado River (USFWS 2002d). We discuss specific information on bonytail chub populations in the Environmental Baseline section below.

We know little about the specific food and habitat of the bonytail because the species was extirpated from most of its historic range prior to extensive surveys, but we believe it is adapted to mainstem rivers. The species resides in pools and eddies and its primary food sources are terrestrial and aquatic insects (USFWS 2002d). In Utah, the bonytail occurs in the Green River and Colorado River. We designated 139 river miles and the adjacent 100-year floodplain in Utah as critical habitat for the bonytail chub in these rivers (59 FR 13374). We finalized the latest recovery plan for the species in 2002 (USFWS 2002d).

4.0 ENVIRONMENTAL BASELINE

Regulations implementing the ESA (50 CFR section 402.02) define the environmental baseline (within the definition of “Effects of the action”) as “the past and present impacts of all Federal, State, or private actions and other human activities in an, action area, the anticipated impacts of all proposed Federal projects in an action area that have already undergone section 7 consultation and the impacts of State or private actions that are contemporaneous with the consultation in process.”

4.1 STATUS OF THE SPECIES IN THE ACTION AREA

The Project includes the mainstem Green River in Utah. For all four endangered fish species, the Project occurs within the Upper Colorado River Basin Recovery Unit. Within this Recovery Unit, we established specific recovery criteria for the Green River sub-basin for all four species, including population demographics. Self-sustaining and stable populations of these species in the Green River sub-basin are required for species recovery (USFWS 2002a, 2002b, 2002c, 2002d).

We designated the entire length the Green River and its 100-year floodplains between the Yampa River confluence and the Colorado River confluence as critical habitat for at least one of the species (59 FR 13374). The Project is located adjacent to critical habitat for both the Colorado pikeminnow and razorback sucker, and between the confluence of the Green and Yampa Rivers (directly upstream) and Desolation Canyon (directly downstream).

Currently, the Project area includes:

- a wild population of Colorado pikeminnow;
- one of two primary Colorado pikeminnow nursery habitats;
- known, active migratory routes for spawning Colorado pikeminnow and razorback sucker;
- habitat upstream of the Desolation Canyon humpback chub population center; and
- known occupied habitat for Colorado pikeminnow, razorback sucker, humpback chub, and bonytail.

4.1.1 Colorado Pikeminnow

The largest, most productive and most robust population of Colorado pikeminnow in the upper Colorado River Basin occurs in the mainstem Green River (combining the lower Green River, Desolation and Gray Canyon, White River, Yampa River, and middle Green River populations). Higher abundance of Colorado pikeminnow juveniles and recruits in the 2006 to 2008 sampling period is attributed to a relatively strong year class of age-0 Colorado pikeminnow produced in the lower Green River in 2000 (Bestgen et al. 2010). Length frequency histograms, especially in the Desolation-Gray Canyon and lower Green River reaches, indicate that abundance of Colorado pikeminnow recruits was much higher in the period from 2006 to 2008, than from 2000 to 2003 (Bestgen et al. 2010).

The importance of the lower Green River Colorado pikeminnow population is evidenced by increased abundance of adult Colorado pikeminnow in the White River and middle Green River through 2008. This phenomenon is almost certainly the result of upstream movement (high transition rates) of large numbers of juvenile and recruit-sized Colorado pikeminnow that originated in downstream reaches of the Green River in 2006 and 2007 (Bestgen et al. 2010).

In recent years, Colorado pikeminnow populations have declined and the most recent population estimate in the Green River sub-basin numbers around 2,000 adult pikeminnow (Bestgen et al. 2018).

4.1.2 Razorback Sucker

Since 2000, over 560,000 subadult razorback suckers have been stocked in the Green and upper Colorado River subbasins. From 2004 to 2007 approximately 96,400 fish were stocked and 1,511 recapture events from 1,470 unique individuals were encountered from 2005 to 2008. In 2012, tag-reading antennae were placed on a spawning bar in the middle Green River near Dinosaur National Monument in northeast Utah. Fifty-two unique razorback sucker stocked between 2004 and 2010 were detected, 88 percent of which were not seen since stocking. During sampling for Colorado pikeminnow estimates, 938 and 765 razorback sucker were captured in 2011 and 2012, respectively, in the Ouray to Green River, Utah reach of the main channel of the Green River. In a monitoring plan (Bestgen et al. 2012), estimates of large juvenile to adult razorback sucker in three reaches of the Green River ranged from 474 to over 5,000 within a reach. Although these estimates are highly imprecise, they provide further confirmation that stocked fish are surviving in the wild. Razorback sucker abundance increased in all reaches of the Green River in recent years, largely from increased survival of stocked fish (Zelasko et al. 2018). Because of the successes in razorback sucker recovery, we published a 5-year review in 2018 proposing to reclassify razorback sucker from endangered to threatened status (USFWS 2018a).

Colorado pikeminnow spawn in two principal sites including Gray Canyon in the lower Green River and the lower Yampa River (USFWS 2002a). Known spawning sites for razorback sucker are located in the lower Yampa River and in the Green River near Escalante Ranch, but other, less-used sites are probable, such as Desolation Canyon (USFWS 2002b). Both of these species are migratory spawners whose young emerge as larval fish from spawning locations and drift downstream. Because pikeminnow and razorback sucker spawning locations occur upstream of the Project and known populations occur downstream of the Project, adults and larval fish must pass the Project during reproductive cycles.

4.1.3 Humpback Chub

Four wild populations of humpback chub inhabit canyon-bound sections of the Colorado and Green Rivers including Desolation and Gray Canyons, Cataract Canyon, Black Rocks, and Westwater Canyon. Although humpback chub are primarily resident fish, some movement between populations is expected. The Project is upstream of the Desolation and Gray Canyons humpback chub population in the Project action area.

We estimated the Desolation/Gray Canyons population of wild adults at 1,300 in 2001, 2,200 in 2002, and 940 in 2003 (Jackson and Hudson 2005).

Sampling in 2001 and 2002 was conducted in summer, whereas beginning in 2003, sampling was shifted to fall to avoid capturing Colorado pikeminnow that use Desolation Canyon for spawning. A report on 2006 to 2007 population estimates for humpback chub indicated that this population was trending downward (Badame 2012). The report linked declining catch of humpback chub in the upper portions of Desolation Canyon in the 2006 to 2007 estimates with increasing densities of nonnative smallmouth bass (*Micropterus dolomieu*). However, the most recent population estimate showed recent increases and stability with estimates of 1,863 humpback chub in 2014 and 1,672 in 2015 (Howard and Caldwell 2018). Because of the successes in humpback chub recovery we published a 5-year review in 2018 proposing to reclassify humpback chub from endangered to threatened status (USFWS 2018b).

4.1.4 Bonytail Chub

Bonytail are so rare that it is currently not possible to conduct population estimates. In response to the low abundance of individuals, the Recovery Program implemented a stocking program to reestablish populations in the Upper Basin (Upper Colorado River Endangered Fish Recovery Program and San Juan River Basin Recovery Implementation Program 2010). Since 1996, over 600,000 tagged bonytail subadults were stocked in the Green and Upper Colorado River subbasins.

To date, stocked bonytail do not appear to be surviving as well as stocked razorback sucker. Researchers continue to experiment with pre-release conditioning and exploring alternative release sites to improve their survival. Since 2009, an increasing number of bonytail were detected at several locations throughout the Upper Colorado River Basin where stationary tag-reading antennas are used. During high spring flows in 2011, more than 1,100 bonytail (16.6 percent of the 6,804 stocked in early April of that year) were detected by antenna arrays in the breach of the Stirrup floodplain on the Green River. In 2015 and 2016, researchers documented natural bonytail reproduction for the first time since listing (Bestgen et al. 2017). Recent recaptures of bonytail in the Green River a year after stocking provide promising results that individuals are surviving.

To augment natural populations, the Recovery Program produces genetically diverse fish in hatcheries and stocks them in the river system. The stocking program is guided by an integrated stocking plan and utilizes at least seven fish hatcheries for propagation. In most years, the Recovery Program was successful at meeting stocking goals. In addition, the Recovery Program is working on research projects to improve the survivorship of stocked fish. Razorback sucker and bonytail are stocked into the Green River, both upstream and downstream of the Project.

4.2 STATUS OF CRITICAL HABITAT IN THE ACTION AREA

The action areas include critical habitat units identified as essential for the species' recovery (USFWS 2002a, 2002b, 2002c, 2002d).

This section of the Green River is within designated critical habitat for the Colorado pikeminnow and razorback sucker and downstream portions of the action area include designated critical habitat for bonytail and humpback chub.

We identified water, physical habitat, and the biological environment as the physical or biological features of critical habitat for listed Colorado River fish species (59 FR 13374-13400).

All four federally listed species evolved in desert river hydrology, relying on high spring flows and stable base flows for habitat conditions essential to their survival. In addition to main channel migration corridors, Colorado pikeminnow, bonytail, and razorback sucker rely on floodplain and backwater habitats for various stages of their life history. High spring flows also act as spawning queues (USFWS 2002a, 2002b, 2002d). In contrast, humpback chub rely more on canyon-bound reaches with swift currents and white water (USFWS 2002c). The physical and biological features for critical habitat are present within the action area, although sometimes affected by human activities.

5.0 EFFECTS OF THE ACTION

One of the primary ways water depletions can affect Colorado River fishes is through entrainment of fish into water conveyance systems. Larval endangered fish are the most susceptible to entrainment into intake structures because of their lack of swimming ability and small size. The proposed action intends to use 5.7 acre-feet of water from the Ouray Park Irrigation District which would be delivered via the Refuge water delivery system. This system uses water that comes from tributaries to the Green River which do not contain any Colorado River fishes. Because Colorado River fishes would not have any ability to come in contact with this water supply, we do not expect entrainment of Colorado River fishes to occur as a result of the Project.

Reductions in water availability can increase the likelihood of water quality issues, increasing Colorado River fishes' vulnerability to predation, and reducing breeding opportunities by shrinking the amount of breeding habitat within their range. Depletions may affect water quality in the action area by increasing concentrations of heavy metals, selenium, salts, pesticides, and other contaminants. Increases in water depletions cause associated reductions in dilution potential for any contaminants that enter the river (EPA 2014). Increased contaminant concentrations in the river may result in an increase in the bioaccumulation of these contaminants in the food chain, with negative effects to the Colorado River fishes, particularly the predatory Colorado pikeminnow (Osmundson and Lusk 2019). Selenium is of particular concern due to its effects on fish reproduction and its tendency to concentrate in low velocity areas that are important habitats for Colorado pikeminnow and razorback sucker (Hamilton et al. 2005).

Reduced flows from water depletions can also result in habitat alteration in river systems that affect Colorado River fishes. Depletions can reduce high spring flows, resulting in reductions to food supply and productivity. Reductions in flows also reduce spawning habitat availability and adversely affect low-velocity backwater habitats important for juvenile Colorado River fishes, as the quantity and timing of flows influence how the channel and various habitats are formed and maintained (Muth et al. 2000). Reductions in spring peak flows and summer base flows caused by water depletions allow vegetation to encroach the river channel, which harden the riverbanks and cause channel narrowing. Channel narrowing negatively affects Colorado River fishes habitats because as the channel width decreases, water velocity increases, and the amount of low velocity habitats important to the early life stages of the fish decreases (Muth et al. 2000).

Reduced flows and habitat alteration from water depletions also contribute to an increase in nonnative fish populations. Reduction in flows contributes to further habitat alterations that support nonnative fish species, such as increased temperatures, reduced habitat availability, and reduced turbidity (Recovery Program 2014). Colorado River fishes within the action area may experience increased competition and predation as a result.

The Project will affect Colorado River fishes by reducing the amount of water in the river system upon which they depend by up to 5.7 acre-feet per year. As discussed in the Upper Colorado Endangered Fish Recovery Program section above, we previously determined that water depletions adversely affect the four Colorado River fishes. The Recovery Program serves as the RPA for water depletions up to 4,500 acre-feet per year, and depletions of 100 acre-feet or less per year are now exempt from the depletion fee. The estimated water depletion for this Project is 5.7 acre-feet per year. Therefore, the depletion fee for this Project is waived.

Accidental spills from the Project well pads, pipelines, and tanker trucks are possible. If a spill occurred, the specifics regarding location, timing, and volume of spills associated with the Project are unknown at this time. We note that the Refuge and the Applicant have committed to conservation measures to reduce the potential for a spill or volume of products spilled. These include the use of spill and leak detection equipment, development of a spill prevention, containment, countermeasures, and reporting plan, and use of low speed on Refuge roads. These conservation measures substantially reduce the likelihood of a spill occurring, and the size of a spill if one were to occur. Therefore, in our professional judgment we think that acute and chronic effects of refined petroleum spills or other toxicants from the Project are low. While an accidental spill of product into the waterway could cause the loss of individual fish depending on the river flow volumes and spill size, best management practices would reduce the likelihood of petroleum products reaching the waterway. This is because proper procedures will be in place to prevent and respond to any spills (USFWS 2019). Spills of other construction materials (e.g., concrete, sand) are also possible although we predict the risks of these spills are low. If construction introduced these materials into the river while Colorado River fishes are present, the species response would be proportionate to the amount and toxicity of the released materials.

Because activities will be carried out while Colorado River fishes are isolated from the area, the anticipated risks to the species would be minimal.

The Applicant has committed to sediment control measures including the use of sediment control mats, and other minimization measures during construction and post-construction to reduce the amount of sediment entering wetlands and rivers near the Project area (USFWS 2019). Through these avoidance and minimization measures, we expect sedimentation from Project activities would not measurably increase above natural sedimentation levels in riverine areas adjacent to the Project area. Therefore, we expect only minor effects to Colorado River fishes associated with increased sedimentation from construction.

5.1 CUMULATIVE EFFECTS

Cumulative effects “...are those effects of future state, or private activities, not involving Federal activities that are reasonably certain to occur in the action area of the Federal action subject to consultation” (50 CFR section 402.02). We do not consider future federal actions that are unrelated to the proposed action in this section because they require separate consultation pursuant to section 7 of the ESA.

Declines in the abundance or range of Colorado River fishes and their critical habitats are attributed to various human activities on federal, state, and private lands, such as the following:

- human population expansion and associated infrastructure development;
- water retention, diversion, or dewatering of springs, wetlands, or streams;
- recreation, including off-road vehicle activity; and
- introductions of nonnative plants, wildlife, or fish or other aquatic species, which can alter native habitats, out-compete, or prey upon native species.

We expect many of these activities will continue on state and private lands and could contribute to cumulative effects to the species within the Project action area.

Other reasonably foreseeable future activities include land development, fire management, irrigation, and recreational activities. Implementation of these projects will likely affect the environment through several mechanisms including water quality, water rights, and wildlife resources.

Cumulative effects to Colorado River fishes include the following types of impacts:

- changes in land use patterns that further fragment, modify, or destroy potential spawning sites, breeding sites, occupied habitat and designated critical habitat;
- shoreline recreational activities and encroachment of human development that remove upland or riparian/wetland vegetation and potentially degrade water quality;

- competition with, and predation by, nonnative fish species introduced by anglers or other sources; and
- additional water depletions reducing habitat quality and quantity.

As described in the Environmental Baseline section above, the Recovery Program has implemented various actions to offset many of the impacts associated with these types of projects. Such actions include securing instream flows, improving fish passage around fish barriers, reducing entrainment from diversions, removing nonnative fishes, and stocking of razorback sucker and bonytail chub to increase populations. We expect the implementation of Recovery Program actions will continue to offset adverse effects to Colorado River fishes associated with these types of projects.

6.0 CONCLUSION

After reviewing the information provided in the BA, the effects of the action, and cumulative effects, it is our biological opinion that the Project is not likely to jeopardize the continued existence of Colorado River fishes. In addition, it is our biological opinion that the Project does not result in destruction or adverse modification of designated critical habitat for Colorado River fishes. We reached this conclusion because the Recovery Program serves as an appropriate conservation measure for the 5.7 acre-feet water depletion associated with the Project and adequately addresses effects to the species and their designated critical habitats.

As explained in the Environmental Baseline section, the Recovery Program has a demonstrated record of successfully offsetting the adverse effects associated with water depletions throughout the Upper Colorado River Basin. Because of those successes, we conclude that the any adverse effects to Colorado River fishes and their critical habitats associated with water depletions from the Project would be offset by following Recovery Program guidelines.

7.0 INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and federal regulations pursuant to section 4(d) of the ESA 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. The regulations define harm as “an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering” (50 CFR section 17.3). Harass is defined by regulation as “an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering” (50 CFR section 17.3). Incidental take is defined as “...takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant” (50 CFR section 402.02).

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 ESA 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 so that they become binding conditions of any grant or permit issued to the Project proponent, as appropriate, for the exemption in section 7(o)(2) to apply. If there is failure to assume and implement the terms and conditions, or to require the Applicant to adhere to the terms and conditions of the Incidental Take Statement through enforceable terms that are added to any grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Refuge or the Applicant must report the progress of the action and its impact on the species to us as specified in the Incidental Take Statement [50 CFR section 402.14(i)(3)].

Amount or Extent of Take Anticipated

The following incidental take statement was in our October 31, 2014 BO. The only additions to this section in the amended BO is a discussion of the difficulty in quantifying take associated with water depletions.

Estimating the number of Colorado River fishes taken as a result of water depletions is difficult to quantify for the following reasons:

1. Determining whether an individual forwent breeding as a result of water depletions versus natural causes is extremely difficult to determine;
2. Finding a dead or injured listed fish is difficult due to the large size of the action area and because carcasses are subject to scavenging;
3. Natural fluctuations in river flows and species abundance may mask depletion effects; and,
4. Effects that reduce fecundity are difficult to quantify.

As discussed in the Upper Colorado Endangered Fish Recovery Program section above, the Recovery Program considers water depletions to adversely affect the four Colorado River fishes and their critical habitats. Because of the difficulty in quantifying take, the Recovery Program considers the water depletion amount as a surrogate measure of take (50 CFR section 402.14) and tracks the amount of new water depletions in the Upper Colorado River Basin each year. Therefore, we believe the level of take of these species can be monitored by tracking the amount of water reduction and the implementation of the Recovery Program is intended to minimize impacts of water depletions.

As such, we anticipate take in the form of harm for Colorado River fishes at all life stages that would occur from the removal of 5.7 acre-feet of water per year from the Upper Colorado River Basin. If the Recovery Program (and relevant measures under the Recovery Program) are not implemented, or if the anticipated level of water depletion is exceeded, we fully expect the level of incidental take to increase as well.

Water depletions above the 5.7 acre-feet per year addressed in this BO would exceed the anticipated level of incidental take and are not exempt from the prohibitions of section 9 of the Act. The Refuge is responsible for reporting to us if the Applicant exceeds the amount of average annual depletion. If the Applicant's water use exceeds 5.7 acre-feet for the Project, the Refuge should reinitiate section 7 consultation for the Project.

Effect of the Take

As described in the Conclusion section, we determined the Project is not likely to jeopardize the continued existence of Colorado River fishes and does not result in destruction or adverse modification of designated critical habitat for Colorado River fishes.

Reporting Requirements

If any Colorado River fishes, Uinta Basin hookless cactus, or Western yellow-billed cuckoo, are injured, damaged, or killed during construction activities, the Refuge must immediately notify our Utah Ecological Services Field Office at (801) 975-3330. Pertinent information including the date, time, and location shall be recorded and provided to us.

8.0 CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal Agencies to utilize their authorities to further the purposes of the ESA 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. Please note that new information indicates western yellow-billed cuckoo nesting can occur as early as June 1st. We recommend a nesting season avoidance period of June 1st to August 31st.

9.0 RE-INITIATION NOTICE – CLOSING STATEMENT

This concludes formal consultation on the proposed Project. As provided in 50 CFR section 402.16, reinitiation of formal consultation "...is required and shall be requested by the Federal agency or the Service, where discretionary Federal involvement or control over the action has been retained or is authorized by law" and:

1. If the amount or extent of taking specified in the Incidental Take Statement is exceeded.
2. If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered;
3. If the identified action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in this BO.
4. If a new species is listed or critical habitat designated that may be affected by the identified action.

To reinitiate section 7 consultation, the Refuge should immediately notify our office by phone or email if any of the four reinitiation clauses are triggered.

Thank you for your coordination in preparing the biological assessment and your interest in conserving threatened and endangered species. If we can be of further assistance, please contact Paul Abate at (385) 285-7907.

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