

DEPARTMENT OF THE INTERIOR**Fish and Wildlife Service****50 CFR Part 17**

[Docket No. FWS-R6-ES-2018-0081;
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RIN 1018-BD47

Endangered and Threatened Wildlife and Plants; Reclassification of the Humpback Chub From Endangered to Threatened With a Section 4(d) Rule

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), are reclassifying the humpback chub (*Gila cypha*) from endangered to threatened under the Endangered Species Act of 1973, as amended (Act), due to substantial improvements in the species' overall status since its original listing as endangered in 1974. This action is based on a thorough review of the best available scientific and commercial information available, which indicates that the humpback chub no longer meets the definition of an endangered species under the Act. The humpback chub will remain protected as a threatened species under the Act. We are also finalizing a rule under section 4(d) of the Act that provides for the conservation of the humpback chub.

DATES: This rule is effective November 17, 2021.

ADDRESSES: This final rule, supporting documents we used in preparing this rule, and public comments we received are available on the internet at <http://www.regulations.gov> under Docket No. FWS-R6-ES-2018-0081. Persons who use a telecommunications device for the deaf (TDD) may call the Federal Relay Service at 800-877-8339.

FOR FURTHER INFORMATION CONTACT: Tom Chart, Director, telephone: 303-236-9885. Direct all questions or requests for additional information to HUMPBACK CHUB QUESTIONS, U.S. Fish and Wildlife Service, Upper Colorado River Endangered Fish Recovery Program, P.O. Box 25486, DFC, Lakewood, CO 80225. Persons who use a TDD may call the Federal Relay Service at 800-877-8339.

SUPPLEMENTARY INFORMATION:**Executive Summary**

Why we need to publish a rule. Under the Act, if a species is determined to no longer be an endangered or threatened

species, we may reclassify the species or remove it from the Federal Lists of Endangered and Threatened Wildlife and Plants due to recovery. A species is an "endangered species" for purposes of the Act if it is in danger of extinction throughout all or a significant portion of its range and is a "threatened species" if it is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. We are reclassifying the humpback chub from endangered to threatened (*i.e.*, "downlisting") because we have determined that the species is no longer in danger of extinction throughout all or a significant portion of its range. Downlisting a species can only be completed by issuing a rule.

What this document does. This rule reclassifies the humpback chub from endangered to threatened (*i.e.*, to "downlists" the species), with a rule issued under section 4(d) of the Act, based on the species' current status, which has been improved through implementation of conservation actions.

The basis for our action. Under the Act, we can determine that a species is an endangered or threatened species based on any one or more of the following five factors or the cumulative effects thereof: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. Based on an assessment of the best available information regarding the status of and threats to the humpback chub, we have determined that the species no longer meets the definition of endangered under the Act, but does meet the definition of threatened.

We are promulgating a section 4(d) rule. The rule we are promulgating under section 4(d) of the Act ("4(d) rule") provides exceptions to take prohibitions for activities that will further recovery of the species. This final rule recognizes that, based on the best available science, the humpback chub no longer meets the definition of an endangered species, but will remain protected as a threatened species under the Act. This progress towards recovery is a result of conservation efforts implemented by stakeholders. Collaborative conservation efforts have reduced the intensity of threats to the species and improved its population numbers. The 4(d) rule will accommodate recovery activities such as nonnative control efforts, habitat

restoration, monitoring, research, stocking, and refuge maintenance.

Previous Federal Actions

On March 11, 1967, the Secretary of the Interior published a final rule (32 FR 4001) listing the humpback chub as an endangered species in accordance with the Endangered Species Preservation Act of 1966 (80 Stat. 926; 16 U.S.C. 668aa(c)). Subsequently, the humpback chub retained classification as an endangered species under the Endangered Species Conservation Act of 1969 (16 U.S.C. 668aa) and the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*), and on January 4, 1974, the species was included in a final rule (39 FR 1158) establishing a list of endangered native wildlife at 50 CFR part 17. On March 21, 1994, we designated critical habitat for humpback chub along 610 kilometers (km) (379 miles (mi)) of the Colorado River basin (59 FR 13374).

We issued the first recovery plan for the humpback chub on August 22, 1979. We revised the recovery plan on September 19, 1990, and we further amended and supplemented the 1990 revised plan with new recovery goals on August 1, 2002. The recovery criteria presented in the 2002 recovery plan remain reasonable measures to gauge progress towards recovery and a valuable reference as we refine our vision of recovery for the humpback chub, and work to update the recovery plan.

On January 22, 2020, we proposed to downlist the humpback chub from "endangered" to "threatened" (85 FR 3586). Please refer to that proposed rule for a detailed description of the Federal actions concerning this species that occurred prior to January 22, 2020.

Summary of Changes From the Proposed Rule

As explained below under Summary of Comments and Recommendations, we made several changes in this final rule in response to public comments we received on our January 22, 2020, proposed rule (85 FR 3586). In incorporating the primary changes resulting from public input, we:

- Completed minor editorial changes and reorganized various sections of the rule to increase readability;
- Updated population status for all extant populations to include the most recent monitoring data;
- Revisited the analysis of future water availability and included newly available climate information;
- Revisited management actions performed by the two multi-stakeholder programs and included analysis of

actions newly implemented or planned, including, but not limited to, actions affecting river flows, food supply, and nonnative fish;

- Considered new information regarding the continued existence of the Upper Basin Recovery Program and funding for the two multi-stakeholder programs implementing management actions to benefit humpback chub; and
- Revisited our analysis of the species' status in a significant portion of its range based on the ruling of the court in *Center for Biological Diversity v. Everson*, 2020 WL 437289 (D.D.C. Jan. 28, 2020).

We have incorporated this information below under Summary of Biological Status and Threats and Determination of Humpback Chub Status, in this rule. Additionally, we updated the species status assessment (SSA) report to clarify the historical and current species range (Service 2018b, entire).

Supporting Documents

A species status assessment (SSA) team prepared an SSA report for the humpback chub. The SSA team was composed of Service biologists, in consultation with other species experts. The SSA report represents a compilation of the best scientific and commercial data available concerning the status of the species, including the impacts of past, present, and future factors (both negative and beneficial) affecting the species.

In accordance with our joint policy on peer review published in the **Federal Register** on July 1, 1994 (59 FR 34270), and our August 22, 2016, memorandum updating and clarifying the role of peer review of listing actions under the Act, we sought peer review of the SSA report. The Service sent the SSA report to 3 independent peer reviewers and received 3 responses. The purpose of peer review is to ensure that our reclassification determinations and 4(d) rules are based on scientifically sound data, assumptions, and analyses. The peer reviewers have expertise in the biology, habitat, and threats to the species. The Service also sent the SSA report to over 25 State, Tribal, Federal, and private partners, including scientists with expertise in desert river biology, ecology, and hydrology, for review. We received review from 29 individuals across 12 partner organizations (Service 2018b, pp. iv–v).

Final Reclassification Determination Background

It is our intent to discuss only those topics directly related to downlisting humpback chub in this rule. The

citations represent only the sources required to support this action or to provide context for it, and are not the sum total of all literature pertaining to the species. For more information on the description, taxonomy, biology, ecology, and habitat of the species, please refer to the species status assessment (SSA) report for the humpback chub (Service 2018b, entire), as well as the materials cited in this rule. These documents will be available as supporting materials on <http://www.regulations.gov> under Docket No. FWS–R6–ES–2018–0081.

The humpback chub is a fish endemic to the warm-water portions of the Colorado River basin of the southwestern United States. The humpback chub lives in discrete, rocky, canyon-bound river reaches characterized by swift currents in portions of Utah, Colorado, and Arizona. Multiple adaptations allow the humpback chub to survive the highly variable flow conditions of these desert river ecosystems, such as a long lifespan of approximately 20 to 40 years, large body size up to 480 millimeters (mm) (19 inches (in)), high reproductive potential by producing up to 2,500 eggs per year, tolerance to a wide range of water qualities, and a variable diet.

There are currently five extant, or occupied, humpback chub populations: Desolation and Gray Canyons (the Green River in Utah), Black Rocks (the Colorado River in Colorado), Westwater Canyon (the Colorado River in Utah), Cataract Canyon (the Colorado River in Utah), and Grand Canyon (the Colorado and Little Colorado Rivers in Arizona). Although it provides suitable habitats for humpback chub, the Dinosaur National Monument population is extirpated. Five of these populations (the Dinosaur National Monument, Desolation and Gray Canyons, Black Rocks, Westwater Canyon, and Cataract Canyon populations) are in the upper basin, and one population (the Grand Canyon population) is in the lower basin.

Recovery

Section 4(f) of the Act directs us to develop and implement recovery plans for the conservation and survival of endangered and threatened species unless we determine that such a plan will not promote the conservation of the species. Under section 4(f)(1)(B)(ii), recovery plans must, to the maximum extent practicable, include objective, measurable criteria which, when met, would result in a determination, in accordance with the provisions of section 4 of the Act, that the species be removed from the List.

Recovery plans provide a roadmap for us and our partners on methods of enhancing conservation and minimizing threats to listed species, as well as measurable criteria against which to evaluate progress towards recovery and assess the species' likely future condition. However, they are not regulatory documents and do not substitute for the determinations and promulgation of regulations required under section 4(a)(1) of the Act. A decision to revise the status of a species, or to delist a species, is ultimately based on an analysis of the best scientific and commercial data available to determine whether a species is no longer an endangered species or a threatened species, regardless of whether that information differs from the recovery plan.

There are many paths to accomplishing recovery of a species, and recovery may be achieved without all of the criteria in a recovery plan being fully met. For example, one or more criteria may be exceeded while other criteria may not yet be accomplished. In that instance, we may determine that the threats are minimized sufficiently and that the species is robust enough that it no longer meets the definition of an endangered species or a threatened species. In other cases, we may discover new recovery opportunities after having finalized the recovery plan. Parties seeking to conserve the species may use these opportunities instead of methods identified in the recovery plan. Likewise, we may learn new information about the species after we finalize the recovery plan. The new information may change the extent to which existing criteria are appropriate for identifying recovery of the species. The recovery of a species is a dynamic process requiring adaptive management that may, or may not, follow all of the guidance provided in a recovery plan.

We published the first recovery plan for the humpback chub in 1979, and published an updated plan in 1990 (Service 1979; Service 1990). In 2002, the humpback chub recovery goals supplemented and amended the 1990 recovery plan, and provided objective and measurable demographic criteria and recommendations for site-specific management actions needed for recovery (Service 2002). For detailed description of recovery planning for the humpback chub and descriptions of the 2002 recovery criteria, please refer to the Recovery Planning and Recovery Criteria section in the January 22, 2020, proposed rule (85 FR 3586).

The current status of humpback chub partially meets the 2002 recovery

criteria. Many demographic criteria are met by the five extant populations of humpback chub, which have not declined significantly over the past decade. However, recovery criteria are not fully met because the adult population of Dinosaur National Monument declined and the population is now considered extirpated. We expect to revise the recovery plan for humpback chub when this rulemaking is complete in order to incorporate the new scientific information.

Regulatory and Analytical Framework

Regulatory Framework

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for determining whether a species is an endangered species or a threatened species. The Act defines an endangered species as a species that is “in danger of extinction throughout all or a significant portion of its range,” and a threatened species as a species that is “likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” The Act requires that we determine whether any species is an endangered species or a threatened species because of any of the following factors:

- (A) The present or threatened destruction, modification, or curtailment of its habitat or range;
- (B) Overutilization for commercial, recreational, scientific, or educational purposes;
- (C) Disease or predation;
- (D) The inadequacy of existing regulatory mechanisms; or
- (E) Other natural or manmade factors affecting its continued existence.

These factors represent broad categories of natural or human-caused actions or conditions that could have an effect on a species’ continued existence. In evaluating these actions and conditions, we look for those that may have a negative effect on individuals of the species, as well as other actions or conditions that may ameliorate any negative effects or may have positive effects. We consider these same five factors in downlisting a species from endangered to threatened (50 CFR 424.11(c) through (e)).

We use the term “threat” to refer in general to actions or conditions that are known to or are reasonably likely to negatively affect individuals of a species. The term “threat” includes actions or conditions that have a direct impact on individuals (direct impacts), as well as those that affect individuals through alteration of their habitat or

required resources (stressors). The term “threat” may encompass—either together or separately—the source of the action or condition or the action or condition itself.

However, the mere identification of any threat(s) does not necessarily mean that the species meets the statutory definition of an “endangered species” or a “threatened species.” In determining whether a species meets either definition, we must evaluate all identified threats by considering the expected response by the species, and the effects of the threats—in light of those actions and conditions that will ameliorate the threats—on an individual, population, and species level. We evaluate each threat and its expected effects on the species, then analyze the cumulative effect of all of the threats on the species as a whole. We also consider the cumulative effect of the threats in light of those actions and conditions that will have positive effects on the species, such as any existing regulatory mechanisms or conservation efforts. The Secretary determines whether the species meets the definition of an “endangered species” or a “threatened species” only after conducting this cumulative analysis and describing the expected effect on the species now and in the foreseeable future.

The Act does not define the term “foreseeable future,” which appears in the statutory definition of “threatened species.” Our implementing regulations at 50 CFR 424.11(d) set forth a framework for evaluating the foreseeable future on a case-by-case basis. The term “foreseeable future” extends only so far into the future as we can reasonably determine that both the future threats and the species’ responses to those threats are likely. In other words, the foreseeable future is the period of time in which we can make reliable predictions. “Reliable” does not mean “certain”; it means sufficient to provide a reasonable degree of confidence in the prediction. Thus, a prediction is reliable if it is reasonable to depend on it when making decisions.

It is not always possible or necessary to define foreseeable future as a particular number of years. Analysis of the foreseeable future uses the best scientific and commercial data available and should consider the timeframes applicable to the relevant threats and to the species’ likely responses to those threats in view of its life-history characteristics. Data that are typically relevant to assessing the species’ biological response include species-specific factors such as lifespan, reproductive rates or productivity,

certain behaviors, and other demographic factors.

Analytical Framework

The SSA report documents the results of our comprehensive biological review of the best scientific and commercial data regarding the status of the species, including an assessment of the potential threats to the species. The SSA report does not represent a decision by the Service on whether the species should be listed as an endangered or threatened species under the Act. It does, however, provide the scientific basis that informs our regulatory decisions, which involve the further application of standards within the Act and its implementing regulations and policies. The following is a summary of the key results and conclusions from the SSA report; the full SSA report can be found at Docket No. FWS–R6–ES–2018–0081 on <http://www.regulations.gov>.

To assess humpback chub viability, we used the three conservation biology principles of resiliency, redundancy, and representation (Shaffer and Stein 2000, pp. 306–310). Briefly, resiliency supports the ability of the species to withstand environmental and demographic stochasticity (for example, wet or dry, warm or cold years), redundancy supports the ability of the species to withstand catastrophic events (for example, droughts, large pollution events), and representation supports the ability of the species to adapt over time to long-term changes in the environment (for example, climate changes). In general, the more resilient and redundant a species is and the more representation it has, the more likely it is to sustain populations over time, even under changing environmental conditions. Using these principles, we identified the species’ ecological requirements for survival and reproduction at the individual, population, and species levels, and described the beneficial and risk factors influencing the species’ viability.

The SSA process can be categorized into three sequential stages. During the first stage, we evaluated the individual species’ life-history needs. The next stage involved an assessment of the historical and current condition of the species’ demographics and habitat characteristics, including an explanation of how the species arrived at its current condition. The final stage of the SSA involved making predictions about the species’ responses to positive and negative environmental and anthropogenic influences. Throughout all of these stages, we used the best available information to characterize viability as the ability of a species to

sustain populations in the wild over time. We use this information to inform our regulatory decision.

Summary of Biological Status and Threats

The following discussion is a summary of the results and conclusions from the SSA report for the humpback chub, which contains a more complete description of our scientific analysis (Service 2018b, *entire*).

For our analysis, we identified the species' ecological requirements for survival and reproduction at the individual, population, and species levels, and described the factors, both positive and negative, that influence the viability of the humpback chub, currently and into the future (Service 2018b, *entire*). We evaluated the species' current levels of resiliency, redundancy, and representation, and projected plausible changes to these "3Rs" into the future (Service 2018b, *entire*). Below, we summarize the results of our analysis. Please refer to the SSA report (Service 2018b, *entire*) and the Summary of Biological Status and Threats section in the proposed rule (85 FR 3586–3594; January 22, 2020) for a more detailed discussion of the factors affecting the humpback chub and its viability.

Summary of Species Needs

Individual humpback chub need diverse, rocky, canyon river habitat for spawning, rearing, feeding, and sheltering; suitable river flow and water temperature regimes for spawning, egg incubation, larval development, and growth; and an adequate and reliable food supply, including aquatic and terrestrial insects, crustaceans, and plant material (Service 2018b, pp. 15–33). Humpback chub populations need: Habitats with few predatory nonnative fish species, allowing the young to survive and recruit; suitable water quality with few toxic inputs, such as fire ash or other contaminants, supporting survival of all life stages; and unimpeded range and connectivity between discrete canyon habitats, providing free movement of individuals among populations. At the species level, the humpback chub needs multiple populations to provide adequate redundancy against potential catastrophic events and sufficient genetic diversity (representation) to ensure adaptive traits of the species (Service 2018b, pp. 15–33).

Summary of Species Current Condition

As documented in more detail in our SSA report (Service 2018b, *entire*), to evaluate the current condition of the

humpback chub, we evaluated a number of stressors that influence the resiliency of populations. The stressors that influence resiliency of humpback chub populations include river flows (Factor A) and predatory nonnative fish (Factor C) in the upper basin populations; and river flows (Factor A), water temperature (Factor A), food supply (Factor A), and predatory nonnative fish (Factor C) in the lower basin (Service 2018b, pp. 34–100). Some stressors, such as low river flows and warm water temperatures, may also act cumulatively to increase the impact of predatory nonnative fish. Certain needs or stressors require continued management, such as river flow and nonnative fish in all five extant populations, and water temperature and food supply in the Grand Canyon population. Ongoing management actions are primarily undertaken by two multi-stakeholder management programs, the Upper Colorado River Endangered Fish Recovery Program (Upper Basin Recovery Program) and the Glen Canyon Dam Adaptive Management Program (Glen Canyon Dam AMP). Below, we summarize the current condition for the species first in the upper basin and then in the lower basin, with more detail provided in our SSA report (Service 2018b, pp. 34–124).

Summary of Current Conditions in the Upper Basin—Currently, four populations of humpback chub occur in the upper basin (Desolation and Gray Canyons, Black Rocks, Westwater Canyon, and Cataract Canyon), with one additional extirpated population (Dinosaur National Monument). The Upper Basin Recovery Program's conservation and management actions have maintained and improved resource conditions for humpback chub populations in the upper basin over the last 15 years. The Westwater Canyon population has increased substantially over the past 5 years (Hines *et al.* 2020, pp. 10, 28, 32), and the Black Rocks populations has remained stable (Francis *et al.* 2021, pp. 36–38). The best available information indicates that the Desolation and Gray Canyons, and Cataract Canyon populations are also stable (Ahrens 2019, pp. 2, 7; Caldwell 2021, p. 17). Currently, management actions in the upper basin have improved river flows such that habitats are suitable to support humpback chub populations. Although nonnative predatory fish species that prey on humpback chub, such as northern pike (*Esox lucius*), walleye (*Sander vitreus*), and smallmouth bass (*Micropterus dolomieu*), have been documented near multiple humpback chub populations,

the upper basin populations are largely free of these predators. Below, we summarize the condition of humpback chub habitats and populations in the upper basin, with additional detail provided in the SSA report (Service 2018b, pp. 34–124).

In the upper basin, the four extant populations (Desolation and Gray Canyons, Black Rocks, Westwater Canyon, and Cataract Canyon) and one extirpated population (Dinosaur National Monument) currently have high-quality rocky canyon habitat, an adequate food base, and unimpeded connectivity (Service 2018b, pp. 83–85). Federal, State, and Tribal land ownership largely protects the humpback chub's canyon habitats in the upper basin, and recreation is the primary activity in these canyons. Water temperature is suitable and unaltered by reservoir releases in the upper basin, except for a portion of the extirpated Dinosaur National Monument population in the Green River that is cooled by releases from the Flaming Gorge Dam. Fish passage structures ensure movement can occur between the populations in the upper basin (Service 2018b, pp. 83–85).

The stressors of highest concern to the humpback chub in the upper basin are reduced river flows and predatory, nonnative fish. Over the last 50 years, the operation of large, Federal dams altered river flows and temperature regimes of upper basin rivers by reducing spring peak flows and increasing summer and winter base flows, conditions generally unsuitable for humpback chub. Additionally, large municipal and agricultural water withdrawals during the 20th century reduced the amount of water in the upper basin rivers. Water withdrawals have remained relatively stable over approximately the last 20 years (Colorado Water Conservation Board 2019, p. 1; 2020 p. 1; Wyoming Solar Energy Association 2019, p. 3), while severe and persistent drought has reduced water supply in the upper basin since 2000 (Udall and Overpeck 2017, p. 2406; Williams *et al.* 2020, p. 315). Climatic warming and increased evapotranspiration have exacerbated declines in precipitation since 2000 (Milly and Dunne 2020, pp. 1252–1254; Williams *et al.* 2020, pp. 314–317), resulting in reduced water availability to the upper basin rivers (Udall and Overpeck 2017, pp. 2404–2406) used by the humpback chub.

The humpback chub evolved in an environment relatively free of predators and competitors, so the species is ill-adapted to live with the many nonnative fish that have been introduced into the

Colorado River basin. The humpback chub is a soft-rayed fish with no defense mechanisms to protect itself from nonnative predatory fish species. Over 50 nonnative fish species have been introduced into the upper basin, some of which prey on or compete with young humpback chub, thereby reducing survival rates of juvenile humpback chub. Smallmouth bass present the largest predatory threat to native fish in the upper basin (Johnson *et al.* 2008, p. 1946), but northern pike and walleye are also problematic nonnative predators. Humpback chub are at most risk from predation if nonnative predators colonize their canyon habitats, which may result in severe, localized predation on young humpback chub. Nonnative predators can also emigrate from nearby source populations and exert predatory pressure on humpback chub populations. Adult northern pike and walleye migrate through upper basin humpback chub populations in low densities, but do not yet reside and reproduce in any population. Nearby populations of smallmouth bass have not colonized Black Rocks, Westwater Canyon, or Cataract Canyon, but have been collected there in low densities. Smallmouth bass inhabit and reproduce in Dinosaur National Monument and Desolation and Gray Canyons, and periodically increase in density in response to low river flows and warm water temperatures that promote their reproduction and growth. Although a concern, nonnative predators occur in low densities in humpback chub habitats in the upper basin but have not colonized these habitats.

The Upper Basin Recovery Program oversees management actions needed to improve conditions for the humpback chub in the upper basin. Over the past 15 years, the Upper Basin Recovery Program has implemented a large suite of actions to improve the resources of highest concern for humpback chub, including, but not limited to: providing and protecting river flows; managing and removing predatory, nonnative fish; and installing and operating fish passage structures.

Despite the severe drought experienced in the upper basin over the past 15 to 20 years, management of river flows has restored much of the important intra- and inter-annual variability of river flow that the humpback chub needs to breed, feed, and shelter. Changes in the operation of large Federal dams and provision of water dedicated to environmental flows have managed flows to benefit the humpback chub. Despite a severe reduction in water availability due to

drought since 2000, water managers have provided flow regimes in upper basin rivers that support humpback chub. For example, both Flaming Gorge Dam (the Green River) and the Aspinall Unit (the Colorado River) changed operational release patterns in 2006 and 2012, respectively, to reduce adverse effects of altered flow regimes and to provide downstream flows to benefit the humpback chub and other fish species (Service 2018b, p. 39). Operational release patterns at Flaming Gorge Dam, implemented since 2006, have been evaluated for their effectiveness, and revised flow recommendations have been drafted to further improve river flow conditions for humpback chub and other fish species (LaGory *et al.* 2019, pp. 4–24, 5–6, 5–20–5–32). Implementing, evaluating, and revising flow recommendations demonstrates a commitment by stakeholders to provide flow regimes that benefit the humpback chub.

To maintain flows, the Upper Basin Recovery Program acquired water stored in reservoirs in the Yampa and Colorado Rivers and releases this water to support the humpback chub when needed, such as during low-flow periods during the summer (Service 2018b, p. 39). Stakeholders in the Upper Basin Recovery Program implement various other actions to improve flow conditions for humpback chub, such as voluntary releases of water to augment the spring peak on the Colorado River mainstem (Coordinated Reservoir Operations), which has occurred 12 times since 1997 (Service 2018b, p. 39). Furthermore, the Colorado Water Conservation Board holds instream flow water rights on two reaches of the Colorado River to maintain minimum flows in the river, which may benefit downstream habitats and designated critical habitat for humpback chub.

In the upper basin, the Upper Basin Recovery Program also implements a comprehensive suite of nonnative fish management actions to limit predation by nonnative fish species (Service 2018b, p. 90). The two core actions to reduce predation of humpback chub are removing predatory fish from approximately 966 km (600 mi) of river and screening reservoirs to prevent predators from escaping into the downstream habitats used by humpback chub. Additionally, State partners in the Upper Basin Recovery Program no longer stock certain nonnative predators, and instead stock fish species that are more compatible with the recovery of humpback chub, such as sterile individuals that will not establish populations in river habitats. State partners also have implemented harvest

regulations that promote the removal of nonnative predatory fish throughout the upper basin, including sponsoring incentivized harvest in some locations.

Over the last 20 years, partners have installed five fish passage structures in the Colorado, Gunnison, and Green Rivers to provide ecological connectivity between the upper basin populations. Fish passages built by the Upper Basin Recovery Program partners allow humpback chub in all four extant upper basin populations to emigrate to any of the other three extant populations and the extirpated Dinosaur National Monument population. Unimpeded movement between all upper basin populations provided by the fish passage structures allows for genetic exchange and maintenance of genetic diversity of populations.

Upper basin populations have been monitored using catch per unit effort (CPUE) protocols since the mid-1980s, but more rigorous mark-recapture population estimation techniques began in some humpback chub populations in the late 1990s. Abundance estimates generally have some uncertainty, with wide confidence intervals in older estimates and more precision in recent estimates. Despite the uncertainty associated with population monitoring techniques, these abundance estimates and associated CPUE data provide important demographic information about humpback chub populations.

The Black Rocks and Westwater Canyon populations both declined from around year 2000, when they were first estimated, through about 2006, after which they both stabilized through about 2012 (Service 2018b, p. 101). The most recent preliminary estimates of the Black Rocks population, for years 2016 and 2017, indicate continued stabilization of the population at around 430 adults (Francis *et al.* 2021, pp. 36–38). A large group of juvenile humpback chub documented in 2017 may increase the size of the Black Rocks population in future years (Francis *et al.* 2021, pp. 36, 38). The most recent estimates of the Westwater Canyon population, for years 2016 and 2017, indicate the population increased substantially to around 3,300 adults (Hines *et al.* 2020, pp. 10, 28, 32), likely the result of several years of recruitment since 2015. For the last 19 years, adult survival for humpback chub in Black Rocks and Westwater Canyon was relatively stable around 75 percent (Hines *et al.* 2020, pp. 10, 33; Francis *et al.* 2021, pp. 39–40). Emigration of humpback chub between Black Rocks and Westwater Canyon demonstrate connectivity, with approximately 2 percent of each population emigrating to the other population each year, for a net

contribution of approximately 50 individuals a year to the Black Rocks population (Hines *et al.* 2020, p. 17; Francis *et al.* 2021, p. 41).

Adult abundance trends in Desolation and Gray Canyons are generally similar to those for Westwater and Black Rocks because they were highest around year 2000 and subsequently declined through about 2006 (Service 2018b, p. 101). However, estimates from 2001 to 2003 have low precision and did not employ the same sampling regime as subsequent sampling. Since 2003, when standardized sampling began, preliminary analysis of long-term demographic metrics, catch rates, and site-specific abundance estimates indicate that the Desolation and Gray Canyons humpback chub population is stable (Caldwell 2021, p. 17). Specifically, canyon-wide catch rates of adults and the proportion of first year adults have remained consistent (Caldwell 2021, pp. 17, 27–31). Using estimates from 2006 to 2019, the adult abundance trends for long-term monitoring sites in Desolation and Gray Canyons are stable or increasing (Caldwell 2021, pp. 17, 32–33). Results from standardized, long-term monitoring in 2018 and 2019 demonstrates that the Desolation and Gray Canyons population is likely stable.

The Cataract Canyon population is small, with fewer than 500 adults. Swift currents make this population difficult to monitor. Abundance of humpback chub in Cataract Canyon is estimated by CPUE rather than more robust mark-recapture techniques, which makes estimating a population trend for Cataract Canyon difficult. Monitoring efforts from 2017 documented the highest annual CPUE for humpback chub in Cataract Canyon over the last 26 years (Ahrens 2017, p. 7), and the CPUE measured in 2019 was also above average (Ahrens 2019, pp. 2, 10). Analysis of CPUE by year since the 1990s demonstrates the population is stable, as the CPUE for humpback chub in Cataract Canyon has been increasing, but not in a statistically significant manner (Ahrens 2019, pp. 2, 7). Additionally, new sampling techniques in 2017 and 2019 increased the ability to document the presence of juvenile humpback chub in Cataract Canyon (Ahrens 2017, p. 2; Ahrens 2019, p. 3).

Unlike the other four populations in the upper basin, the Dinosaur National Monument population is currently below detection limits for humpback chub and is now considered functionally extirpated. By 1998, humpback chub in Dinosaur National Monument were absent or rare in

habitats where the species was likely common in the 1940s (Tyus 1998, p. 192). The last collections of humpback chub in this population were in the Yampa River in 2004 (Service 2018b, p. 114) and in the Green River in 2006 (Bestgen and Irving 2006, p. 2). The decline of the humpback chub population in Dinosaur National Monument likely started with the treatment of the Green River with rotenone (a chemical used to kill fish) following the completion of Flaming Gorge Dam in 1962 (Service 2018b, p. 81). Starting in 1963, any remaining humpback chub in the Green River portion of the Dinosaur National Monument population were negatively affected for decades by the cold, stable releases from Flaming Gorge Dam. Since 2006, operational changes at Flaming Gorge Dam have improved the water temperature and flow conditions in the Green River so that they could be more suitable for humpback chub. These operational flow regimes at Flaming Gorge Dam have been evaluated and could be revised to further reduce impacts on humpback chub and other native fish species (LaGory *et al.* 2019, pp. 4–24, 5–6, 5–20–5–32).

Flows in the Yampa River portion of the Dinosaur National Monument population are largely unregulated, but the Yampa River has experienced large-scale water withdrawals and low river flows, especially in the early 2000s. The extreme low flows in 2002 likely resulted in the extirpation of the remaining humpback chub in the Yampa River and allowed smallmouth bass to proliferate throughout the upstream reaches. Since 2007, water acquired by the Upper Basin Recovery Program and released from Elkhead Reservoir has supported improved flow conditions in the Yampa River (Service 2018b, p. 39), but smallmouth bass continue to dominate the Yampa River upstream of humpback chub habitats.

Dinosaur National Monument may now have suitable resource conditions to support a reestablishment effort of humpback chub. The rocky canyon habitats preferred by the humpback chub are still present in Dinosaur National Monument, and the native fish community is largely intact. Although management actions have improved resource conditions in Dinosaur National Monument, immigration from other humpback chub populations is too low for the species to recolonize naturally, and the population is considered extirpated. Because habitats could potentially support a population, the Upper Basin Recovery Program has convened a team to consider translocation or stocking to restore the

humpback chub to the Dinosaur National Monument population.

Summary of Current Conditions in the Lower Basin—The lower basin has one large population of humpback chub located in the Grand Canyon. Resource conditions in the lower basin are of sufficient quality and quantity to support population resiliency. Humpback chub are reproducing in many of these broadly distributed areas, demonstrating that the species can complete its entire life history in multiple, diverse locations within the Grand Canyon in the lower basin. Below, we summarize current conditions for humpback chub in the lower basin, with additional detail provided in the SSA report (Service 2018b, pp. 34–124).

Although the Grand Canyon population is the only humpback chub population in the lower basin, the population is large and includes: A core population area in the Little Colorado River and nearby mainstem Colorado River; a recent range expansion into western Grand Canyon; and individuals translocated into tributary habitats in Havasu Creek and the upper Little Colorado River. The Grand Canyon population has high-quality canyon reaches that provide unimpeded connectivity between its habitats. In this population, there are no barriers to movement, except for those created by natural falls or chutes in tributary habitats. Translocated humpback chub placed above these natural barriers helped improve redundancy of humpback chub populations in the lower basin. Landownership surrounding the Grand Canyon population is Federal and Tribal, so human access and use are well-regulated.

The stressors of highest concern to humpback chub in the lower basin are altered river flows, reduced water temperature, inadequate food supply, and predatory nonnative fish. Releases from the Glen Canyon Dam alter the flow and temperature regimes of the Colorado River throughout much of the Grand Canyon population by reducing spring peaks, increasing base flows, and cooling the river through much of the year. Despite flow and temperature changes, humpback chub continue to use the mainstem near the mouth of the Little Colorado River for all life stages, except spawning, egg incubation, and larval development, which occur primarily in the Little Colorado River (Service 2018b, p. 59). Furthermore, the species has recently expanded into the western Grand Canyon (Van Haverbeke *et al.* 2017; Rogowski *et al.* 2018, p. 26) as the elevation of Lake Mead has

receded, possibly the result of warmer water temperatures in the mainstem portion of the river (Van Haverbeke *et al.* 2017, p. 285).

The Long-Term Experimental and Management Plan prescribes the release patterns from the Glen Canyon Dam, helping to reduce and minimize impacts to humpback chub habitats in the Grand Canyon (U.S. Department of the Interior (DOI) 2016, pp. 1–2). Starting in 2004, the temperature of water released through the Glen Canyon Dam increased in the summer and fall periods to 16 degrees Celsius (°C) (61 degrees Fahrenheit (°F)). Warmer temperatures generally allow individual humpback chub to grow larger and more quickly, but warmer water may also allow predatory, nonnative fish to invade and expand into humpback chub habitats.

Predatory nonnative fish in the lower basin include warm-water species that have escaped from Lake Powell and cold water salmonids such as brown trout (*Salmo trutta*) and rainbow trout (*Oncorhynchus mykiss*) that prey on juvenile humpback chub in the cold tailwaters of Glen Canyon Dam (Ward and Morton-Starnier 2015, p. 1184). Although these two predators overlap with humpback chub in portions of the mainstem Colorado River, the predators are concentrated in the colder water immediately below Glen Canyon Dam and tributaries of the Colorado River in the Grand Canyon, so are not distributed fully throughout humpback chub habitats in the lower basin. The majority of the areas inhabited by humpback chub, including the Little Colorado River and western Grand Canyon, are dominated by native fish (Pillow *et al.* 2018, p. 7; Stone *et al.* 2018, p. 119; Van Haverbeke *et al.* 2019, p. 8; Kegerries *et al.* 2020, p. 146; Van Haverbeke *et al.* 2020, p. 8). Nonnative fish are likely limited by abiotic (physical) factors in the Little Colorado River, such as carbon dioxide and sediment regimes, which allows humpback chub and other native fish species to dominate this important habitat (Stone *et al.* 2018, p. 119). Similarly, turbidity could be limiting nonnative species in the western Grand Canyon allowing for humpback chub range expansion (Kegerries *et al.* 2020, pp. 152–154).

In the lower basin, the Glen Canyon Dam AMP coordinates the protection of natural resources of the Colorado River flowing through the Grand Canyon, including the humpback chub, from Glen Canyon Dam to the Lake Mead inflow. Actions undertaken to support recovery of humpback chub include, but are not limited to: Management actions to reduce nonnative fish species; altering dam releases to study possible

improvements of important food sources for humpback chub, such as mayflies, stoneflies, and caddisflies; and the translocation of humpback chub to new habitats.

In the lower basin, management actions are geared toward the removal of both warm water and cold water nonnative fish species, but these actions do not occur unless predetermined conditions are met (DOI 2016, pp. B–22–B–31; NPS 2018, pp. 7–26). Removal of nonnative trout occurs in locations managed for humpback chub, but, currently, removal of nonnative species in the lower basin occurs only in Bright Angel Creek. The National Park Service (NPS) has recently implemented an “Expanded Nonnative Species Management Plan” to prevent, control, minimize, or eradicate potentially harmful nonnative aquatic species (NPS 2018, p. 1). Recent increases in the nonnative green sunfish (*Lepomis cyanellus*) and brown trout in the Glen Canyon reach have raised concerns about risks to humpback chub and have prompted NPS to consider additional tools and new approaches to control nonnative aquatic species (NPS 2018, pp. 1–3).

In the lower basin, temperature, daily flow variation, and competition with other fish species influence the aquatic food base available to humpback chub, which may limit the size of the Grand Canyon population of humpback chub. Dam releases for hydropower production that match intra-daily electrical demand, a process known as “hydropeaking,” could limit the availability of important macroinvertebrates eaten by humpback chub and other native fish species, by desiccating insect eggs that are laid during high water periods but then are exposed as flows recede (Miller *et al.* 2020, p. 584). It is unclear if hydropeaking reduces the availability of aquatic insects for humpback chub in the Grand Canyon (Kennedy *et al.* 2016, p. 1), so the Glen Canyon Dam AMP is testing a series of flows specifically to improve the production of macroinvertebrates. The experiments are ongoing and it is unclear if these production flows have increased long-term macroinvertebrate density (Kennedy and Meuhlbauer 2020, pp. 12–20) or improved condition of humpback chub.

Since 2003, partners in the Glen Canyon Dam AMP have translocated humpback chub to tributaries of the Colorado River to establish population redundancy and introduce humpback chub to areas with low densities of nonnative fish. Humpback chub translocated upstream in the Little

Colorado River above Chute Falls, a natural barrier to fish movement, demonstrated higher growth rates and earlier sexual maturity than those below the falls, and are also likely reproducing in the translocation area (Stone *et al.* 2020, p. 1). A 3-year effort to introduce humpback chub into Shinumo Creek in the lower basin indicated that the tributary provided favorable conditions for growth and survival despite high emigration rates (Spurgeon *et al.* 2015, p. 502), but a 2014 fire and subsequent flooding extirpated humpback chub from the area (Healy *et al.* 2020a, p. 9). A later effort in Havasu Creek found that translocated individuals survived and grew at rates that matched the Little Colorado River core population, and these individuals potentially established a self-sustaining population (Healy *et al.* 2020a, pp. 1–2). In addition, humpback chub were translocated into Bright Angel Creek in 2018 and 2020, and evaluation is underway (Healy *et al.* 2020b, pp. 3–5). These efforts indicate that humpback chub tolerates translocation for conservation, which may be an important tool to its recovery in the future.

The lower basin’s Grand Canyon population of humpback chub is the largest and most extensively distributed population of all the populations across the species’ range, with broadly distributed groups of humpback chub in mainstem and tributary habitats between Glen Canyon Dam and Lake Mead. The core area includes the Little Colorado River and nearby portions of the mainstem Colorado River. A substantial population decline occurred in the Little Colorado River during the 1990s, followed by a strong increase around 2007 (Van Haverbeke *et al.* 2019, pp. 21, 41). This core group remained relatively stable from 2008 to 2014, with a high abundance of approximately 11,500 to 12,000 adults (Service 2018b, pp. 117–119; Van Haverbeke *et al.* 2019, p. 41). Significantly lower abundance estimates in 2015 and 2016 likely resulted from humpback chub remaining in the mainstem Colorado River (Van Haverbeke *et al.* 2019, p. 25), not a reduction in population size. Since 2017, spring adult and subadult abundances equal or exceed previous estimates (Van Haverbeke *et al.* 2019, pp. 8, 41–42), demonstrating this population continues to be large and stable. Increases in adult abundance after 2006 were likely due to increased recruitment corresponding with warmer temperatures of released water and reduced nonnative, predatory trout numbers near the confluence with the Little Colorado River.

In addition to the core population in and near the Little Colorado River, the Grand Canyon population also has multiple aggregations of adult and subadult humpback chub distributed in the mainstem Colorado River. Humpback chub catch rates within these aggregations have increased significantly since 2010, especially in western Grand Canyon (Van Haverbeke *et al.* 2020, pp. 9, 31). In fact, relatively large numbers of humpback chub in the western Grand Canyon, including age-0 individuals (life stage after larvae, within the first year of life), downstream of Diamond Creek indicate the likelihood of a new subpopulation (Van Haverbeke *et al.* 2017, pp. 285, 288–289; Rogoswki *et al.* 2018, pp. 26, 33–34). Length frequencies for the humpback chub in western Grand Canyon indicate local, natural recruitment (Van Haverbeke *et al.* 2017, p. 288; Rogoswki *et al.* 2018, p. 34). Evidence of reproduction and recruitment that does not appear to be reliant on the Little Colorado River indicates that the western Grand Canyon is likely a second, subpopulation in the lower basin, which would improve redundancy in the lower basin.

Lastly, translocation efforts are potentially establishing a third, smaller subpopulation in Havasu Creek. Beginning in 2016, natural recruitment to sexual maturity of humpback chub that were produced in Havasu Creek occurred simultaneously with increases in abundance for this population (Healy *et al.* 2020a, pp. 2, 8). Although the Havasu Creek population is still new and its long-term success is not guaranteed, it provides additional redundancy to the Grand Canyon population, the lower basin, and the species.

Summary of Species' Current Condition—The humpback chub has many traits that enable individuals to be resilient in the face of environmental or demographic stochasticity, including a long life span, high reproductive potential, use of habitats and water quality that are arduous to other fish species, adaptation to a wide variety of flow and thermal regimes, and a variable omnivorous diet. Population resiliency is demonstrated by the stability of small populations (Cataract Canyon), population increases after previous declines (Grand Canyon and Westwater Canyon), population establishment after translocations (Havasu Creek), expansion into new areas (western Grand Canyon), and stabilization after previous declines (Black Rocks). In addition, the large population size of the Little Colorado River portion of the Grand Canyon

population in the lower basin reduces risk from stressor and environmental stochasticity. Similarly, the large Westwater Canyon population supports a strong core population in the upper basin.

The current distribution of the humpback chub in five extant populations across the upper and lower basins, with new populations emerging in the lower basin, provides redundancy for the humpback chub and reduces catastrophic risk. The distribution of the four extant populations in the upper basin across different river basins and many miles of rivers also reduces catastrophic risk. Black Rocks and Westwater Canyon are the only two populations that are in relatively close proximity. In the lower basin, the single humpback chub population is large and widespread, a distribution that provides redundancy and reduces catastrophic risk to the species. In the lower basin, humpback chub may be expanding their range into western Grand Canyon and reproducing in newly established locations, such as Havasu Creek, which may also provide redundancy to the large Little Colorado River core area.

Humpback chub populations also have adequate representation, as the multiple populations distributed across the range support the species' genetic diversity. The species' genetic diversity has not declined over the past decade (Bohn *et al.* 2019, p. 25). Upper basin populations are generally more diverse than the lower basin population, demonstrating adequate exchange of individuals between populations in the upper basin (Bohn *et al.* 2019, pp. 8, 24–25). Recent analysis recommends that genetic diversity of the species be managed as three units: Upper Colorado River (Cataract Canyon, Black Rocks, and Westwater Canyon), Green River (Desolation and Gray Canyons), and the Lower Basin (Grand Canyon and tributaries) (Bohn *et al.* 2019, p. 8).

Summary of Future Conditions—In our SSA report, we evaluated future conditions for the humpback chub using projections for the stressors, habitat factors, and demographic factors that influence its resiliency, redundancy, and representation (Service 2018b, pp. 125–153). For this species status assessment, we defined viability as the ability of the species to sustain populations in natural ecosystems over a biologically meaningful timeframe, in this case, 16 and 40 years into the future. These timeframes are periods that allow us to reasonably project the potential effects of various stressors within the range of the species and account for multiple generations of the humpback chub. These projections are

consistent with the time scale for which we have data available on the species and its stressors. We projected the resiliency, redundancy, and representation of the humpback chub under three plausible future scenarios, both 16 and 40 years into the future. We developed future scenarios to help capture uncertainty associated with the future and describe the range of plausible future conditions within the overall range of the humpback chub. Below, we summarize the three future scenarios that we used to evaluate a range of plausible future conditions for the humpback chub, which are discussed in greater detail in our SSA report (Service 2018b, pp. 134–135).

Future Scenario 1 describes a reduction or elimination in current voluntary management actions for the species, but recognizes that conservation actions established under binding operational plans and agreements would continue; as such, Scenario 1 describes a plausible future with reduced conservation actions. Future Scenarios 2 and 3 include the established management actions undertaken in Scenario 1, along with currently implemented voluntary management actions, and additional proactive and adaptive management actions that may be needed in the future; both Scenarios 2 and 3 are plausible futures with continued commitment to conservation actions. Scenarios 2 and 3 differ in their confidence in the effectiveness of the conservation actions: Scenario 2 considers that implemented actions are not fully effective to mitigate impacts of drought, future water development, nonnative fishes, or other threats, whereas Scenario 3 considers that implemented actions are sufficient to mitigate impacts of drought, future water development, nonnative fishes, and other threats. Scenarios 2 and 3 were developed to recognize the uncertainty concerning management actions' ability to mitigate stressors impacting humpback chub, especially future water availability and nonnative fish.

Under Scenario 1, conditions would severely degrade within both 16 and 40 years, primarily in the upper basin because collaborative partnerships would be eliminated or reduced. However, if collaborative partnerships remain in place and their conservation actions are effective as described under Scenario 3, resource conditions improve at 16- and 40-year timeframes. Under Scenario 2, degradation of resources takes place, even as conservation actions continue, resulting in neutral conditions within 16 years, but poor

conditions within 40 years. Although there is high uncertainty regarding resource conditions under Scenario 2 at 40 years, extrapolation of the expected resource conditions from 2034 onward demonstrates a continuing decline in resource conditions. The potential extirpation of multiple populations could most likely occur in the upper basin under the short 16-year timeframe in Scenario 1 and the longer 40-year timeframe under Scenario 2. Under Scenario 3, ongoing threat management proves successful in the long term, improving resource conditions. The health (resiliency) and distribution (redundancy) of all five extant populations reduces the risk from a potential catastrophic event under Scenario 3.

Scenarios 1 and 2 projected that within 40 years the populations and overall viability of humpback chub would be at increased risk and could decline (Service 2018b, pp. 159–163). Future conditions for humpback chub would only improve under Scenario 3 if long-term management actions are successful. The SSA report contains a more detailed discussion of our evaluation of the biological status of the humpback chub and the influences that may affect its continued existence (Service 2018b, pp. 154–163).

New Scientific Information—New scientific and commercial data completed after the SSA report (Service 2018b, entire) helps improve our understanding of the humpback chub and the management actions needed to conserve the species. We included this new information above in our summary of current conditions for both the upper and lower basins. Since 2018, new monitoring data indicates that all four extant upper basin populations are likely stable or increasing, reducing the uncertainty of the trajectory of these populations. In the lower basin, monitoring indicates that the Little Colorado River core area is stable, that humpback chub have expanded their range into western Grand Canyon, and that a translocated population in Havasu Creek is naturally recruiting. Population demographics for all extant populations of the species indicates that management actions enacted recently, such as operational flow regimes from dams and nonnative fish removal, are assisting the species. This information increases support for Scenario 3, as continued management actions in both basins are resulting in improved population resiliency across the current range of the species.

To date, the Upper Basin Recovery Program has not been formally extended and is scheduled to expire in 2023, so

Scenario 1 in the SSA report (2018b, entire), with its reduction of conservation efforts, remains plausible. Partners are committed to implementing recovery actions after 2023, as demonstrated by their ongoing negotiations to define the future of the partnership. However, until the structure and funding for this partnership is defined, the analysis of future conditions under Scenario 1 as presented in the SSA report (Service 2018b, entire) remains unchanged.

The purpose of the SSA was to characterize the current and future viability of the humpback chub in terms of the 3Rs, considering the potential current and future effects of stressors. In our SSA report, we described the current condition and three plausible future conditions for the humpback chub in terms of its resiliency, redundancy, and representation (Service 2018b, entire).

We note that, by using the SSA framework to guide our analysis of the scientific information documented in the SSA report, we have not only analyzed individual effects of stressors on individuals, populations, and the species, but we have also analyzed their potential cumulative effects. We incorporate the cumulative effects into our SSA analysis when we characterize the current and future condition of the species across the upper and lower basins and five populations. Our assessment of the current and future conditions encompasses and incorporates the threats individually and cumulatively (Service 2018b, entire). Our current and future condition assessment is iterative because it accumulates and evaluates the effects of all the factors that may be influencing the species, including negative influences from stressors and positive influences from conservation efforts. We evaluate potential effects from these influences consistently across the same subset of habitat and demographic needs for the species, both currently and into the future. Because the SSA framework considers not just the presence of the factors, but also to what degree they collectively influence risk to the entire species, our assessment integrates the cumulative effects of the factors and replaces a standalone cumulative effects analysis.

In our determination, we correlate the threats acting on the species to the factors in section 4(a)(1) of the Act. We summarize the status assessment for the humpback chub below.

The biological information we reviewed and analyzed as the basis for our findings is documented in the SSA report (Service 2018b, entire), a

summary of which is provided above. The projections for the future condition of the species are based on our expectations of the potential stressors that may affect the humpback chub. The potential stressors we evaluated in detail in the SSA report (Service 2018b, entire) that fall under Factors A, B, C, and E of the Act are: River flows (Factor A) and predatory nonnative fish (Factor C) in the upper basin populations; and river flows (Factor A), water temperature (Factor A), food supply (Factor A), and predatory nonnative fish (Factor C) in the lower basin population (Service 2018b, pp. 34–100). Existing regulatory mechanisms (Factor D) are discussed below.

Some stressors, such as low river flows and warm water temperatures, may also act cumulatively to increase the impact of predatory nonnative fish. Certain needs or stressors require continued management, such as river flow and nonnative fish in all five extant populations, and water temperature and food supply in the Grand Canyon population. Ongoing management actions are primarily undertaken by two multi-stakeholder management programs, the Upper Colorado River Endangered Fish Recovery Program (Upper Basin Recovery Program) and the Glen Canyon Dam Adaptive Management Program (Glen Canyon Dam AMP).

Our analysis found that the primary drivers for the humpback chub's current and future condition are diminishing river flow (Factor A), increasing water temperature (Factor A), expanding populations of nonnative fish (Factor C), and food availability in the Grand Canyon (Factor A). Low river flows and warm water temperatures may also act cumulatively to increase predation by nonnative predators. We summarize these stressors below, with more detail provided in the SSA report (Service 2018b, pp. 126–133).

River flow and temperature—The presence and operation of large dams alters suitable river flow and temperatures. Historically, dam operations did not always provide river flow conditions that supported humpback chub, but recent modifications to operations have reduced some impacts from the presence of dams. In the upper basin, modifications including restoring much of the important intra- and inter-annual variability of river flow have helped improve conditions for the humpback chub. Revised operational regimes are subsequently monitored, evaluated, and revised for their effectiveness to improve conditions for the humpback

chub (LaGory *et al.* 2019, pp. 4–24, 5–6, 5–20–5–32).

We also evaluated how the effects of climate change could impact river flows and water temperatures by using hydroclimate projections of future water resources in the Colorado River basin. Hydroclimate projections predict that decreased warm-season runoff will reduce water supply, primarily from increased frequency and severity of drought, which will further result in warmer water temperatures (U.S. Bureau of Reclamation 2016, pp. i–ii). Climatic warming and increased evapotranspiration are expected to exacerbate a decline in water supply beyond declines in precipitation (Udall and Overpeck 2017, pp. 2404–2406; Milly and Dunne 2020, pp. 1252–1254; Williams *et al.* 2020, pp. 314–317). Warmer, lower flows in the upper basin increase the risk of nonnative fish species impacting humpback chub populations by supporting the growth and reproduction of smallmouth bass. Warmer releases from Lake Powell could also impact abundance and distribution of nonnative fish in the Grand Canyon.

Currently, river flow conditions and temperatures are largely adequate for humpback chub in both the upper and lower basins because reservoir managers have exercised flexibility in their operations to support humpback chub while meeting downstream delivery obligations. Furthermore, current river flow conditions have supported native fish strongholds in humpback chub habitats despite nearby populations of predatory nonnative fish. Future river flow and temperature conditions are uncertain because regional climatic patterns predict reduction in water availability that may exceed the ability of operational flexibility to provide adequate flows.

Food availability—Humpback chub require an adequate and reliable food supply, which can consist of a variety of insects, crustaceans, and plants. Food is supplied by the instream production of invertebrates, insect emergences, and floods laden with debris. In the upper basin, although food supply has not been measured, it is not estimated to be a limiting factor. Conversely, below Glen Canyon Dam in the lower basin, the condition of the humpback chub populations is hypothesized to be impacted by low aquatic insect diversity and stream productivity. To improve egg-laying conditions for aquatic insects, the primary food source for the humpback chub in the Colorado River, the Glen Canyon Dam AMP is conducting experiments to evaluate densities of macroinvertebrates under

various flow regimes (Kennedy and Meuhlbauer 2020, pp. 12–20) to see if they will appreciably improve humpback chub condition. Therefore, low food availability could be a stressor to the species in the lower basin.

Predation—Predation and competition by nonnative fish are stressors to humpback chub in both the upper and lower basins. Juvenile humpback chub are vulnerable to predation from predatory, nonnative fish during the first few years of life. Nonnative fish can also compete for resources with adult humpback chub, reducing the ability of the humpback chub to breed, feed, and shelter. Although the humpback chub has no natural defense mechanism to protect itself from nonnative predators, the more arduous hydrological conditions of the humpback chub's canyon habitats are less favorable to the nonnative predators, which may limit the effects of nonnative fish. However, predation from nonnative fish may also increase when warm water temperatures act cumulatively with low flows.

In the upper basin, predation and competition by nonnative fish, particularly smallmouth bass, walleye, and northern pike, are potential threats to the viability of humpback chub. All upper basin humpback chub populations have dense nonnative predator populations nearby and experience predation pressure when adult predators emigrate. However, only the extant Desolation and Gray Canyons and the extirpated Dinosaur National Monument experience localized reproduction of smallmouth bass. Smallmouth bass colonization of multiple humpback chub populations would significantly decrease the viability of the species in the upper basin, but this has not yet occurred. In-river removal of nonnative predators focused on disrupting spawning successfully reduces adult densities of northern pike (Bestgen *et al.* 2020, pp. 11–12) and smallmouth bass (Hawkins 2019, pp. 12, 23) in certain reaches of the upper basin, but environmental conditions conducive to reproduction can produce strong year classes of young fish. This demonstrates that long-term commitment to nonnative predator control can improve conditions for the humpback chub and other native fish, but must be performed consistently in order to control nonnative fish populations. Commitments to multifaceted management of nonnative fish has reduced the threat posed by nonnative predators in the upper basin, but if management actions decrease, the threat would likely increase.

In the lower basin, current densities of nonnative predators are low in areas inhabited by humpback chub, such as the Little Colorado River and western Grand Canyon, likely because of abiotic factors, such as turbidity, water chemistry, and temperature (Pillow *et al.* 2018, p. 7; Van Haverbeke *et al.* 2019, p. 8; Kegerries *et al.* 2020, p. 146). Management actions in place to prevent and respond to establishment of new species, including the NPS “Expanded Nonnative Species Management Plan,” provides additional tools and new approaches for controlling nonnative aquatic species (NPS 2018, pp. 1–3). Recent increases in brown trout density in the Lees Ferry reach of the Colorado River and the discovery of green sunfish immediately below Glen Canyon Dam demonstrate that risks do exist in the lower basin, but these risks are currently upstream of humpback chub habitats. Lower elevations of Lake Powell enhance risk of warm water nonnative predator establishment in the Grand Canyon via increased risk of fish escaping through Glen Canyon Dam and warmer water releases that support nonnative predators.

Currently, nonnative fish moderately impact two (one extant and one extirpated) populations of humpback chub, while the remaining four extant populations are not currently being impacted. The threat of nonnative fish is being managed in the upper basin through multifaceted management actions, including but not limited to in-river nonnative predator removal, active flow management, and reservoir containment. In the lower basin, abiotic conditions currently limit the threat of nonnative fish. There remains risk for future increases in impacts from nonnative fish caused by altered flow conditions, but the magnitude of these impacts is uncertain. Therefore, nonnative predatory fish are not currently a threat to the species, but could become a threat in the future if management actions decrease.

Regulatory mechanisms—Regulatory mechanisms (Factor D) and other management efforts benefit the humpback chub. Most resources affecting humpback chub are strictly regulated through Federal, State, and Tribal mechanisms. Humpback chub are considered a sensitive species in Utah (Utah Division of Wildlife Resources 2017, p. 2), a State threatened species in Colorado (Colorado Parks and Wildlife 2020, p. 3), a Tier 1 vulnerable species in Arizona (Arizona Game and Fish 2019, p. 32), and an endangered species under Navajo Nation Code (Navajo Nation 2020, p. 2), which provide various protections within those

boundaries. The humpback chub's canyon habitats are largely protected by Federal, State, and Tribal land ownership, and humans primarily use humpback chub habitats for recreation. Releases from large dams, primarily operated by the U.S. Bureau of Reclamation (USBR), are now operated to promote river function and fish habitat under binding operational and management plans described in the Records of Decision for the Aspinall Unit (USBR 2012, p. 1), Flaming Gorge Dam (USBR 2006, pp. 1–2), and Glen Canyon Dam (DOI 2016, pp. 1–2). In the upper basin, the Colorado Water Conservation Board holds instream flow water rights on two reaches of the Colorado River to maintain minimum flows in the river, which may benefit downstream-designated critical habitat for the humpback chub. Water use and delivery in the Colorado River basin is strictly regulated under existing Federal, State, and Tribal laws commonly referred to as the “Law of the River,” including, but not limited to, the Colorado River Compact of 1922, the Upper Colorado River Basin Compact of 1948, the Colorado River Storage Project Act of 1956, the Colorado River Basin Project Act of 1968, and individual State and Tribal statutes that regulate water appropriation.

The Upper Basin Recovery Program and Glen Canyon Dam AMP are key regulatory mechanisms that shape the current and future condition of humpback chub. These programs are considered regulatory mechanisms because they are authorized through, and comply with, Federal legislation and the Law of the River. The Upper Basin Recovery Program was authorized under Public Law 106–392 and has been renewed on a periodic basis by acts of Congress. The Glen Canyon Dam AMP was established under the Record of Decision to operate Glen Canyon Dam needed to comply with the Grand Canyon Protection Act of 1992 (USBR 1996, pp. G–3–G–4), and funding for the program was authorized under Public Law 106–377. The Upper Basin Recovery Program coordinates and implements the majority of management actions in the upper basin, while the Glen Canyon Dam AMP undertakes management actions for the mainstem Colorado River in the lower basin. For example, both programs provide adequate habitat conditions by managing river flow and water temperature and by managing nonnative fish species. Conservation efforts implemented by the two programs over the past three decades demonstrate the

success of these collaborative partnerships.

The cooperative agreement implementing the Upper Basin Recovery Program was first signed in 1988, extended in 2001 and 2009, and is scheduled to expire in 2023. Expiration in 2023 creates uncertainty for continued implementation of conservation efforts. However, commitment to continue the decades-long partnership is strong, as demonstrated by ongoing efforts to extend the partnership beyond 2023. Language in Public Law 116–9 requires program stakeholders to work with the Secretary of the Interior to develop a list of actions necessary to assist in the recovery of the endangered fishes in the upper basin, and to estimate the costs of those actions. The partners are actively working to provide this information and to simultaneously define a program structure and funding strategy that would implement the actions after 2023. Partners recognize that declining hydropower production requires the negotiation of new funding strategies (Western Area Power Administration (WAPA) 2020, pp. 8–12, 16) and that funding must be adequate to implement the management actions necessary for humpback chub recovery in the upper basin. Until the Upper Basin Recovery Program partnership is defined and adequately funded, the humpback chub's future resource conditions are not certain because critical management actions, such as leasing water for river flows, in-river nonnative fish removal, fish passage operations, and monitoring may not be implemented.

In the lower basin, the Long-Term Experimental and Management Plan and other legally binding mechanisms provide more certainty for humpback chub conservation actions, including additional adaptive actions likely needed to respond to changing resource conditions (Service 2018b, pp. 12–14). Unlike the Upper Basin Recovery Program, the Glen Canyon Dam AMP and associated funding does not have a scheduled expiration. However, declining hydropower production also impacts the funding strategies for this partnership (WAPA 2020, pp. 8–12, 16). Continued implementation of management actions is critical to the humpback chub's future resource conditions in the lower basin.

Summary of Comments and Recommendations

In the proposed rule published in the **Federal Register** on January 22, 2020 (85 FR 3586), we requested that all interested parties submit written comments on our proposal to downlist

the humpback chub by March 23, 2020. We also contacted appropriate Federal and State agencies, Native American Tribes, scientific experts and organizations, and other interested parties and invited them to comment on the proposal. Newspaper notices inviting general public comment were published in the Arizona Daily Sun (Arizona), the Salt Lake Tribune (Utah), and the Grand Junction Sentinel (Colorado). We did not receive any requests for a public hearing. All comments are posted at <http://www.regulations.gov> under Docket No. FWS–R6–ES–2018–0081. All substantive information received during the comment period is either incorporated directly into this final rule or is addressed below.

State Comments

Section 4(b)(5)(A)(ii) of the Act states that the Secretary must give actual notice of a proposed regulation under section 4(a) to the State agency in each State in which the species is believed to occur, and invite the comments of such agency. Section 4(i) of the Act directs that the Secretary will submit to the State agency a written justification for his or her failure to adopt regulations consistent with the agency's comments or petition. We solicited and received comments from the States of Arizona (Arizona Game and Fish Department), Colorado (Colorado Department of Natural Resources), and Utah (Utah Public Lands Policy Coordinating Office). The three States support our reclassification of humpback chub with a section 4(d) rule.

Tribal Comments

We received one letter from a Native American Tribe, the Navajo Nation, in which the Little Colorado River portion of the Grand Canyon population resides. On July 2, 2020, we conducted government-to-government consultation concerning the proposed rule to reclassify humpback chub with a section 4(d) rule. The Navajo Nation supports our reclassification of humpback chub with a section 4(d) rule.

Public Comments

We received 78 letters from the public that provided comments on our January 22, 2020, proposed rule (85 FR 3586). We received letters from the general public, nongovernmental organizations such as water users, power customers, and environmental organizations. All of the comments included their views on whether the humpback chub should be reclassified, with letters of support for and opposition to the downlisting. We considered identical comments

submitted by different entities to be one substantive comment, such as identical letters and emails submitted by multiple water user groups and the Sierra Club. Relevant public comments are addressed in the following summary, and new information was incorporated in this final rule.

Comment (1): Some comments stated that the humpback chub should not be reclassified because population demographics do not meet the current recovery goals. Specifically, those comments stated that upper basin population abundances were too small to warrant reclassification and the current recovery goals include the Dinosaur National Monument population, which has experienced extirpation in the last two decades. Additional comments requested that we use the most recent population monitoring data to characterize the current condition of the species. Specifically, those comments requested that we incorporate updated monitoring information for the Little Colorado River, western Grand Canyon, and all upper basin populations.

Our Response: We used the most recent monitoring data to characterize the status of the species and updated population status descriptions throughout the rule. The current distribution of the humpback chub in five extant populations across the upper and lower basins, with new locations emerging in the lower basin, provides adequate redundancy for the species. Populations are either stable (Grand Canyon, Desolation and Gray Canyons, Cataract Canyon, and Black Rocks), or are increasing (Westwater Canyon and western Grand Canyon), demonstrating their resiliency regardless of abundance. As summarized above, the current condition of the species includes adequate resiliency, redundancy, and representation to support species viability.

We recognize that the extirpation of the Dinosaur National Monument population negatively affected the species and reestablishing that population would have conservation value to the species. Because existing habitats could potentially support a population, the Upper Basin Recovery Program has convened a team to consider translocation or stocking to restore humpback chub to Dinosaur National Monument. We support this conservation effort.

As described under Recovery above, recovery plans provide important guidance to the Service, States, Tribes, and other partners on methods of enhancing conservation and minimizing threats to listed species, as well as

measurable criteria against which to measure progress towards recovery, but they are not regulatory documents and cannot substitute for the determinations and promulgation of regulations required under section 4(a)(1) of the Act. We expect to revise the recovery plan for the humpback chub when this rulemaking is complete.

Our decision to revise the status of the humpback chub is based on an analysis of the best scientific and commercial data available, regardless of whether that information differs from the recovery plan. As described in *Determination of Status* below, our review of the best available scientific and commercial information indicates that the humpback chub meets the definition of a threatened species.

Comment (2): Some comments stated that we should not reclassify the species to threatened because the species will receive less protection under the Act. Furthermore, some comments specifically mentioned that if this rulemaking were finalized, there would be no regulatory mechanisms in place to protect the species from large-scale projects, including hydropower projects proposed for the Little Colorado River currently under Federal Energy Regulatory Commission (FERC) review.

Our Response: Reclassification from endangered to threatened would not remove the species from the Federal List of Endangered and Threatened Wildlife. Therefore, this rule would not eliminate protections afforded by the Act, including prohibitions of take under section 9 of the Act, except as defined under this rule's special 4(d) provisions. Likewise, reclassification would not change in any way the recovery planning provisions of section 4(f) of the Act, the consultation requirements under section 7 of the Act, or the ability of the Service to enter into partnerships for the management and protection of the humpback chub.

As part of this rulemaking, we developed a species-specific 4(d) rule, the provisions of which would promote the conservation of the humpback chub by providing continued protection from take and would facilitate the expansion of the species' range by increasing flexibility in management activities. These activities are intended to support the conservation of humpback chub. All other actions that could impact the species would still be governed by the Act's prohibitions of take under section 9 of the Act.

The Act's section 9 take prohibitions, along with the consultation requirements under section 7 of the Act, would provide adequate regulatory oversight for projects likely to

jeopardize the continued existence or recovery of humpback chub. This includes the proposed hydropower projects in the Little Colorado River under FERC consideration. The Department of the Interior has submitted comments on these projects specific to potential impacts to humpback chub. As stated in both of FERC's May 21, 2020, Preliminary Permits, if a license is pursued, FERC "will comply with the requirements of the [Act] during its review of the application" (FERC 2020a, p. 5; FERC 2020b, p. 5).

Comment (3): Some comments stated that the provisions of the 4(d) rule for humpback chub would not protect humpback chub, specifically the catch and release angling provisions. Conversely, all three States provided comments supporting the 4(d) rule provisions, with the State of Colorado specifically stating that all provisions are relevant to the recovery of the humpback chub.

Our Response: We determined that the specific provisions in the 4(d) rule adequately protect humpback chub while facilitating the conservation and management of humpback chub where they currently occur, and may occur in the future. We included descriptions of reasonable care to limit the take to humpback chub during these important conservation activities. Of particular note, we provide take prohibitions for catch-and-release angling of humpback chub only in areas outside of the core populations, thus protecting humpback chub from intentional angling pressure in these important areas.

Comment (4): One comment stated that the proposed rule fails to adequately address whether the chub's most at-risk populations in the upper basin are still "in danger of extinction" and, if so, whether any of these higher risk populations constitute a "significant portion" of the chub's range thereby requiring the species as a whole to remain federally listed as endangered.

Our Response: Based on the ruling of the court in *Center for Biological Diversity v. Everson*, 2020 WL 437289 (D.D.C. Jan. 28, 2020), we have revised our evaluation of the status of the humpback chub throughout a significant portion of its range to meet the court's requirements under *Status Throughout a Significant Portion of Its Range*, below.

Comment (5): Some comments indicated that we failed to fully analyze and include the current and future effects of climate change in the Colorado River basin that cause river flow declines, such as air temperature increases, increased evapotranspiration,

and precipitation declines. Some commenters provided scientific research on the severe and persistent drought in the Colorado River since 2000, including how existing climatic warming has exacerbated declines in precipitation.

Our Response: We recognize that adequate flow regimes are key to the conservation of humpback chub and that climate change may impact flow regimes in the Colorado River basin. We analyzed the current and expected future condition of flow regimes to support humpback chub in the SSA, including the ongoing and expected impact of climate change on this resource. Because we recognize climate change impacts will likely reduce water supply through a variety of mechanisms, such as less precipitation, warmer air temperatures, drier soils, and increased evapotranspiration, all future scenarios analyzed in the SSA, and used in this rule, assume that the mean annual availability of water (snowpack and runoff) will be lower in the future (Service 2018b, p. 134). However, atmospheric conditions and water supply are not the only factor in realized flows in humpback chub habitats, because all humpback chub habitats are downstream of large federally operated reservoirs. Federal legislation and interstate compacts ensure that water is released downstream through humpback chub habitats, and reservoir operators have flexibility in operations. This flexibility is exercised in the upper basin by providing intra-annual variation in flows (spring peaks and base flows) tailored to the hydrological conditions. This can be demonstrated because, despite a severe reduction in water availability since 2000, water managers have provided intra- and inter-annual variability of flow regimes that support humpback chub.

We recognize that this flexibility of water storage projects may be outpaced by declines in long-term water supply. Considering this important relationship between long-term water supply and reservoir operations, future resource conditions varied according to the likely implementation and effectiveness of reservoir operations compared with declining water supply (Service 2018b, p. 134). For example, Scenario 2 in the SSA considered a future where “water operations cannot provide adequate flows or temperatures in humpback chub habitats because drought or other factors have decreased [long-term] water supply” (Service 2018b, p. 135).

In this final rule, we have included new scientific research concerning climate change and water supply in the

Colorado River basin that has been published since the completion of the SSA report (Service 2018b, entire) and the publication of the proposed rule (January 22, 2020; 85 FR 3586). We incorporated this new research into our final rule in Summary of Biological Status and Threats, including references provided by commenters. Despite the severe drought during the past 15 to 20 years, management of river flows has restored much of the important intra- and inter-annual variability of river flow that the humpback chub needs to breed, feed, and shelter. Although regional climatic patterns are expected to reduce water availability in the future, the flexible operation of large dams may mitigate the impacts of this decrease on humpback chub through flow management and shepherding of water to downstream users. Although operations have been able to provide humpback chub with adequate flows despite the recent severe drought, future climatic conditions could outstrip management flexibility or increase frequency of drier hydrologies, which benefit nonnative species.

Current river flow conditions and temperatures are largely adequate for humpback chub in both basins despite ongoing climatic warming. Therefore, we find that climate change does not place humpback chub at immediate risk of extinction (*i.e.*, the species is not endangered as a result of climate change). The uncertainty concerning the possible severity in water supply declines does pose a threat to humpback chub in the future, such that we conclude that humpback chub is likely to become endangered within the foreseeable future. Therefore, our review of the best available scientific and commercial information, including recent information concerning climate change, indicates that the humpback chub meets the definition of a threatened species rather than an endangered species.

Comment (6): Some comments stated the humpback chub is at risk from non-climate change related modifications to river flows, such as modified temperature regimes below large dams, human water use, declines in spring peak flows, and reduced flows in the Little Colorado River from aquifer diversions. Some comments requested we include additional descriptions of reservoir operation management actions that benefit humpback chub, including water provided to support peak- and base-flows.

Our Response: Modified flow regimes resulting from reservoir operations and human water use could possibly impact humpback chub. We considered these

potential impacts when we completed the SSA report for the humpback chub and in our analysis in the proposed rule. We included additional research and management actions into this rule in Summary of Biological Status and Threats, above, including references provided by commenters.

We considered habitat alterations from dam operations and human water use, including altered river thermal regimes, spring peak flows, and human water withdrawals in the SSA report (Service 2018b, pp. 35, 59, 87, 126). Current river flow conditions and temperatures are largely adequate for humpback chub. Therefore, we find that modified flow regimes from reservoir operations and human water use do not place humpback chub at immediate risk of extinction. Possible water supply declines in the future could pose a threat to humpback chub resource conditions, such that we conclude that humpback chub is likely to become endangered within the foreseeable future. The findings of our analysis is consistent with our determination that the humpback chub meets the definition of a threatened species rather than an endangered species.

Comment (7): Some commenters stated that we should consider impacts from nonnative fish, especially nonnative trout in the Grand Canyon, and smallmouth bass, northern pike, and walleye in the upper basin. Some comments stated that the threat from nonnative fish should preclude its reclassification as threatened. Conversely, water user organizations and all three State wildlife agencies requested that we include additional information concerning nonnative fish management actions into the proposed rule and use that information to justify that the species does warrant reclassification.

Our Response: Nonnative fish impact humpback chub, especially when nonnative fish prey upon humpback chub when their habitats overlap. In the SSA, we considered the presence and impacts of nonnative predators, such as trout in the lower basin (Service 2018b, pp. 71, 91, 128), smallmouth bass, northern pike, and walleye in the upper basin (Service 2018b, pp. 42, 87, 128), and conservation actions designed to mitigate these threats (Service 2018b, pp. 87, 91, 97). We included additional research and management actions into this rule in Summary of Biological Status and Threats, above, including references provided by commenters.

Current conditions of nonnative fish are acceptable to humpback chub because problematic, nonnative predators reproduce in only one extant

population, Desolation and Gray Canyons. Other populations do have nonnative predators nearby, but these predators have not colonized humpback chub habitats. Nonnative fish conditions are expected to remain acceptable in the upper basin because of the commitment to multifaceted nonnative fish management and existence of adequate flow regimes, but the risk for substantial and rapid degradation is present if management actions are ceased. In the lower basin, current densities of nonnative predators are low in areas inhabited by humpback chub, such as the Little Colorado River and western Grand Canyon, and management actions are in place to prevent establishment of new species. The findings of our analysis of the threat of nonnative fish to humpback chub is consistent with our determination that the humpback chub meets the definition of a threatened species rather than an endangered species.

Comment (8): Some comments stated that we did not adequately consider possible impacts of water contamination on humpback chub, including impacts from oil, gas, and uranium extraction and possible contaminant spills.

Our Response: In the SSA report, we stated that humpback chub needs suitable water quality with few contaminants and little risk of spills (Service 2018b, p. 28). We analyzed the current and expected future condition of water quality and found that it is not limiting any populations of humpback chub or predicted to in the foreseeable future (Service 2018b, pp. 50, 73); therefore, water quality was not considered a threat to the viability of the species.

Comment (9): One comment stated that we did not adequately consider possible impacts of the parasitic Asian tapeworm on humpback chub.

Our Response: In the SSA report, we recognized the presence of aquatic parasites in humpback chub habitats, including Asian tapeworm, but determined that no parasites or parasitic outbreak has impacted any humpback population (Service 2018b, p. 23). We analyzed the current and future expected condition of parasites and found that they are not limiting any populations of humpback chub or predicted to in the foreseeable future (Service 2018b, p. 128); therefore, this was not considered a threat to the viability of the species.

Comment (10): Some comments stated that altered habitat was limiting the viability of humpback chub.

Our Response: In the SSA report, we recognized that humpback chub needs diverse rocky canyon habitat (Service

2018b, p. 28). We analyzed the current and future expected condition of this resource for humpback chub and found that humpback chub's rocky canyon habitat is largely unchanged and located in lands administered by Federal, State, and Tribal agencies that protect the current and future condition (Service 2018b, pp. 34, 58, 83, 86). Therefore, habitat alteration was not considered a threat to the viability of the species.

Comment (11): Some comments stated that the populations of humpback chub are fragmented, especially by Glen Canyon Dam, and that lack of connectivity reduces the genetic fitness of the species.

Our Response: In the SSA report, we recognized that the humpback chub requires connectivity (Service 2018b, p. 29). We analyzed the current and future expected condition of connectivity for humpback chub and found that at a species level, Glen Canyon Dam is a barrier to movement between the upper and lower basins. Within the upper basin, there is no impediment to movement among the four extant populations because multiple fish passage projects have been built and operated over the past two decades. Movement of individuals in the upper basin are sufficient to ensure genetic exchange and diversity, but not sufficient to repopulate other areas (Service 2018b, p. 52). In the lower basin, connectivity between the Little Colorado River population and other aggregations downstream is sufficient for genetic exchange, but the demographic effect is unclear (Service 2018b, p. 75). There are no barriers between the Little Colorado River and the newly expanded population in the western Grand Canyon.

Because humpback chub in the upper and lower basin can freely swim between habitats in each basin, population connectivity was not considered a threat to the viability of the species. In the 2002 Recovery Goals we determined that recovery of the species can be achieved via two unconnected recovery units, the lower basin and upper basin, demarcated at Glen Canyon Dam. The findings of our analysis of connectivity within the range of humpback chub is consistent with our determination that the humpback chub meets the definition of a threatened species rather than an endangered species.

Comment (12): Some comments stated that we did not appropriately consider the impact of food supply in the Grand Canyon and requested that we incorporate additional information from recent studies of macroinvertebrate flows in the Grand Canyon.

Our Response: In the SSA report, we recognized that humpback chub need an adequate and reliable food supply (Service 2018b, p. 28). We analyzed the current and future expected condition of this resource for humpback chub and found the aquatic food base in Grand Canyon is affected by temperature, daily flow variation, and fish competition, which may limit the size of the humpback chub population (Service 2018b, p. 68); therefore, we considered this impact to the viability of the species in the proposed rule.

Discharge variation from hydropeaking operations in the Grand Canyon limits the success of aquatic egg-laying insect species whose eggs are desiccated during the incubation cycle. It is unclear if ongoing macroinvertebrate production flow experiments have increased long-term macroinvertebrate density (Kennedy and Meuhlbauer 2020, pp. 12–20) or if they will appreciably improve humpback chub condition. We incorporated this research and management action into this rule in Summary of Biological Status and Threats, including references provided by commenters. The findings of our analysis of food supply within the range of humpback chub is consistent with our determination that the humpback chub meets the definition of a threatened species rather than an endangered species.

Comment (13): Some comments requested that we update our description of the future of the Upper Basin Recovery Program to include the most recent planning of program partners. The comments stated that the uncertainty regarding the future of the Upper Basin Recovery Program, as described in Scenario 1, was not justified because program partners have a strong commitment to future implementation of the program.

Our Response: We have included new information from the planning process to reauthorize the Upper Basin Recovery Program in our Summary of Biological Status and Threats, above. We understand that the partners are working diligently to find a framework for the Upper Basin Recovery Program to continue after 2023. The past performance of the Upper Basin Recovery Program's implementation of recovery actions over the past three decades cannot be discounted. However, at this time, there are no signed extensions or reauthorizations of the program on which we can rely for this rule. Until the Upper Basin Recovery Program partnership is defined, the humpback chub's future resource conditions are not certain

because critical management actions, such as leasing water for river flows, in-river nonnative fish removal, fish passage operations, and monitoring may not be implemented.

We must rely on the best available information when making our determination and at this time we must recognize that there is uncertainty in the future structure and funding for the Upper Basin Recovery Program. Therefore, we did not alter the analysis of Scenario 1 presented in the SSA report.

Determination of Humpback Chub Status

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for determining whether a species meets the definition of an endangered species or a threatened species. The Act defines an “endangered species” as a species that is “in danger of extinction throughout all or a significant portion of its range,” and a “threatened species” as a species that is “likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” For a more detailed discussion on the factors considered when determining whether a species meets the definition of an endangered species or a threatened species and our analysis on how we determine the foreseeable future in making these decisions, please see Regulatory and Analytical Framework.

Status Throughout All of Its Range

As required by the Act, we considered the five factors in assessing whether humpback chub is an endangered or threatened species throughout all of its range. We carefully examined the best scientific and commercial information available regarding the past, present, and future threats faced by humpback chub. We reviewed the information available in our files and other available published and unpublished information and information that we received from public comments on our January 22, 2020, proposed rule (85 FR 3586), and we consulted with recognized experts and State agencies. We documented our analysis in an SSA report (Service 2018b, entire).

We identified changes to water flow and temperature (Factor A), food availability (Factor A), and predatory, nonnative fish (Factor C) as potential stressors to humpback chub (Service 2018b, pp. 126–133). There is no evidence that overutilization (Factor B) of humpback chub, disease (Factor C), or other natural and manmade factors affecting the species (Factor E) are

occurring. We evaluated each potential stressor, including its source, affected resources, exposure, immediacy, geographic scope, magnitude, and impacts on individuals and populations, and our level of certainty regarding this information, to determine which stressors were likely to be drivers of the species’ current and future conditions (Service 2018b, pp. 126–133). We also evaluated the effects of stressors that may operate cumulatively, such as low river flows and warm water temperatures that may act cumulatively to increase predation by nonnative predators.

As described in the determinations below, we first evaluate whether the humpback chub is in danger of extinction throughout its range now. We then evaluate whether the species is likely to become in danger of extinction throughout its range in the foreseeable future. We finally consider whether the humpback chub is an endangered or threatened species in a significant portion of its range.

In this finding, we evaluate the best available scientific information about the species’ current and projected future levels of demographic and habitat factors (these are described in the SSA report in terms of resiliency, redundancy, and representation) to describe the viability of the species, and how it may change over time (using three plausible future scenarios). Ultimately, we compare our evaluation of the species risk of extinction against the definition of an endangered species.

As summarized above, resource conditions for the humpback chub across five extant populations, four in the upper basin and one large population in the lower basin, are adequate. Habitats support multiple, resilient populations in the upper basin, including the large Westwater Canyon population, and the large, stable Grand Canyon population in the lower basin, with range expansion into western Grand Canyon. The species currently demonstrates sufficient levels of resiliency, redundancy, and representation across both the upper basin and lower basin populations, such that the potential extirpation of multiple populations is not likely to occur now or in the short term. The current resiliency of the large core population in the lower basin and the current resiliency and redundancy of the four populations in the upper basin decrease the risk to the species from stochastic and catastrophic events, such that the species currently has a low risk of extinction.

Thus, after assessing the best available information, we conclude that the

humpback chub no longer meets the Act’s definition of an endangered species. We therefore proceed with determining whether the humpback chub is likely to become endangered within the foreseeable future throughout all of its range.

The key statutory difference between a threatened species and an endangered species is the timing of when a species may be in danger of extinction, either now (endangered species) or in the foreseeable future (threatened species).

In considering the foreseeable future, we projected a range of plausible future scenarios for the humpback chub and evaluated the condition of demographic factors and habitat factors under each future scenario. We then summarized the future viability for the species in terms of its resiliency, redundancy, and representation under each of the three future scenarios. For the purposes of this finding, we generally define viability as the ability of the species to sustain a population in the wild over a biologically meaningful timeframe, in this case, 16 to 40 years into the future, a biologically meaningful timeframe that represents multiple generations of humpback chub. The timeframe should be sufficient to be able to observe changes in the condition of the species through multiple generations, multiple cycles of changes to climate conditions, such as drought, and is a timeframe in which we can reasonably rely on projections about the future.

To assist us in evaluating the status of the species in the foreseeable future, we evaluated the future condition of the humpback chub under three plausible future scenarios, 16 and 40 years into the future. These scenarios were designed to capture the full range of plausible futures and uncertainty associated with the implementation and effectiveness of conservation actions important to the humpback chub’s survival. Although the likelihood of each scenario occurring in the future may vary, the changes in conservation efforts projected by the three scenarios are all plausible, so the scenarios capture the full range of conditions that the humpback chub could experience 16 and 40 years into the future. We evaluated the viability of the humpback chub under each of these scenarios in terms of its expected resiliency, redundancy, and representation into the foreseeable future.

Looking into the foreseeable future, habitat and demographic conditions for the humpback chub would severely degrade within both 16 and 40 years under Scenario 1, primarily in the upper basin. However, if collaborative partnerships remain in place and their

conservation actions are effective as described under Scenario 3, resource conditions improve at both the 16- and 40-year timeframes. However, under Scenario 2, degradation of resources takes place, even as conservation actions continue, resulting in the same conditions as current condition within 16 years, but reduced conditions within 40 years. Although there is high uncertainty associated with the projection of the resource conditions in 40 years under Scenario 2, extrapolation of the conditions demonstrates a continuing decline in resource conditions under Scenario 2. The potential extirpation of multiple populations could most likely occur in the upper basin under the short 16-year timeframe in Scenario 1 and the longer 40-year timeframe under Scenario 2. Under Scenario 3, ongoing threat management proves successful in the long term, improving resource conditions. Under Scenario 3, the health (resiliency) and distribution (redundancy) of all five extant populations reduces the risk from a potential catastrophic event, but there is less resiliency and redundancy under Scenarios 1 and 2, which represents more risk to the species.

Based on the uncertain trajectory of several of the upper basin populations; the uncertainty associated with certain resource conditions, including nonnative predatory fish, river flow, and food supply in the Grand Canyon; and the unresolved future of the Upper Basin Recovery Program, the future conditions for the populations and overall species viability are at increased risk and could decline within 40 years under Scenarios 1 and 2. Future conditions would only improve under Scenario 3 if long-term management actions are successful.

Therefore, there is enough risk in the foreseeable future associated with potential reductions in conservation actions that are important to the species' survival, such that the humpback chub is likely to become endangered throughout all of its range within the foreseeable future. Specifically, there is enough risk associated with the potential reduction of important management actions, which could occur with reduced funding in the Upper Basin Recovery Program, such that the humpback chub is at risk of extinction in the foreseeable future.

Thus, after assessing the best available information, we determine that the humpback chub is not currently in danger of extinction, but is likely to become in danger of extinction within the foreseeable future throughout all of its range.

Status Throughout a Significant Portion of Its Range

Under the Act and our implementing regulations, a species may warrant listing if it is in danger of extinction or likely to become so in the foreseeable future throughout all or a significant portion of its range. The court in *Center for Biological Diversity v. Everson*, 2020 WL 437289 (D.D.C. Jan. 28, 2020) (*Center for Biological Diversity*), vacated the aspect of the Final Policy on Interpretation of the Phrase "Significant Portion of Its Range" in the Endangered Species Act's Definitions of "Endangered Species" and "Threatened Species" (79 FR 37578; July 1, 2014) that provided that the Services do not undertake an analysis of significant portions of a species' range if the species warrants listing as threatened throughout all of its range. Therefore, we proceed to evaluating whether the species is endangered in a significant portion of its range—that is, whether there is any portion of the species' range for which both (1) the portion is significant; and (2) the species is in danger of extinction in that portion. Depending on the case, it might be more efficient for us to address the "significance" question or the "status" question first. We can choose to address either question first. Regardless of which question we address first, if we reach a negative answer with respect to the first question that we address, we do not need to evaluate the other question for that portion of the species' range.

Following the court's holding in *Center for Biological Diversity*, we now consider whether there are any significant portions of the species' range where the species is in danger of extinction now (*i.e.*, endangered). In undertaking this analysis for the humpback chub, we choose to address the status question first—we consider information pertaining to the geographic distribution of both the species and the threats that the species faces to identify any portions of the range where the species is endangered.

For the humpback chub, we considered whether the threats are geographically concentrated in any portion of the species' range at a biologically meaningful scale. We examined the following threats: River flows and water temperature (which could be affected by climate change in the long term) (Factor A), food supply (Factor A), and predatory nonnative fish (Factor C), including cumulative effects. There is no evidence that overutilization (Factor B) of humpback chub, disease (Factor C), or other natural and

manmade factors affecting the species (Factor E) are occurring.

Current river flow conditions and temperatures are largely adequate for humpback chub throughout its range, in both the upper and lower basins, because reservoir operations have had the flexibility and commitment to support humpback chub. Despite the severe drought experienced during the past 15 to 20 years across the species' range, management of river flows has restored much of the important intra- and inter-annual variability of river flow that the humpback chub needs to breed, feed, and shelter. Specifically, in the upper basin, changes in the operation of large Federal dams and provision of water dedicated to environmental flows have reduced the effects of drought on river flows. Therefore, despite a severe reduction in water availability since 2000, water managers have provided flow regimes in upper basin rivers that support humpback chub, and upper basin populations have stabilized or expanded in response. As a result, we did not identify a concentration of threats associated with either river flows or water temperature.

In the lower basin, the Long-Term Experimental and Management Plan prescribes release patterns from Glen Canyon Dam, helping to reduce and minimize impacts to Grand Canyon habitats. This includes experimental releases to support the aquatic food base in Grand Canyon. Currently, the water flows, water temperatures, and food base in the Grand Canyon have supported a large, stable population in the Colorado River and are supporting a range expansion in the western Grand Canyon. As such, we did not identify a concentration of threats in the lower basin.

Current river flow conditions have supported humpback chub populations in both the upper and lower basins and have helped reduce the presence of nonnative predatory fish species in humpback chub habitats, despite populations of predators nearby. Additionally, nonnative fish management actions have helped reduce nonnative predatory species, such as in-river nonnative predator removal, active flow management, and reservoir containment. As a result, nonnative predators are not limiting three out-of-the four extant humpback chub populations in the upper basin, and are a moderate issue for one population in the upper basin. Smallmouth bass inhabit and reproduce in Dinosaur National Monument, so nonnative predators could potentially be an issue if Dinosaur National Monument supported a humpback chub population

and was not extirpated, but we did not identify a concentration of nonnative predators in this area. In the lower basin, nonnative fish are likely limited by abiotic factors, so nonnative predators are not an issue across the majority of humpback chub habitats in the lower basin, including the Little Colorado River and western Grand Canyon (Pillow *et al.* 2018, p. 7; Van Haverbeke *et al.* 2019, p. 8; Kegerries *et al.* 2020, p. 146). Management actions are also in place to prevent establishment of new nonnative species in the lower basin, including the NPS “Expanded Nonnative Species Management Plan,” which provides additional tools and new approaches for controlling nonnative aquatic species (NPS 2018, pp. 1–3). Therefore, we did not identify any concentration of threats associated with nonnative predators across the range of the species.

We found no concentration of threats in any portion of the humpback chub range at a biologically meaningful scale. Thus, there are no portions of the species’ range where the species has a different status from its rangewide status. Therefore, no portion of the species’ range provides a basis for determining that the species is in danger of extinction in a significant portion of its range, and we determine that the species is likely to become in danger of extinction within the foreseeable future throughout all of its range. This is consistent with the courts’ holdings in *Desert Survivors v. Department of the Interior*, No. 16-cv-01165–JCS, 2018 WL 4053447 (N.D. Cal. Aug. 24, 2018), and *Center for Biological Diversity v. Jewell*, 248 F. Supp. 3d, 946, 959 (D. Ariz. 2017).

Determination of Status

Our review of the best available scientific and commercial information indicates that humpback chub does not meet the definition of an endangered species in accordance with sections 3(6) and 4(a)(1) of the Act, but does meet the definition of a threatened species in accordance with sections 3(20) and 4(a)(1) of the Act. Therefore, we are downlisting humpback chub in the List of Endangered and Threatened Wildlife from endangered to threatened.

Final Rule Issued Under Section 4(d) of the Act

It is our policy, as published in the *Federal Register* on July 1, 1994 (59 FR 34272), to identify to the maximum extent practicable at the time a species is classified, those activities that would or would not constitute a violation of section 9 of the Act. The intent of this policy is to increase public awareness of

the effect of a listing on proposed and ongoing activities within the range of the species being listed. Because we are reclassifying this species as a threatened species, the prohibitions in section 9 would not apply directly. We are therefore putting into place below a set of regulations to provide for the conservation of the species in accordance with section 4(d), which also authorizes us to apply any of the prohibitions in section 9 to a threatened species. The 4(d) rule, which includes a description of the kinds of activities that would or would not constitute a violation, complies with this policy.

Background

Section 4(d) of the Act contains two sentences. The first sentence states that the “Secretary shall issue such regulations as he deems necessary and advisable to provide for the conservation” of species listed as threatened. The U.S. Supreme Court has noted that statutory language like “necessary and advisable” demonstrates a large degree of deference to the agency (see *Webster v. Doe*, 486 U.S. 592 (1988)). Conservation is defined in the Act to mean “the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to [the Act] are no longer necessary.” Additionally, the second sentence of section 4(d) of the Act states that the Secretary “may by regulation prohibit with respect to any threatened species any act prohibited under section 9(a)(1), in the case of fish or wildlife, or section 9(a)(2), in the case of plants.” Thus, the combination of the two sentences of section 4(d) provides the Secretary with wide latitude of discretion to select and promulgate appropriate regulations tailored to the specific conservation needs of the threatened species. The second sentence grants particularly broad discretion to us when adopting the prohibitions under section 9.

The courts have recognized the extent of the Secretary’s discretion under this standard to develop rules that are appropriate for the conservation of a species. For example, courts have upheld rules developed under section 4(d) as a valid exercise of agency authority where they prohibited take of threatened wildlife, or include a limited taking prohibition (see *Alsea Valley Alliance v. Lautenbacher*, 2007 U.S. Dist. Lexis 60203 (D. Or. 2007); *Washington Environmental Council v. National Marine Fisheries Service*, 2002 U.S. Dist. Lexis 5432 (W.D. Wash. 2002)). Courts have also upheld 4(d) rules that do not address all of the

threats a species faces (see *State of Louisiana v. Verity*, 853 F.2d 322 (5th Cir. 1988)). As noted in the legislative history when the Act was initially enacted, “once an animal is on the threatened list, the Secretary has an almost infinite number of options available to him with regard to the permitted activities for those species. He may, for example, permit taking, but not importation of such species, or he may choose to forbid both taking and importation but allow the transportation of such species” (H.R. Rep. No. 412, 93rd Cong., 1st Sess. 1973).

Exercising this authority under section 4(d), we have developed a species-specific 4(d) rule that is designed to address the humpback chub’s specific threats and conservation needs. Although the statute does not require us to make a “necessary and advisable” finding with respect to the adoption of specific prohibitions under section 9, we find that this rule as a whole satisfies the requirement in section 4(d) of the Act to issue regulations deemed necessary and advisable to provide for the conservation of the humpback chub. As discussed above under the Determination of Humpback Chub’s Status section, we conclude that the humpback chub is no longer at risk of extinction, but is still likely to become so in the foreseeable future, primarily due to changes to water flow and temperature, food availability, and predatory, nonnative fish. The provisions of this 4(d) rule promote conservation of the humpback chub by providing continued protection from take, encouraging improvements to the species’ habitat, and facilitating the expansion of the species’ range by increasing flexibility in management activities. The provisions in this rule are some of many regulatory tools that we will use to promote the conservation of the humpback chub.

Provisions of the 4(d) Rule

This 4(d) rule provides for the conservation of the humpback chub by prohibiting the following activities, with certain exceptions (discussed below): Importing or exporting; possession and other acts with unlawfully taken specimens; delivering, receiving, transporting, or shipping in interstate or foreign commerce in the course of commercial activity; or selling or offering for sale in interstate or foreign commerce. In addition, anyone taking, attempting to take, or otherwise possessing a humpback chub, or parts thereof, in violation of section 9 of the Act will be subject to a penalty under section 11 of the Act, with certain

exceptions (discussed below). Under section 7 of the Act, Federal agencies must continue to ensure that any actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of the humpback chub.

Under the Act, "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Some of these provisions have been further defined in regulations at 50 CFR 17.3. Take can result knowingly or otherwise, by direct and indirect impacts, intentionally or incidentally. Allowing incidental and intentional take in certain cases, such as for the purposes of scientific inquiry, monitoring, or to improve habitat or water availability and quality, would help preserve a species' remaining populations, slow their rate of decline, and decrease synergistic, negative effects from other stressors.

We recognize the special and unique relationship with our State natural resource agency partners in contributing to conservation of listed species. State agencies often possess scientific data and valuable expertise on the status and distribution of endangered, threatened, and candidate species of wildlife and plants. State agencies, because of their authorities and their close working relationships with local governments and landowners, are in a unique position to assist us in implementing all aspects of the Act. In this regard, section 6 of the Act provides that we shall cooperate to the maximum extent practicable with the States in carrying out programs authorized by the Act. Therefore, any qualified employee or agent of a State conservation agency that is a party to a cooperative agreement with us in accordance with section 6(c) of the Act, who is designated by his or her agency for such purposes, will be able to conduct activities designed to conserve the humpback chub that may result in otherwise prohibited take without additional authorization.

As discussed above under Summary of Biological Status and Threats, changes to water flow and temperature, food availability, and predatory, nonnative fish affect the status of the humpback chub. A range of conservation activities, therefore, have the potential to benefit the humpback chub, including nonnative fish removal, habitat restoration projects, monitoring of humpback chub, management of recreational fisheries, research, educational and outreach programs, and maintenance of humpback chub refuges and stocking programs. Accordingly, this 4(d) rule addresses activities to facilitate conservation and management

of the humpback chub where they currently occur and may occur in the future by excepting them from the Act's take prohibition under certain specific conditions. These activities are intended to increase management flexibility and encourage support for the conservation and habitat improvement of the humpback chub. Under this 4(d) rule, take will continue to be prohibited, except for actions allowed in this 4(d) rule, provided the actions are approved by the Service, in coordination with any existing designated recovery program, for the purpose of the conservation or recovery of the humpback chub. Approval must be in writing (by letter or email) from a Service biologist or supervisor with authority over humpback chub decisions. Take is allowed under this 4(d) rule as follows, and is further described below:

- Take resulting from creating and maintaining humpback chub refuge populations;
- Take resulting from expanding the range of the species, including translocating wild fish and stocking hatchery-reared fish;
- Incidental take from reducing or eliminating nonnative fish from habitats adjacent to, or occupied by, humpback chub;
- Take resulting from catch-and-release angling activities associated with humpback chub, including incidental take from non-humpback chub-targeted angling in the six core populations and take from humpback chub-targeted angling in any newly established areas; and
- Take associated with chemical treatments in support of the recovery of humpback chub.

These forms of allowable take are explained in more detail below. For all forms of allowable take, reasonable care must be practiced to minimize the impacts from the actions. Reasonable care means limiting the impacts to humpback chub individuals and populations by complying with all applicable Federal, State, and Tribal regulations for the activity in question; using methods and techniques that result in the least harm, injury, or death, as feasible; undertaking activities at the least impactful times and locations, as feasible; procuring and implementing technical assistance from a qualified biologist on projects regarding all methods prior to the implementation of those methods; ensuring the number of individuals removed or sampled minimally impacts the existing wild population; ensuring no disease or parasites are introduced into the existing humpback chub population;

and preserving the genetic diversity of wild populations.

Creation and Maintenance of Refuge Populations

Establishing and maintaining humpback chub refuge populations is an important consideration for long-term humpback chub viability because refuge populations safeguard genetic diversity against catastrophic declines in wild populations and can be necessary to protect a population from extirpation. In the case of declining wild populations, refuge populations provide the flexibility to perform supplemental stocking into existing populations or reintroduction of individuals to extirpated areas. Refuge populations may also allow for stocking of individuals into new areas that expand the range of the species (see *Translocation or Stocking of Humpback Chub*, below). The process of establishing and supplementing refuge populations requires take in the form of collection of wild individuals of various life stages. Furthermore, the long-term care and maintenance of refuge populations will result in take, including death of individuals held in captivity. However, preservation of genetic diversity in refuge populations outweighs any losses to wild populations if performed in a deliberate, well-designed process.

Currently, some, but not all, of the genetic diversity of humpback chub exists in captive refuge populations. Approximately 1,000 individuals from the Grand Canyon population are managed as a refuge population at the Southwestern Native Aquatic Resources and Recovery Center in Dexter, New Mexico; additionally, a small number of adults from the Black Rocks and Desolation and Gray Canyons populations reside at the Ouray National Fish Hatchery. In order to preserve the full breadth of genetic diversity of humpback chub, creation of additional refuge populations could be suggested in the revised humpback chub recovery plan, by the Service, or in other proceedings, such as section 7 consultations between the Service and Federal agencies. We expect to revise the recovery plan for humpback chub when this rulemaking process is complete.

This 4(d) rule describes creation and maintenance of humpback chub refuge populations excepted from take as activities undertaken for the long-term protection of humpback chub genetic diversity. Refuge populations must include specific genetic groupings of humpback chub as defined by the best available science and must be managed

to maintain the genetic diversity of the species. Refuge populations can occur at both captive and wild locations.

The Service must approve in writing the designation of a refuge population, and any removal of individuals from wild populations. Subsequent to those approvals, under this 4(d) rule, the Service would no longer regulate the take associated with maintenance of that population. Take associated with refuge populations could include harvest of wild individuals from extant populations; incidental take during the long-term care of individuals in captivity; take related to disease, parasite, genetic assessment, and management of captive populations; and natural mortality of individuals existing in refuge populations.

Translocation and Stocking of Humpback Chub

Translocating wild humpback chub and stocking hatchery-reared humpback chub are important management actions supporting the long-term viability of the species. Introducing individuals into new areas can provide increased redundancy and decreased risk to catastrophic events by expanding the range of the species. Introducing individuals into wild populations can provide increased resiliency for extant populations by potentially offsetting population declines or increasing genetic diversity. The process of translocating wild individuals can result in take to wild individuals, including possible mortality to fish that are moved. The process of culturing and stocking individuals can also result in take via hatchery methods or incidental mortality of stocked individuals. However, if the translocation or stocking program is performed under a deliberate, well-designed program, the benefits to the species can greatly outweigh the losses.

Translocations of wild humpback chub to new locations have demonstrated success in the Grand Canyon as described above in *The Lower Basin*. Between 2003 and 2015, juvenile humpback chub were translocated from the Little Colorado River to Shinumo Creek, Havasu Creek, and the Little Colorado River above Chute Falls. At all three locations, translocated fish established residency and demonstrated acceptable growth rates, increasing the range of the species (although the Shinumo Creek population was later extirpated via ash-laden floods following a wildfire). The Havasu Creek and Chute Falls populations also demonstrated wild reproduction and recruitment, further supporting the management action of

translocations for expanding the range of the humpback chub. Based on these successes, translocation appears to be a possible tool to reintroduce individuals into the Dinosaur National Monument population or to expand the range of humpback chub into other areas.

Currently, humpback chub are not cultured in hatcheries, nor are any broodstock fish maintained at a hatchery. However, in the future, hatchery production and culture may be a necessary tool either to supplement existing populations or to introduce individuals to new locations without harvesting wild fish.

This 4(d) rule describes translocation and stocking of humpback chub excepted from take as any activity undertaken to expand the range of humpback chub or to supplement existing wild populations. Take from translocation could include harvest and movement of wild individuals from extant populations to new areas and subsequent mortality of fish in new locations. Any translocation program must be approved in writing by the Service. Take from stocking programs could include take during the long-term care of individuals in captivity; take related to disease, parasite, genetic assessment, and management of captive populations while they are in captivity; and take from stocking, including subsequent mortality of stocked individuals. Any harvest of wild fish to support a stocking program must comply with the conditions described above under *Creation and Maintenance of Refuge Populations*. Any stocking of humpback should follow best hatchery and fishery management practices, such as those described in the American Fisheries Society's *Fish Hatchery Management* (Wedemeyer 2002, entire), and be approved by the Service in writing.

Nonnative Fish Removal

Control of nonnative fishes is vital for the continued recovery of humpback chub because predatory nonnative fishes are a principal threat to humpback chub (see Summary of Biological Status and Threats, above). Removal of nonnative fishes reduces predation and competition pressure on humpback chub, increasing humpback chub survival, recruitment, and access to resources. During the course of removing nonnative fishes, take of humpback chub may occur from incidental captures resulting in capture, handling, injury, or possible mortality. However, nonnative removal activities in humpback chub habitats are designed to be selective, allowing for the removal of predatory, nonnative fish while

humpback chub are returned safely to the river. Therefore, if nonnative fish removal is performed under deliberate, well-designed programs, the benefits to humpback chub can greatly outweigh losses.

Currently, active nonnative fish removal is widespread in the upper basin, but is less common in the lower basin. Control of nonnative fishes is conducted by qualified personnel in the upper basin via mechanical removal using boat-mounted electrofishing, nets, and seines, primarily focusing on removal of smallmouth bass, northern pike, and walleye. Removal of nonnative fishes in the upper basin is performed under strict standardized protocols to limit impacts to humpback chub. In the lower basin, nonnative fish actions primarily focus on preventing establishment of new species (such as removal of green sunfish below Glen Canyon Dam) and controlling populations of trout in tributary habitats (such as removal of brown trout in Bright Angel Creek). New techniques, as available and feasible, may also need to be implemented in the future.

This 4(d) rule defines nonnative fish removal as any action with the primary or secondary purpose of mechanically removing nonnative fishes that compete with, predate, or degrade the habitat of humpback chub, and that is approved in writing by the Service for that purpose. These methods include mechanical removal within occupied humpback chub habitats, including, but not limited to, electrofishing, seining, netting, and angling, or other ecosystem modifications such as altered flow regimes or habitat modifications. All methods must be conducted by qualified personnel and used in compliance with applicable Federal, State, and Tribal regulations. Whenever possible, humpback chub that are caught alive as part of nonnative fish removal should be returned to their capture location as quickly as possible.

Catch-and-Release Angling of Humpback Chub

Recreational angling is an important consideration for management of all fisheries, as recreational angling is the primary mechanism by which the public interacts with fishes. Furthermore, angling regulations are an important communication tool. While the humpback chub is not currently a species that is prized for its recreational or commercial value, the species is a large-bodied, catchable-sized fish that could offer potential recreational value in certain situations. Conservation value from public support for humpback chub could arise through newly established

fishing locations and public engagement with this species. Furthermore, anglers target species that co-occur with humpback chub at some locations. As a result, otherwise legal angling activity in humpback chub habitats could result in the unintentional catch of humpback chub by the angling public. Catch-and-release angling, both intentional and incidental, can result in take of humpback chub through handling, injury, and potential mortality. However, the conservation support that angling provides can outweigh losses to humpback chub, if the angling program is designed appropriately.

Currently, State angling regulations require the release of all incidental catches of humpback chub and do not allow anglers to target the species. Therefore, current angling regulations for humpback chub by the States of Arizona, Colorado, and Utah demonstrate a willingness to enact appropriate regulations for the protection of the humpback chub. It is important to continue to protect humpback chub from intentional (*i.e.*, targeted) angling pressure in the six core populations (five extant and one extirpated) because of their importance to the recovery of the species. Supporting recreational fishing access to these areas for species other than humpback chub is an important consideration for State and Tribal entities. We allow incidental take of humpback chub from angling activities that are in accordance with State and Tribal fishing regulations in the six core humpback chub populations, but that do not target humpback chub. That is, incidental take associated with incidental catch-and-release of humpback chub in the core populations would not be prohibited. Reasonable consideration by the States and Tribes for incidental catch of humpback chub in the six core populations include: (1) Regulating tactics to minimize potential injury and death to humpback chub if caught; (2) communicating the potential for catching humpback chub in these areas; and (3) promoting the importance of the six core populations.

Outside of the six core populations, we foresee that Federal, State, or Tribal governments may want to establish a new location where humpback chub could be targeted for catch-and-release angling. Newly established locations could offer a genetic refuge for core populations of humpback chub (see *Creation and Maintenance of Refuge Populations*, above), provide a location for hatchery-reared fish (see *Translocation and Stocking of Humpback Chub*, above), and offer the public a chance to interact with the

species in the wild. Therefore, we allow intentional take of humpback chub from catch-and-release angling activities that target humpback chub and are in accordance with State and Tribal fishing regulations in areas outside of the six core humpback chub populations.

Sport fishing for humpback chub would only be allowed through the 4(d) rule and subsequent State or Tribal regulations created in collaboration with the Service. This rule would allow recreational catch-and-release fishing of humpback chub in specified waters, not including the six core populations. Management as a recreational species would be conducted after completion of, and consistent with the goals within, a revised recovery plan for the species. The principal effect of this 4(d) rule would be to allow take in accordance with fishing regulations enacted by States or Tribes, in collaboration with the Service.

Recreational opportunities may be developed by the States and Tribes in new waters following careful consideration of the locations and impacts to the species. Reasonable consideration for establishing new recreational locations for humpback chub include, but are not limited to: (1) Carefully evaluating each water body and determining whether the water body can sustain angling; (2) ensuring the population does not detrimentally impact core populations of humpback chub through such factors as disease or genetic drift; (3) ensuring adequate availability of humpback chub to support angling; and (4) monitoring to ensure there are no detrimental effects to the population from angling. If monitoring indicates that angling has a negative effect on the conservation of humpback chub in the opinion of the Service, the fishing regulations must be amended or the fishery could be closed by the appropriate State.

Chemical Treatments Supporting Humpback Chub

Chemical treatments of water bodies are an important fisheries management tool because they are the principal method used to remove all fishes from a defined area. That is, chemical treatments provide more certainty of complete removal than other methods, such as mechanical removal. Therefore, chemical treatments are used for a variety of restoration and conservation purposes, such as preparing areas for stocking efforts, preventing nonnative fishes from colonizing downstream areas, and resetting locations after failed management efforts. Chemical treatments of water bodies could take humpback chub if individuals reside in

the locations that are treated and cannot be salvaged completely prior to treatment. However, the overall benefit of conservation actions implemented using chemical treatment can outweigh the losses of humpback chub, if careful planning is taken prior to treatments.

Chemical piscicides (chemicals that are poisonous to fish) have been used in the upper and lower basin to remove upstream sources of nonnative fishes in support of humpback chub. For example, Red Fleet Reservoir (Green River, Utah) was treated by Utah Division of Wildlife Resources to remove walleye that were escaping downstream, and a slough downstream of Glen Canyon Dam (Colorado River, Arizona) was treated by NPS to remove green sunfish before they could invade humpback chub habitat. At Red Fleet Reservoir, chemical treatment also provided the Utah Division of Wildlife Resources with the ability to establish a new fish community that supported angling interests and provided greater compatibility with downstream conservation efforts.

Chemical treatments could support a variety of activities to assist in the conservation of humpback chub, including certain other actions described in this 4(d) rule. For example, chemical treatments could be used prior to introducing humpback chub to a wild refuge population, a translocation site, or a sport fishing location. Nonnative fishes can also be removed using chemical treatments, providing a faster and more complete removal than mechanical removal. Furthermore, chemical treatments offer the ability to fully restore a location after a failed introduction effort. For example, if humpback chub were stocked into a new area, but did not successfully establish, landowners may want to restore this location for another purpose.

Chemical treatments would be allowed under this 4(d) rule. Necessary precautions and planning should be applied to avoid impacts to humpback chub. For example, treatments upstream of occupied humpback chub habitats should adhere to all protocols to limit the potential for fish toxicants and piscicides traveling beyond treatment boundaries. Chemical treatments that take place in locations where humpback chub occur, or may occur, must take place only after a robust salvage effort takes place to remove humpback chub in the area. Whenever possible, humpback chub that are salvaged should be moved to a location that supports recovery of the species. Any chemical treatment that takes place in an area where humpback chub may

reside would need written approval from the Service, but treatments of unoccupied habitat would not need to be approved. Once the location of a chemical treatment is approved in writing by the Service, the take of humpback chub by qualified personnel associated with performing a chemical treatment would not be regulated by the Service.

Reporting and Disposal of Humpback Chub

Under the 4(d) rule, if humpback chub are killed during actions described in the 4(d) rule, the Service must be notified of the death and may request to take possession of the animal. Notification should be given to the appropriate Service Regional Law Enforcement Office or associated management office. Information on the offices to contact is set forth under Regulation Promulgation, below. Law enforcement offices must be notified within 72 hours of the death, unless special conditions warrant an extension. The Service may allow additional reasonable time for reporting if access to these offices is limited due to closure or if the activity was conducted in area without sufficient communication access.

Permits

We may issue permits to carry out otherwise prohibited activities, including those described above, involving threatened wildlife under certain circumstances. Regulations governing permits are codified at 50 CFR 17.32. With regard to threatened wildlife, a permit may be issued for the following purposes: Scientific purposes, to enhance propagation or survival, for economic hardship, for zoological exhibition, for educational purposes, for incidental taking, or for special purposes consistent with the purposes of the Act. There are also certain statutory exemptions from the prohibitions, which are found in sections 9 and 10 of the Act.

This 4(d) rule would not impact existing or future permits issued by the Service for take of humpback chub. Any person with a valid permit issued by the Service under § 17.22 or § 17.32 may

take humpback chub, subject to all take limitations and other special terms and conditions of the permit.

Nothing in this 4(d) rule changes in any way the recovery planning provisions of section 4(f) of the Act, the consultation requirements under section 7 of the Act, or our ability to enter into partnerships for the management and protection of the humpback chub. However, interagency cooperation may be further streamlined through planned programmatic consultations for the species between us and other Federal agencies, where appropriate.

Required Determinations

National Environmental Policy Act (42 U.S.C. 4321 et seq.)

We have determined that environmental assessments and environmental impact statements, as defined under the authority of the National Environmental Policy Act (NEPA; 42 U.S.C. 4321 et seq.), need not be prepared in connection with determining a species' listing status under the Endangered Species Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244). We also determine that 4(d) rules that accompany regulations adopted pursuant to section 4(a) of the Act are not subject to the National Environmental Policy Act.

Government-to-Government Relationship With Tribes

In accordance with the President's memorandum of April 29, 1994, (Government-to-Government Relations with Native American Tribal Governments; 59 FR 22951), Executive Order 13175 (Consultation and Coordination with Indian Tribal Governments), and the Department of the Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with recognized Federal Tribes on a government-to-government basis. In accordance with Secretarial Order 3206 of June 5, 1997 (American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act), we readily acknowledge our responsibilities to work directly

with Tribes in developing programs for healthy ecosystems, to acknowledge that Tribal lands are not subject to the same controls as Federal public lands, to remain sensitive to Indian culture, and to make information available to Tribes. We coordinated with Tribes in the range of the humpback chub and requested their input on this rule. On July 2, 2020, we conducted government-to-government consultation with the Navajo Nation regarding this rule.

References Cited

A complete list of references cited in this rulemaking is available on the internet at <http://www.regulations.gov> at Docket No. FWS-R6-ES-2018-0081, and upon request from the Upper Colorado River Endangered Fish Recovery Program Office (see **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this final rule are staff members of the Upper Colorado River Endangered Fish Recovery Program Office.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Regulation Promulgation

Accordingly, we amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

■ 1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 1531–1544; and 4201–4245, unless otherwise noted.

■ 2. Amend § 17.11(h) by revising the entry for “Chub, humpback” under FISHES on the List of Endangered and Threatened Wildlife to read as follows:

§ 17.11 Endangered and threatened wildlife.

* * * * *
(h) * * *

Common name	Scientific name	Where listed	Status	Listing citations and applicable rules
*	*	*	*	*

Common name	Scientific name	Where listed	Status	Listing citations and applicable rules
* Chub, humpback	* <i>Gila cypha</i>	* Wherever found	* T	* 32 FR 4001, 3/11/1967; 86 FR [INSERT Federal Register PAGE WHERE THE DOCUMENT BEGINS]; 10/18/ 2021; 50 CFR 17.44(dd); ^{4d} 50 CFR 17.95(e). ^{CH}
*	*	*	*	*

■ 3. Amend § 17.44 by adding paragraph (dd) to read as follows:

§ 17.44 Special rules—fishes.

(dd) Humpback chub (*Gila cypha*). (1) *Prohibitions.* The following prohibitions that apply to endangered wildlife also apply to humpback chub. Except as provided under paragraphs (dd)(2) and (3) of this section and §§ 17.4 and 17.5, it is unlawful for any person subject to the jurisdiction of the United States to commit, to attempt to commit, to solicit another to commit, or cause to be committed, any of the following acts in regard to this species:

- (i) Import or export, as set forth at § 17.21(b) for endangered wildlife.
- (ii) Take, unless excepted as outlined in paragraphs (dd)(2)(i) through (v) of this section.
- (iii) Possession and other acts with unlawfully taken specimens, as set forth at § 17.21(d)(1) for endangered wildlife.
- (iv) Interstate or foreign commerce in the course of commercial activity, as set forth at § 17.21(e) for endangered wildlife.
- (v) Sale or offer for sale, as set forth at § 17.21(f) for endangered wildlife.

(2) *General exceptions from prohibitions.* In regard to this species, you may:

- (i) Conduct activities as authorized by an existing permit under § 17.32.
- (ii) Conduct activities as authorized by a permit issued prior to November 17, 2021 under § 17.22 for the duration of the permit.
- (iii) Take, as set forth at § 17.21(c)(2) through (c)(4) for endangered wildlife.
- (iv) Take, as set forth at § 17.31(b).
- (v) Possess and engage in other acts with unlawfully taken specimens, as set forth at § 17.21(d)(2) for endangered wildlife.

(3) *Exceptions from prohibitions for specific types of incidental take.* You may take humpback chub while carrying out the following legally conducted activities in accordance with this paragraph (dd)(3):

(i) *Definitions.* For the purposes of this paragraph (dd)(3):

(A) *Qualified person* means a full-time fish biologist or aquatic resources

manager employed by any of the Colorado River Basin State wildlife agencies, Native American Tribes, the Department of the Interior bureaus and offices located within the Colorado River basin, or fish biologist or aquatic resource manager employed by a private consulting firm, provided the firm has received a scientific collecting permit from the appropriate State agency.

(B) *The six core populations* means the following populations of the humpback chub: Desolation and Gray Canyons (Green River, Utah), Dinosaur National Monument (Green and Yampa Rivers, Colorado and Utah), Black Rocks (Colorado River, Colorado), Westwater Canyon (Colorado River, Utah), Cataract Canyon (Colorado River, Utah), and Grand Canyon (Colorado and Little Colorado Rivers, Arizona).

(C) *Reasonable care* means limiting the impacts to humpback chub individuals and populations by complying with all applicable Federal, State, and Tribal regulations for the activity in question; using methods and techniques that result in the least harm, injury, or death, as feasible; undertaking activities at the least impactful times and locations, as feasible; and protecting existing extant wild populations of humpback chub by ensuring minimal impacts from the removal or sampling of individuals, preventing the introduction of disease or parasites, and preserving genetic diversity.

(ii) *Creation and maintenance of refuge populations.* A qualified person may take humpback chub in order to create or maintain a captive or wild refuge population that protects the long-term genetic diversity of humpback chub, provided that reasonable care is practiced to minimize the effects of that taking.

(A) Methods of allowable take under this paragraph (dd)(3)(ii) include, but are not limited to:

- (1) Removing wild individuals via electrofishing, nets, and seines from the six core populations;
- (2) Managing captive populations, including handling, rearing, and spawning of captive fish;

(3) Sacrificing individuals for hatchery management, such as parasite and disease certification; and

(4) Eliminating wild refuge populations if conditions are deemed inadequate for conservation of the species or are deemed detrimental to the six core populations.

(B) Before the establishment of any captive or wild refuge population, the Service must approve, in writing, the designation of the refuge population, and any removal of humpback chub individuals from wild populations. Subsequent to a written approval for the establishment of a refuge population, take associated with the maintenance of the refuge population would not be prohibited under the Act.

(iii) *Translocation and stocking of humpback chub.* A qualified person may take humpback chub in order to introduce individuals into areas outside of the six core populations. Humpback chub individuals may be introduced to new areas by translocating wild individuals to additional locations or by stocking individuals from captivity. All translocations of wild individuals and stocking of individuals from captivity must involve reasonable care to minimize the effects of that taking. Translocations of wild individuals and stocking of individuals from captivity must be undertaken to expand the range of humpback chub or to supplement existing populations.

(A) Methods of allowable take under this paragraph (dd)(3)(iii) include, but are not limited to:

- (1) Removing wild individuals via electrofishing, nets, and seines;
 - (2) Managing captive populations, including handling, rearing, and spawning;
 - (3) Sacrificing individuals for hatchery management, such as parasite and disease certification; and
 - (4) Removing or eliminating all humpback chub from failed introduction areas via mechanical or chemical methods.
- (B) The Service must approve, in advance and in writing:
- (1) Any translocation program; and
 - (2) Any stocking of humpback chub into any of the six core populations.

(iv) *Nonnative fish removal.* A qualified person may take humpback chub in order to perform nonnative fish removal for conservation purposes if reasonable care is practiced to minimize effects to humpback chub. For this paragraph (dd)(3)(iv), nonnative fish removal for conservation purposes means any action with the primary or secondary purpose of mechanically removing nonnative fishes that compete with, predate, or degrade the habitat of humpback chub.

(A) Methods of allowable take under this paragraph (dd)(3)(iv) include, but are not limited to:

(1) Mechanical removal of nonnative fish within occupied humpback chub habitats, including, but not limited to, electrofishing, seining, netting, and angling; and

(2) The use of other ecosystem modifications, such as altered flow regimes or habitat modifications.

(B) The Service and all applicable landowners must approve, in advance and in writing, any nonnative fish removal activities under this paragraph (dd)(3)(iv).

(v) *Catch-and-release angling of humpback chub.* States and Tribes may enact Federal, State, and Tribal fishing regulations that address catch-and-release angling.

(A) In the six core populations, angling activities may include nontargeted (incidental) catch and release of humpback chub when targeting other species in accordance with Federal, State, and Tribal fishing regulations.

(B) In areas outside of the six core populations, angling activities may include targeted catch and release of humpback chub in accordance with Federal, State, and Tribal fishing regulations.

(C) Angling activities may cause take via:

(1) Handling of humpback chub caught via angling;

(2) Injury to humpback chub caught via angling; and

(3) Unintentional death to humpback chub caught via angling.

(D) Reasonable consideration by the Federal, State, and Tribal agencies for incidental catch and release of humpback chub in the six core populations include:

(1) Regulating tactics to minimize potential injury and death to humpback chub if caught;

(2) Communicating the potential for catching humpback chub in these areas; and

(3) Promoting the importance of the six core populations.

(E) Reasonable consideration for establishing new recreational angling locations for humpback chub include, but are not limited to:

(1) Evaluating each water body's ability to support humpback chub and sustain angling;

(2) Ensuring the recreational fishing population does not detrimentally impact the six core populations of humpback chub through such factors as disease or genetic drift; and

(3) Monitoring to ensure there are no detrimental effects to the humpback chub population from angling.

(F) The Service and all applicable State, Federal, and Tribal landowners must approve, in advance and in writing, any new recreational fishery for humpback chub.

(vi) *Chemical treatments to support humpback chub.* A qualified person may take humpback chub by performing a chemical treatment in accordance with Federal, State, and Tribal regulations that would support the conservation and recovery of humpback chub, provided that reasonable care is practiced to minimize the effects of such taking.

(A) For treatments upstream of occupied humpback chub habitat:

(1) Service approval is not required; and

(2) Care should be taken to limit the potential for fish toxicants and piscicides traveling beyond treatment boundaries and impacting humpback chub.

(B) For treatments in known or potentially occupied humpback chub habitat:

(1) The Service must approve, in advance and in writing, any treatment;

(2) Care should be taken to perform robust salvage efforts to remove any humpback chub that may occur in the treatment area before the treatment is conducted; and

(C) Whenever possible, humpback chub that are salvaged should be moved to a location that supports recovery of the species.

(vii) *Reporting and disposal requirements.* Any mortality of humpback chub associated with the actions authorized under the regulations in this paragraph (dd)(3) must be reported to the Service within 72 hours, and specimens may be disposed of only in accordance with directions from the Service. Reports in the upper basin (upstream of Glen Canyon Dam) must be made to the Service's Mountain-Prairie Region Law Enforcement Office, or the Service's Upper Colorado River Endangered Fish Recovery Office. Reports in the lower basin (downstream Glen Canyon Dam) must be made to the Service's Southwest Region Law Enforcement Office, or the Service's Arizona Fish and Wildlife Conservation Office. Contact information for the Service's regional offices is set forth at 50 CFR 2.2, and the phone numbers of Law Enforcement offices are at 50 CFR 10.22. The Service may allow additional reasonable time for reporting if access to these offices is limited due to office closure or if the activity was conducted in an area without sufficient communication access.

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Martha Williams,

Principal Deputy Director, Exercising the Delegated Authority of the Director, U.S. Fish and Wildlife Service.

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