

The 5-year status review under the ESA is an important document as it provides a “report card” on how well “we” are doing in our recovery efforts for a listed species. The status review is linked directly to the requirements (criteria) in the recovery plans for each species. Thus, a status review is a general look at all of the efforts being made to recover a listed species. These reviews are important because they show areas of positive efforts as well as areas where the species is not being fully supported. It provides a clear indication of whether you are on the road to recovery (i.e., recovering) or whether there are actions or situations which are limiting recovery. If a species is recovering (on a trajectory to meeting recovery criteria) and threats are being ameliorated you would expect that section 7 consultations on continuing actions to likely be favorable. Conversely, if a species is declining and below its demographic (population numbers) criteria then you might expect to be closer to jeopardy or adverse modification of critical habitat in a section 7 consultation.

The following is a step by step review by Western Area Power Administration (Western) of the 5-year Status Review for Humpback Chub, currently listed as endangered. The first goal of recovery is to meet the downlisting criteria, then eventually the delisting criteria. In general, the review for the upper basin recovery unit appears reasonable but staff from Western have reviewed the recovery criteria for the lower basin recovery unit and found it to be inconsistent with the best available scientific information for humpback chub in the Grand Canyon. Below is a discussion of our concerns with the status review for the lower basin recovery unit.

Lower Basin Recovery Unit of Humpback Chub

Demographic Downlisting Criteria for Humpback Chub

Lower Basin Recovery Unit Criterion 1a: The Grand Canyon population is maintained as a core over a 5-year period, starting with the first point estimate acceptable to the U.S. Fish and Wildlife Service (Service), such that the trend in adult (age-4+; ≥ 200 mm TL) point estimates does not decline significantly.

Service determination: This criterion has been partially met.

Service justification: The justification for why this criterion has only been partially met is unclear. The 5-year review describes the use and acceptance of the age-structured mark-recapture (ASMR) population estimates and provides Figure 2, which shows estimates steadily increasing for at least the last five years of data but does not provide any information as to why the Service did not determine that this criterion has not been fully met.

Western: In the discussion section of the latest draft of the recovery plan that was provided to Western (2008 draft), section 5.4.1 states: “Although population estimates are available for some populations starting in 1998, concurrent and reliable point estimates for all populations began in 2003.” The Service goes on to describe a recovery period that could include downlisting as early as 2008 based on a need to have stable populations for at least 5

years. Thus if the Service believes there are reliable estimates from 2003 on, the population has been steadily increasing at an annual rate of approximately 5% since then (and before then in Grand Canyon), and it is above the MVP (minimum viable population) value described in criterion 1c, then we cannot see why criterion 1a has not been fully met. In addition, beyond the ASMR estimates recent sampling within the LCR by the Service (2009-2011) continues to indicate large population sizes and possibly even greater population growth within this period (Haverbeke et al. 2011). This now equates to a 7-year increase in population sizes with strong vital rates (e.g., juvenile survival, adult survival, survival of translocated fish).

Additionally, on page 7 of the 2011 5-year Status Review for Colorado Pikeminnow, the Service states that if future estimates for the Green River subbasin population of Colorado pikeminnow do not deviate significantly from the previous 3-year mean, the Service would consider this population of pikeminnow as meeting its demographic criterion for downlisting. Yet, the increasing trend in the estimated population size of the Green River population of pikeminnow is not nearly as compelling as the estimated population increases of Grand Canyon humpback chub. It appears as if these two species are being held to different standards when determining whether or not these populations are meeting their respective downlisting criteria, although both have nearly exact demographic recovery criteria. Western staff followed up with Service staff with the lead on the status review and no further explanation could be provided as to why this criterion was not satisfied.

Lower Basin Recovery Unit Criterion 1b: The humpback chub population in Grand Canyon is maintained as a core over a 5-year period, starting with the first point estimate acceptable to the Service, such that the mean estimated recruitment of age-3 (150 to 199 mm TL) naturally produced fish equals or exceeds mean annual adult mortality.

Service determination: This criterion has been partially met.

Service justification: Data for the abundance estimates for age-3 (150 – 199 mm TL) naturally produced humpback chub in Grand Canyon were not included in the 5-year review. In its place, a statement was provided saying that although there has been an increase in young-of-year and juvenile (age-1 to age-3) humpback chub indicating improved juvenile survival and that the increase in adult abundance appears to be driven by this increase in recruitment, the apparent increase in recruitment of age-3 fish may actually be an artifact of an ageing error which has caused what were actually smaller brood fish appear as recent recruits to the adult population.

Western: There may be some contradictory statements regarding this criterion in the 5-year review. The criterion states that mean estimated annual recruitment must continually equal or exceed mean annual adult mortality. Yet on page 6 of the review (section 2.2.2.1) the Service states that this contradicts the best available scientific information in that this

population has and will likely continue to experience fluctuations in demographics and that in a self-sustaining population, like the one in Grand Canyon, recruitment cannot always be expected to equal or exceed adult mortality. This criterion will apparently need to be re-evaluated to allow for naturally occurring fluctuations in demographics found in self-sustaining fish populations.

Additionally, the Service's justification that this criterion has only been partially met appears to have been made based on the fact that there is some uncertainty on how to estimate recruitment of age-3 fish to the adult population and not on the indication that recruitment to the adult population has been exceeding adult mortality for the last five years of data used for the review (see Figure 2). It would seem that arguing about the uncertainties of when and at what size a juvenile humpback chub recruits to the adult population becomes moot when recruitment to the adult population continues to occur at the rate and duration shown in Figure 2. Additionally, these increases in estimated population size at the LCR must be due to an increase in juvenile survival for that aggregation and not from immigration from some outside source. Information from the Near Shore Ecology study with respect to recent mainstem survival rates of juvenile humpback chub indicates that juvenile survival has been much higher than we would have expected (see Reclamation's supplemental biological assessment for a full discussion of recent science). Further, the Service's sampling in the LCR continues to find high juvenile survival rates in the LCR, with some variation, and an indication that the population may be reaching an over-winter carrying capacity (Haverbeke *et al.* 2011). Thus, this begs the question, if the Service's own reports indicate the LCR aggregation may be approaching carrying capacity, that it appears the adult population is successfully utilizing mainstem habitats, and the low probability that the consistent increases in estimated population size could be attributed to anything other than increases in the rate of juvenile recruitment to the adult population, then it is not understood why this criteria has not been fully met.

Lower Basin Recovery Unit Criterion 1c: The Grand Canyon population is maintained as a core over a 5-year period, starting with the first point estimate acceptable to the Service, such that each core population point estimate exceeds 2,100 adults (MVP).

Service determination: This criterion has been met.

Service justification: The Service points out that the adult population estimate for the Grand Canyon population has never fallen below 4,600 individuals. The last available population estimate of 7,650 individuals (2008) indicates this core population still exceeds the MVP of 2,100 individuals. The Service accepts these estimates for as far back as they are calculated and considers the population to be self sustaining.

Western: We agree.

Recovery Factor Downlisting Criteria for Humpback Chub to Minimize or Remove Threats to the Species

Factor A – Adequate habitat and range for recovered populations provided.

Criterion 1: Life stages and habitats of humpback chub in the mainstem Colorado River should be identified and the relationship between individuals in the mainstem and the Little Colorado River should be determined.

Service determination: This criterion has been met.

Service justification: The Service lists several studies that have been done that reportedly show that adult humpback chub tagged in the mainstem Colorado River migrate into the Little Colorado River during the spawning season and subsequently return to the mainstem with substantial site fidelity once spawning has concluded. General consensus is that adult humpback chub use the deeper and more food rich mainstem during the year and enter the Little Colorado River primarily for spawning. Juvenile and young-of-year humpback chub use the Little Colorado River and near shore and backwater habitats in the mainstem as nursery habitat.

Western: We agree.

Criterion 2: Operations of Glen Canyon Dam to benefit humpback chub in the Colorado River through Grand Canyon should be continued and a flow regime to benefit humpback chub in the Little Colorado River should be identified, implemented, evaluated, and revised, such that:

- a. Adequate spawning habitat and appropriate spawning cues (e.g., flow patterns and water temperatures) are available to maintain a self-sustaining population, as reflected by downlisting demographic criteria in section 5.3.1.1.2.
- b. Adequate nursery habitat is available to maintain a self-sustaining population, as reflected by downlisting demographic criteria in section 5.3.1.1.2
- c. Adequate juvenile and adult habitat (e.g., cover, resting and feeding areas) is available to maintain a self-sustaining population, as reflected by downlisting demographic criteria in section 5.3.1.1.2

Service determination: This criterion has been partially met.

Service justification: The justification for why this criterion has only been partially met is unclear. The Service lists several conservation measures and research projects that have been completed or are in process including a reconsultation trigger if the adult population declines significantly or drops below an estimated 3,500 individuals, development of a management and conservation plan, translocations to expand the species range, nonnative

fish control, the nearshore ecology study, the monthly flow transition study, the creation of a refuge population, and the initiation of a watershed plan for the Little Colorado River. The Service does not state, however, what more is needed to meet this criterion.

Western: First of all, the Service appears to have cited the incorrect document for this discussion. The ITS (incidental take statement) from the 2008 Biological Opinion was superseded in a remand document from the court on September 1, 2010. The revised ITS lists a reconsultation trigger of 6,000 adult humpback chub. Thus this document should be revised as it uses an outdated document and incorrect data to base its conclusions. Further, this criterion relies on three factors to be met (2a, 2b, and 2c) which require adequate habitat be made available to meet the adult demographic criteria listed above. Given the previous discussion about our rationale that those criteria have likely been met, that the population at the LCR is self-sustaining and may in fact be reaching carrying capacity, and that the adult population seems to be successfully utilizing the mainstem (Haverbeke *et al.* 2011) as well as high juvenile survival rates (Pine *et al.* unpublished data in Reclamation's BA submitted to the Service), it is unclear how this criterion has not been met. *Note: since writing this a new BiOp has been finalized with a new reconsultation trigger.*

Criterion 3: Effects and feasibility of a temperature control device for Glen Canyon Dam to increase water temperatures in the mainstem Colorado River through Grand Canyon that would allow for range expansion of humpback chub should be determined.

Service determination: This criterion has been met.

Service justification: A risk assessment and scoping environmental assessment for a temperature control device on the penstocks at Glen Canyon Dam have been completed (U.S. Bureau of Reclamation 2004).

Western: We agree.

Factor B – Protection from overutilization for commercial, recreational, scientific, or educational purposes.

Criterion 4: Overutilization of humpback chub for commercial, recreational, scientific, or educational purposes should be reevaluated and, if necessary, actions identified to ensure adequate protection.

Service determination: This criterion has been met.

Service justification: No commercial, recreational, or educational activities exist. Scientifically, reduced survival of adult humpback chub as a result of handling has not been proven, and delayed mortality due to sampling has not been demonstrated.

Western: We agree.

Factor C – Adequate protection from diseases and predation.

Criterion 5: An Asian tapeworm control program should be developed and implemented in the Little Colorado River to identify levels of control that will minimize the negative effects of parasitism on the humpback chub population.

Service determination: This criterion has been met.

Service justification: Ward (2007) developed protocols for treating humpback chub for Asian tapeworm. Arizona Game and Fish Department is implementing those protocols (Clark et al. 2008).

Western: We agree.

Criterion 6: Procedures should be developed, implemented, evaluated and revised for stocking and to minimize escapement of nonnative fish species into the Colorado River and its tributaries through Grand Canyon to minimize negative interactions between nonnative fishes and humpback chub.

Service determination: This criterion has not been met.

Service justification: No procedures have been developed.

Western: We agree.

Criterion 7: Rainbow trout, channel catfish, black bullhead, and common carp control programs should be developed and implemented to identify levels of control that will minimize predation on humpback chub in the Little Colorado River.

Service determination: This criterion has been partially met.

Service justification: The justification for why this criterion has only been partially met is unclear. The Service cites a study by Ward and Persons 2007 but does not state what more is needed to meet this criterion.

Western: The Service should indicate what is necessary to meet this criterion.

Criterion 8: Brown trout and rainbow trout control programs should be developed and implemented to identify levels of control that will minimize predation on humpback chub in the Colorado River through Grand Canyon.

Service determination: This criterion has been partially met.

Service justification: Mechanical removal of brown trout and rainbow trout around the confluence of the Little Colorado River occurred from 2003-2008. Although a declining catch rate was identified over the 5-year period, a level of control has not been determined.

Western: This review fails to reference the immense amount of work currently underway and the EA prepared by Reclamation and currently under review by Service for trout control in Glen and Grand Canyons. This hasn't been concluded yet, but a clearer indication of what is needed would be helpful and recognition of the EA in the review is requested.

Factor D – Adequate existing regulatory mechanisms.

Criterion 9: Mechanisms determined adequate for legal protection of adequate habitat in the mainstem Colorado River through Grand Canyon and the Little Colorado River should be developed.

Service determination: This criterion has been met.

Service justification: The Grand Canyon Protection Act along with the "Law of the River," including interstate compacts, provide flows through Grand Canyon to deliver water to lower basin states and benefit the ecosystem overall. The Glen Canyon Dam Adaptive Management Work Group through its Technical Work Group and the biological opinion for the reoperation of Glen Canyon Dam is the mechanism in which these flows are protected and provided.

A Little Colorado River watershed study is a basin-wide effort to define the problems, identify solutions and options related to protecting and increasing water supplies, preserve/enhance a more natural environment, and improve the health of the watershed. There are multiple jurisdictions over the water resources that are working to develop a coordinated management plan to optimize the water resources to meet the water needs.

Western: We agree.

Criterion 10: Elements of conservation plans are identified that are necessary to provide for the long-term management and protection of humpback chub populations.

Service determination: This criterion has not been met.

Service justification: Conservation plans and the necessary elements have not been developed.

Western: We agree.

Factor E – Other natural or manmade factors for which protection has been provided.

Criterion 11: State and Federal hazardous-materials spills emergency-response plans should be reviewed and modified to ensure adequate protection for humpback chub populations from hazardous-materials spills.

Service determination: This criterion has not been met.

Service justification: The hazardous-material spills emergency-response plans have not been reviewed or modified.

Western: We agree, progress needs to be made here.

Criterion 12: Measures should be identified to minimize the risk of hazardous-materials spills from transport of materials along U.S. Highway 89 at and near the two Cameron bridges spanning the Little Colorado River.

Service determination: This criterion has not been met.

Service justification: No measures have been identified to minimize the risk of hazardous materials spills along U.S. Highway 89 and near the Cameron bridges spanning the Little Colorado River from materials transported along the roadway.

Western: We agree.

Section 2.3 Synthesis

In general, Western disagrees with a number of the determinations that listed recovery criteria as being only “partially met” in the synthesis section and believe that the data and published research listed above supports a “fully met” determination for a number of these criteria. Thus, we request further discussion about these criteria and consideration of the determinations made.