

## Executive Summary

The Bureau of Reclamation (Reclamation), Upper Colorado Region, proposes to conduct research, monitoring and specific actions to control non-native fish in the Colorado River downstream from Glen Canyon Dam in an effort to help conserve native fish. The non-native fish control efforts would be located within Glen Canyon National Recreation Area (GCNRA) and Grand Canyon National Park (GCNP), Coconino County, Arizona. The purpose of the action is to minimize the negative impacts of competition and predation on an endangered fish, the humpback chub (*Gila cypha*) in Grand Canyon. The action is needed because competition and predation by non-native fishes, and in particular rainbow trout (*Oncorhynchus mykiss*) and brown trout (*Salmo trutta*), may be contributing to a reduction in survival and recruitment of young humpback chub and threatening the potential recovery of the species. Rainbow trout and brown trout are not native to the Colorado River Basin and have been introduced into the region as sport fish. The action also addresses the concerns of American Indian tribes over the taking of life associated with non-native fish control.

Because non-native fish, particularly rainbow and brown trout, are known to prey on and compete with the endangered humpback chub, the U.S. Fish and Wildlife Service (USFWS) 2008 Final Biological Opinion on the Operation of Glen Canyon Dam (2008 Opinion; U.S. Fish and Wildlife Service 2008) included a conservation measure that addressed non-native fish control. That conservation measure provided that Reclamation would continue non-native fish control efforts through the Glen Canyon Dam Adaptive Management Program (GCDAMP) and anticipated removal of non-native trout at the confluence of the Colorado River mainstem and the Little Colorado River (LCR), as well as other control methods. The conservation measure was further guided by the USFWS 2009 Supplement to the 2008 Final Biological Opinion on the Operation of Glen Canyon Dam (2009 Supplement; U.S. Fish and Wildlife Service 2009) and the 2010 Reissuance of the Incidental Take Statement on the 2009 Supplemental Biological Opinion on the Operation of Glen Canyon Dam 2008-2012 (2010 ITS; U.S. Fish and Wildlife Service 2010a).

Concerns have been expressed by several of the American Indian tribes that are represented on the Adaptive Management Work Group (AMWG), particularly the Pueblo of Zuni, about the taking of life within a place that is sacred to the tribes and fundamental in several creation stories. Reclamation worked with the U.S. Geological Survey (USGS) USGS Patuxent Wildlife Research Center to conduct a Structured Decision Making (SDM) Project to evaluate various potential methods of controlling non-native fish in the Grand Canyon (SDM Project) for this Environmental Assessment (EA). The purpose of the SDM Project was to use a structured approach to develop and provide substantive input to Reclamation for use in preparation of this EA concerning management of non-native fish below the Glen Canyon Dam. The project served to enlist the cooperating agencies and GCDAMP Tribes in alternative

development and analysis. The final report is provided as an appendix to this EA (Appendix A) and has been used to formulate, analyze, and select alternatives in this EA.

The proposed action is to develop further scientific information regarding native and non-native fishes in the Colorado River and take actions to help conserve the endangered humpback chub by controlling numbers of rainbow trout, brown trout, and other non-native fishes, if necessary. The proposed action would likely increase survival of young humpback chub as well as the three other native fish species that occur in the action area, the flannelmouth sucker (*Catostomus latipinnis*), bluehead sucker (*Catostomus discobolus*), and the speckled dace (*Rhinichthys osculus*). The flannelmouth and bluehead suckers are species that are declining throughout their range and are part of a rangewide conservation plan for native fishes among six western states.

Modeling conducted during the SDM Project indicated that the Proposed Action would have no effect on the Lees Ferry trout population. However, if the proposed action were to reduce total numbers of adult rainbow trout in Lees Ferry, it could result in a healthier, more sustainable population of rainbow trout, with a more balanced age-structure and larger trout of better condition.

Non-native fish control treatments evaluated in the SDM Project and EA processes included flow and non-flow actions to control non-native fish. Although all of these treatments could have desirable effects, based on similar prior actions, there is some uncertainty about the outcome of each treatment if applied individually or in combination with others. The SDM Project was used to identify this uncertainty and analyze the performance of potential actions in reducing non-native fish predation on humpback chub and other objectives, such as cultural resources, hydropower, and recreation. Through the SDM process, and through further analysis in this EA, the proposed action was selected because it best meets the purpose and need to reduce non-native fish predation on humpback chub, reduce uncertainty on aspects of non-native fish control, limit costs of implementing non-native fish control, address concerns by GCDAMP Tribes about the taking of life, and provide the least impact to other resources. A Science Plan to evaluate the proposed action, including a strategy for long-term application and monitoring, is included as an Appendix to this EA (Appendix B).

This Environmental Assessment evaluated the no action and the proposed action relative to the purpose and need for the action. The proposed action was chosen based on its performance in the SDM Project, as will be explained further in “Description of Alternatives” and “Affected Environment and Environmental Consequences” sections. The proposed action is to utilize boat-mounted electrofishing to remove non-native fishes. In any one year, up to 10 non-native fish removal trips would be conducted in the Colorado River below Lees Ferry from the Paria River to Badger Creek Rapid. Removal in the vicinity of the Little Colorado River would only be conducted if monitoring and modeling data indicate that a trigger has been reached as defined in the 2011 USFWS Final Biological Opinion on the Operation of Glen Canyon Dam including High Flow Experiments and Non-Native Fish Control (2011 Opinion; U.S. Fish and

Wildlife Service 2011). In this way, fish would only be removed if there is a clear necessity to do so (triggers are reached). Fish would also be removed alive and stocked into other waters to satisfy tribal concerns, or, and only if live removal fails, fish removed would be euthanized for other beneficial use. Up to 6 removal trips would be conducted in the Colorado River near the Little Colorado River from Kwagunt Rapid to Lava Chuar Rapid in each year of the proposed action. The period of the proposed action is up to 10 years, from 2011-2020. The proposed action would be implemented in accordance with a Science Plan designed to utilize adaptive management to learn from implementing non-native fish control actions. Reclamation would continue to evaluate non-native fish control actions through the GCDAMP during the proposed action. Additional flow and non-flow actions not analyzed here would continue to be evaluated and may be added through adaptive management, such as flow actions to suppress recruitment of rainbow trout in Lees Ferry. These actions may require additional environmental compliance.