

PECE EVALUATION FOR THE LEAST CHUB
2014 CONSERVATION AGREEMENT AMENDMENT

August 5, 2014

Introduction

On September 29, 1995, we published a proposed rule to list the least chub (*Iotichthys phlegethontis*) as endangered with critical habitat (60 FR 50518). A listing moratorium, imposed by Congress in 1995, suspended all listing activities and further action on the proposal was postponed. During the moratorium, a Least Chub Conservation Agreement and Strategy (CCA) was completed in 1998 and the signatories formed the Least Chub Conservation Team (conservation team) (Perkins et al. 1998, entire). As a result of commitments made by signatories to the 1998 CCA (Perkins et al. 1998, p. 10), actions to protect the least chub were developed and implemented. Consequently, we withdrew the listing proposal on July 29, 1999 (64 FR 41061).

In 2005, the conservation team updated the 1998 CCA (Perkins et al. 1998, entire; Bailey et al. 2005, entire). On June 25, 2007, we received a petition from Center for Biological Diversity, Confederated Tribes of the Goshute Reservation, Great Basin Chapter of Trout Unlimited, and Utah Chapter of the Sierra Club requesting that the least chub be listed as threatened under the Endangered Species Act (Act) and critical habitat be designated. Our 90-day finding (73 FR 61007, October 15, 2008) concluded the petition presented substantial information in support of listing. Our subsequent 12-month finding (75 FR 35398, June 22, 2010) identified least chub as a species for which listing as endangered or threatened was warranted but precluded due to higher priority listing decisions. Since publication of our 12-month finding (77 FR 60208), the species' conservation team amended the 2005 CCA in 2014 and committed to additional conservation actions to address identified threats (LCCT 2014, entire). As a result of a multidistrict litigation settlement with petitioners, we are required to make a proposed listing rule or a withdrawal determination by summer 2014 (In re Endangered Species Act Section 4 Deadline Litigation, No. 10-377 (EGS), MDL Docket No. 2165 (D.D.C May 10, 2011)). As part of our analysis we are evaluating the effectiveness of the additional conservation actions that the conservation committee has committed to implement under the 2014 CCA amendment.

Initially formalized in 1998 (Perkins et al. 1998, entire), revised in 2005 (Bailey et al. 2005, entire), and amended in 2014 (LCCT 2014, entire), the CCA is a collaborative and cooperative effort among resource agencies to develop and implement conservations actions for least chub and its habitat. The purpose of the partnership is to ensure the long-term persistence of least chub within its historical range and provide a framework for future conservation efforts. The Utah Department of Natural Resources, Division of Wildlife Resources (UDWR), Bureau of Land Management (BLM), ourselves, Bureau of Reclamation (BOR), Utah Reclamation Mitigation and Conservation Commission (URMCC), Central Utah Water Conservancy District (CUWCD), Confederated Tribes of the Goshute Reservation (previous signatory, but not current

signatory), and Southern Nevada Water Authority (SNWA) are signatories to these agreements and have implemented conservation actions to benefit least chub and its habitat, monitored their effectiveness, and adapted strategies as new information became available. In early 2014, the most recent amendment to the 2005 CCA (2014 CCA Amendment) outlined several new conservation actions that will be enacted to address the threats that were identified in the our June 22, 2010 12-month finding (75 FR 35398), which includes a 2014 Programmatic Candidate Conservation Agreement with Assurances (CCAA) to establish agreements with private landowners or those not signatory to the 2014 CCA Amendment (further discussed below).

On March 28, 2003 (FR 68 15100), the U.S. Fish and Wildlife Service (Service) and National Oceanic and Atmospheric Administration (NOAA) Fisheries published the Policy for Evaluation of Conservation Efforts When Making Listing Decisions (PECE). The purpose of PECE is to ensure consistent and adequate evaluation of recently formalized conservation efforts when making listing decisions. The policy provides guidance on how to evaluate conservation efforts that have not yet been implemented or have not yet demonstrated effectiveness. The evaluation focuses on the certainty that the conservation actions will be implemented and effective. The policy reviews nine criteria for evaluating the certainty of implementation and six criteria for evaluating the certainty of effectiveness for conservation actions. The evaluation criteria are as follows:

The certainty that the conservation effort will be implemented:

1. The conservation effort, the party(ies) to the agreement or plan who will implement the effort, and the staffing, funding level, funding source, and other resources necessary to implement the effort are identified.
2. The legal authority of the party(ies) to the agreement or plan to implement the formalized conservation effort, and the commitment to proceed with the conservation effort are described.
3. The legal procedural requirements (e.g., environmental review) necessary to implement the effort are described, and information is provided indicating that fulfillment of these requirements does not preclude commitment to the effort.
4. Authorizations (e.g., permits, landowner permission) necessary to implement the conservation effort are identified, and a high level of certainty is provided that the party(ies) to the agreement or plan who will implement the effort will obtain these authorizations.
5. The type and level of voluntary participation (e.g., number of landowners allowing entry to their land, or number of participants agreeing to change management practices and acreage involved) necessary to implement the conservation effort is identified, and a high level of certainty is provided that the party(ies) to the agreement or plan who will implement the conservation effort will obtain that level of voluntary participation (e.g., an explanation of how incentives to be provided will result in the necessary level of voluntary participation).

6. Regulatory mechanisms (e.g., laws, regulations, ordinances) necessary to implement the conservation effort are in place.
7. A high level of certainty is provided that the party(ies) to the agreement or plan who will implement the conservation effort will obtain the necessary funding.
8. An implementation schedule (including incremental completion dates) for the conservation effort is provided.
9. The conservation agreement or plan that includes the conservation effort is approved by all parties to the agreement or plan.

The certainty that the conservation effort will be effective:

1. The nature and extent of threats being addressed by the conservation effort are described, and how the conservation effort reduces the threats is described.
2. Explicit incremental objectives for the conservation effort and dates for achieving them are stated.
3. The steps necessary to implement the conservation effort are identified in detail.
4. Quantifiable, scientifically valid parameters that will demonstrate achievement of objectives, and standards for these parameters by which progress will be measured, are identified.
5. Provisions for monitoring and reporting progress on implementation (based on compliance with the implementation schedule) and effectiveness (based on evaluation of quantifiable parameters) of the conservation effort are provided.
6. Principles of adaptive management are incorporated.

These criteria are not considered comprehensive evaluation criteria. The certainty of implementation and effectiveness of a formalized conservation effort may also depend on species-specific, habitat-specific, location-specific, and effort-specific factors. We consider all appropriate factors in evaluating formalized conservation efforts. The specific circumstances will also determine the amount of information necessary to satisfy these criteria.

To consider that a formalized conservation effort contributes to forming a basis for not listing a species or for listing a species as threatened rather than endangered, we must find that the conservation effort is sufficiently certain to be implemented and effective so as to have contributed to the elimination or adequate reduction of one or more threats to the species identified through the section 4(a)(1) analysis. The elimination or adequate reduction of section 4(a)(1) threats may lead to a determination that the species does not meet the definition of threatened or endangered, or is threatened rather than endangered. An agreement or plan may

put in place one conservation effort that is designed to address the primary threats to the species, or may contain numerous conservation efforts, not all of which are sufficiently certain to be implemented and effective. Any conservation effort that is not sufficiently certain to be implemented and effective cannot contribute to a determination that listing is unnecessary, or a determination to list as threatened rather than endangered. Regardless of the adoption of a conservation agreement or plan, however, if the best available scientific and commercial data indicate that the species meets the definition of “endangered species” or “threatened species” on the day of the listing decision, then we must proceed with appropriate rule-making activity under section 4 of the Endangered Species Act (Act). Below is our analysis regarding the application of PECE to the certainty of effectiveness and implementation of the CCA for the least chub, as amended in 2014.

A PECE analysis applies only to conservation efforts that have not yet been implemented or have not yet demonstrated effectiveness. Thus, our analysis focuses on the new actions in the amended 2014 CCA. Many of the actions in the CCA have been implemented since 1998; thus, we can evaluate their effectiveness directly using the actual outcomes rather than through the lens of PECE. Our evaluation of previously enacted conservation actions can be found in our 12-month finding (75 FR 35398, June 22, 2010), the 2014 CCA Amendment, and the 2014 CCAA. In addition, many of the amendments to the CCA included previously implemented (and effective) actions that are now being expanded to other geographic areas. In these cases, we can use the past record of effectiveness in the old geographic areas to analyze success in the new geographic areas.

PECE Analysis

The certainty that the conservation effort will be implemented:

1. The conservation effort, the party(ies) to the agreement or plan who will implement the effort, and the staffing, funding level, funding source, and other resources necessary to implement the effort are identified.

Conservation Efforts:

Since the late-1990s, we have worked with the BLM, UDWR, URMCC, CUWCD, and BOR (and SNWA after 2005) to develop conservation actions for the least chub under a CCA. The CCA was developed with the vision that the conservation actions would be implemented and effective to conserve the species, and would also preclude the need to list.

When the original CCA was implemented, one of its most effective actions was the acquisition of occupied habitat; since 1998, 208 acres have been purchased at Mona (funded by URMCC) to protect least chub habitat from the effects of overgrazing. The CCA also directed and the partners funded thorough searches across the Bonneville Basin for additional populations of least chub; and two additional populations were discovered at Mills Valley and Clear Lake. Furthermore, coordination under the CCA resulted in the creation of fencing exclosures to limit grazing, the full removal of grazing at one natural population site, an agreement with the mosquito abatement districts to limit the introduction and use of western mosquitofish (*Gambusia affinis*), introductions of least chub within historical unoccupied habitat, Memoranda of Understanding (MOU) with grazing operators on private lands (prescribing rotational grazing methods), restoration of habitats, and groundwater monitoring within natural population sites. These completed actions are described in detail in the CCA assessment reports (Bailey 2006, entire; Hines et al. 2008, entire; Jones and Mellon 2009, entire) and tabulated in Appendix 1.

Despite the conservation actions achieved under the original CCA, our June 22, 2010, 12-month finding (75 FR 35398) identified the following threats to the least chub: 1) livestock grazing; 2) groundwater withdrawal; 3) inadequacy of existing mechanisms to regulate groundwater withdrawal; 4) nonnative fishes; 5) the effects of climate change and drought; and 6) cumulative interaction of the individual factors listed above. Based on information provided in the 12-month finding, discussions with least chub biologists and CCA partners, the CCA signatories established a 2014 amendment to the 2005 CCA. The 2014 CCA Amendment evaluated the most recent least chub survey information and habitat conditions and concluded that the following actions are needed to ensure the continued protection of the least chub from ongoing threats: 1) enactment of a programmatic Candidate Conservation Agreement with Assurances (CCAA) with private landowners (completed early 2014); 2) the purchase of grazing rights on UDWR land at Mills Valley; 3) funding for a Population Viability Analysis (PVA) to evaluate natural and introduced populations; 4) implementation of nonnative fish management plans; 5) additional fencing and habitat restoration of key sites, 6) maintenance and monitoring of introduced populations and evaluation of how they offset threats; and 7) completion of a bathymetry study of a natural population site to better understand the relationship between surface water and groundwater; and 8) completion of a UDWR-SITLA landswap for additional

UDWR managed least chub habitat. A full list of the conservation actions in the 2014 CCA Amendment are listed in Appendix 2 and a summary of these actions are listed in Table 1 and evaluated throughout this document.

Table 1. Summary of Conservation Actions in the 2014 CCA Amendment.

Threat	Conservation Actions to Address Threat
Livestock Grazing	Removal of grazing (UDWR-SITLA landswap); purchase of grazing rights (UDWR lands); fencing projects; implementation of grazing management plans through the 2014 Programmatic CCAA; and restoration of impacted habitat.
Groundwater Withdrawal, Climate change and Drought	Monitoring and evaluation via a bathymetry and habitat study, and maintaining a monitoring well network. Habitat restoration and maintenance of corridors among springheads; Russian olive removal, and continued development of protected introduced populations.
Nonnative Fishes	Development and implementation of nonnative fish management plans, continued development of protected introduced populations.
Climate Change and Drought	Completion of a PVA to evaluate natural and introduced populations; and maintenance and monitoring of introduced populations and evaluation of how they offset threats.

Parties to the Agreement: The signatories to the 2014 CCA Amendment include the Service, the BLM, UDWR, URMCC, CUWCD, BOR, and SNWA. The BLM, UDWR and URMCC have management authority over their respective lands and comprise the majority of land ownership of least chub habitat. We assist BLM and UDWR with designing and prioritizing conservation projects and evaluating monitoring data. The three remaining agencies (CUWCD, BOR and SNWA) provide a representative to the interagency conservation team and work in cooperation with members of the agreement to implement actions identified in the 2014 CCA Amendment. In addition, they consider possible impacts of their agency activities and plans on least chub and their habitat and commit to avoid and/or mitigate such impacts whenever possible within the constraints of their respective policy and authority.

Funding:

From the time of the signing of the 1998 CCA through 2013, funding and in-kind services to enact conservation actions were provided by a variety of sources including us, BLM, UDWR (through the State’s Endangered Species Mitigation Fund), and URMCC. Funding and agency staff time are made available on an annual basis to monitor the status of least chub populations, conduct research, implement conservation actions and monitor results, enforce compliance with regulations, and maintain conservation area boundaries (i.e., BLM Area of Critical Environmental Concern). In-kind contributions in the form of personnel, field equipment, and supplies were also provided by the CCA participants. While it is understood that all funding and other agency resource commitments made under this Amendment are contingent upon

appropriations by the respective entities, through this amendment, partners anticipate maintaining prior and ongoing funding levels and in-kind contributions until which time conservation partners agree to having achieved, or partially achieved, the conservation goals for least chub to the extent that this level of funding is no longer needed.

The CCA signatories are committed to continue funding conservation measures for the least chub. Specifically, the BLM has secured additional funds for the PVA to evaluate natural and introduced populations and the fencing projects committed to under the 2014 CCA Amendment, beyond the primary funds allotted for maintenance and monitoring activities. We secured additional funds for the bathymetry and habitat evaluation study in the Snake Valley to better understand the relationship between surface water and groundwater. The UDWR secured additional funds for the purchase of grazing rights at Mills Valley and provided lands to complete the landswap package with SITLA. UDWR, through its Endangered Species Mitigation Fund, anticipates the continued funding for the monitoring of least chub habitats, habitat restoration of impacted sites, management of introduced populations to evaluate current threats, implementation of nonnative fish management plans, and monitoring effectiveness of implemented actions and to ensure genetic security in the event of severe drought or if climate change impacts natural populations severely.

As documented in the 2014 CCA Amendment, from 2005 through 2013 conservation committee signatories have spent approximately \$1.07 million on conservation, monitoring, research, and land acquisition efforts for the least chub (funds prior to 2005 were not included in the total). In future years, conservation committee signatories have committed to provide at least \$80,000 per year for similar activities. Based on a track record of substantial annual funding from the signatories, we have a high degree of certainty that funding will continue to be available to implement conservation actions for the least chub.

2. The legal authority of the party(ies) to the agreement or plan to implement the formalized conservation efforts, and the commitment to proceed with the conservation efforts are described.

Section 2 of the ESA allows us to enter into a CCA with other cooperating partners. Section 2 of the ESA states that encouraging interested parties, through Federal financial assistance and a system of incentives, to develop and maintain conservation programs is a key to safeguarding the Nation's heritage in fish, wildlife, and plants. Similarly, Title 23, Chapter 22.1 of the Utah Code allows State agencies, such as the UDWR, to enter into cooperative agreements and programs with other state agencies, federal agencies, municipalities, counties, landowners and other individuals for purposes of wildlife conservation.

The Federal Land Policy and Management Act (FLPMA, Section 307, 43 USC 1737), which provides overall direction to the BLM for conservation and management of public lands, allows the BLM to participate in conservation agreements. The BLM manual, Section 6840 (Special Status Species Management) provides overall policy direction to BLM managers to conserve listed threatened or endangered species on BLM administered lands, and to assure that actions authorized on BLM administered lands do not contribute to the need to list species deemed by BLM to be "sensitive." Methods and procedures of conservation include, but are not limited to, all activities associated with scientific resources management such as research, census, law

enforcement, habitat acquisition and maintenance, propagation, and transportation. As applied to special status species, conservation means to use, and the use of, methods and procedures such that there is no longer any threat to their continued existence or need to continue their status as a special status species. Additionally, the BLM has land use management plans, specifically, the BLM Fillmore Field Office's 1993 House Range Resource Area Resource Management Plan Amendment that designated Gandy Marsh (an area occupied by least chub) as an Area of Critical Environmental Concern (ACEC), which provides additional management and protection for this species (BLM 1993, entire).

The national interagency Memorandum of Understanding (MOU) for the conservation of species tending towards federal listing issued on January 25, 1994 (94-SMU-058) provides the general framework for cooperation and participation among cooperators in conservation of these species. The CCA is consistent with the provisions of the national interagency MOU.

The URMCC was authorized under the Central Utah Project Completion Act of 1992 (CUPCA; PL 102-575) and established in 1994. CUPCA set terms and conditions for completing the Central Utah Project (CUP), which diverts, stores and delivers large quantities of water from numerous Utah rivers to meet the needs of central Utah's citizens, which is managed by several agencies, including CUWCD. The URMCC is therefore responsible for designing, funding and implementing projects to offset the impacts to fish, wildlife and related recreation resources caused by CUP and other federal reclamation projects in Utah. Through CUPCA, URMCC has purchased least chub occupied habitat, for continued protection of the species.

In summary, we have a high degree of certainty that the parties to the CCA have the legal authority and direction through regulatory mechanisms such as the ESA, Utah Code, FLPMA and CUPCA, to implement conservation efforts for the least chub. The commitment to implement conservation measures is demonstrated by the fact that these same parties have implemented substantial conservation measures for the least chub since 1995 (see Conservation Efforts, Funding, above; Appendix 1).

3. The legal procedural requirements (e.g., environmental review) necessary to implement the efforts are described, and information is provided indicating that fulfillment of these requirements does not preclude commitment to the efforts.

For BLM lands, the BLM completed a National Environmental Policy Act (NEPA) analysis (i.e., Environmental Impact Analysis [EIS]) for their House Range Resource Management Plan (House RMP) that overlaps with least chub habitat (BLM 1987, entire). The House RMP was amended in 1993 to designate Gandy Marsh (a least chub occupied habitat in the Snake Valley) as an ACEC providing additional management and protection for this species (BLM 1993, entire). The House RMP identifies least chub as a sensitive species and directs and approves implementation of maintenance and improvement projects for least chub habitats. For large-scale projects not covered under the categories of maintenance or habitat improvement, additional NEPA review would be required, since it would not be covered under the House RMP EIS. Federal signatories to the 2014 CCA Amendment would be consulted on any projects that may require NEPA review and compliance, however the projects committed to by the BLM under the 2014 CCA Amendment are either covered under the House RMP EIS or are

categorical exclusions (actions that do not have significant environmental impacts, per 40 FR 1508.4) and thus do not require further approvals outside of BLM.

On State lands, UDWR Policy W2AQ-4 and Administrative Rule R657-48 identifies those species in the state that are the most vulnerable to population or habitat loss and least chub is listed on this Utah Sensitive Species List (UDWR 2011, p. 2). The purpose of the list is to encourage management actions such as conservation strategies for these species. Such actions have occurred for least chub under the 1998 and 2005 CCAs and the 2014 CCA Amendment. There are no environmental review requirements under the policy and rule, therefore approvals or other legal procedural requirements are not required for UDWR projects committed to in the 2014 CCA Amendment.

No environmental reviews are required for conservation actions or projects implemented on private lands, however, implementation of activities on private lands require permission from the landowner. The Programmatic CCAA is intended to provide a formal agreement with the landowner and commitment by the signed parties to carry out the agreed to actions and activities. However, the CCAA is not a requirement for the implementation of projects or activities on private lands.

The only legal procedural requirement and environmental review necessary for projects committed to in the 2014 CCA Amendment are those that occur on BLM lands. Previously implemented projects and activities, such as fence construction, maintenance, permit issuance, and allowance of access by UDWR for least chub monitoring are covered under the House Range RMP EIS or through NEPA Categorical Exclusions which are internally reviewed by BLM and approved due to their lack of significant environmental impacts. We conclude that fulfillment of environmental requirements will not preclude participating cooperators' abilities to complete these conservation actions.

4. Authorizations (e.g., permits, landowner permission) necessary to implement the conservation efforts are identified, and a high level of certainty is provided that the party(ies) to the agreement or plan who will implement the effort will obtain these authorizations.

The BLM, UDWR and URMCC (although URMCC lands are monitored by UDWR) have management authority over their respective lands and comprise the majority of land ownership of least chub habitat (see Table 2 under criterion 5, below). We assist BLM and UDWR with designing and prioritizing conservation projects and evaluating monitoring data. Through the CCA, these parties have agreed to implement the required conservation actions on their lands, which include, habitat restoration, removal of grazing from select areas, implementation of nonnative fish management plans and continued monitoring of least chub populations. No additional authorizations are necessary.

Least chub also occur on privately owned lands—four of the six natural least chub populations partially occur on private lands, and one landowner supports an introduced least chub population on their property (Table 2, below). Additional agencies, the Department of Defense (DOD) and the Salt Lake City School District (School District), also have introduced least chub populations on their respective properties. We have established Memoranda of Understanding (MOUs) or

other similar agreements (i.e., Wildlife Extension Agreements, individual CCAA) with two private landowners at naturally occurring populations (Leland Harris and Bishop Springs), and for the introduced populations on DOD and School District lands. The MOUs and similar agreements have successfully protected least chub from grazing (private owner at Leland), provide water rights for instream flow for least chub (private owner at Bishop via CCAA) and ensured continued protection of the least chub habitat (on DOD and School District property). One private landowner at Gandy Marsh has covered springheads and decreased grazing densities through his cooperation with UDWR, but is not under an MOU (this landowner was not included in the total number above since there was no formal agreement even though his efforts have provided benefit and protection for least chub). Landowners, such as the latter at Gandy, have requested enrollment in the Programmatic CCAA, which is expected to be completed by May 2014. Landowner permission is required to access private lands—the Programmatic CCAA provides a formal agreement with specific conditions regarding property access by UDWR for monitoring activities (similar to a MOU), but in return, provides assurances to the landowner in the event that the species is listed. Currently, there are five agreements in place, providing access to two natural populations (occurring on private land) and three introduced populations (on private, DOD and School District lands). The remaining private lands and SITLA lands are accessible by individual requests for access, but no conservation actions are required on these lands under the 2014 CCA Amendment.

In summary, authorization is not needed on the majority of occupied habitat, since it is largely owned by CCA signatories (BLM, UDWR, URMCC). Private lands at two of the four sites with natural least chub populations are accessible to agency personnel for conservation activities through previous agreements (MOUs or similar). All of the introduced populations that are not on lands managed by the signatory agencies have a MOU in place, providing the appropriate authorizations. The remaining lands with least chub that are not accessible without prior landowner approval are those on SITLA and private lands at two of the natural least chub sites, but these sites are accessible through CCA signatory lands (since they are only partially owned by SITLA or private owners) and do not require conservation action implementation. Therefore, we have a high degree of certainty that the proper authorizations are in place to implement conservation actions for the least chub on lands where the actions will occur.

5. The type and level of voluntary participation (e.g., number of landowners allowing entry to their land, or number of participants agreeing to change practices and acreage involved) necessary to implement the conservation effort is identified, and a high level of certainty is provided that the party(ies) to the agreement or plan who will implement the conservation effort will obtain that level of voluntary participation (e.g., an explanation of how incentives to be provided will result in the necessary level of voluntary participation).

As described under criterion 4 (above), the majority of the lands with occupied least chub habitat are owned and managed by BLM, UDWR and URMCC—7 of 10 introduced sites and 2 of 6 natural sites (Table 2). The remaining three introduced sites are managed under individual MOUs with private landowners. The remaining four natural sites are partially owned and managed largely by the CCA signatories (with private and SITLA owned parcels also at these sites). The private parcels at Leland Harris and Bishop Springs (natural populations) are managed under agreements with the private landowners (i.e., Wildlife Extension Agreements and

individual CCAA) that provide protections to least chub and their habitat (see criterion 4 for the details of these specific protections). The private landowner at Gandy Marsh (natural population) is not under a formal agreement, but has worked with UDWR to cover springheads and decrease grazing densities for the management of least chub. The only remaining natural population site where no MOUs are in place is Mills Valley. UDWR owns 20 percent of the habitat and the remainder is privately owned by about 11 different landowners.

Table 2. Least chub populations by type, presence of water right and percentage of land by owner.

Least Chub Site	Type	Water Right	Land Ownership (Percent)						
			BLM	State of Utah	SITLA	Private	URMCC	Local Gov't	Dept. of Defense
Mona Springs	Natural	No					100		
Clear Lake	Natural	Yes		100					
Mills Valley	Natural	No		20		80			
Leland Springs	Natural	No	5	28 ¹	swap ¹	67 ²			
Gandy Marsh	Natural	Yes	79		2	19 ²			
Bishop Springs	Natural	Yes	47		41	12 ²			
Fitzgerald WMA	Introduced	Yes		100					
Rosebud Top Pond	Introduced	Yes				100 ²			
Cluster Springs	Introduced	Yes	100						
Pilot Spring SE	Introduced	Yes	100						
Escalante Elementary	Introduced	Yes						100 ²	
Upper Garden Creek	Introduced	Yes		100					
Deseret Depot	Introduced	No							100 ²
Red Knolls Pond	Introduced	Yes	100						
Keg Spring	Introduced	Yes	100						
Pilot Spring	Introduced	Yes	100						

¹Landswap between UDWR and SITLA finalized; land is now UDWR managed and owned.

²Under agreements such as MOUs, Wildlife Extension Agreement, individual CCAA or informal agreement.

One of the conservation actions committed to in the 2014 CCA Amendment is the encouragement of private landowners to enroll in the Programmatic CCAA, including landowners currently under an MOU or other agreement with UDWR. Landowner enrollment in the Programmatic CCAA would allow 2014 CCA Amendment signatories to carry out additional conservation activities on private lands, however enrollment into the Programmatic CCAA is voluntary and no landowners are required to participate. The landowners at Leland, Gandy and Bishop, currently under agreements have requested enrollment under the Programmatic CCAA, and will likely convert to this new agreement in several months. It is also anticipated that about 30 to 40 percent of the private landowners at Mills Valley will participate in the CCAA (C. Crockett 2014, pers. comm.). Although the participants can cancel their enrollment at their discretion, there are incentives built into the program to increase the likelihood of continued participation. For example, the CCAA provides assurances to participating cooperators that

there will not be additional restrictions on their activities, above and beyond those agreed to in their Certificate of Inclusion (CI; the signed agreement for participants). Conservation actions are specific to the unique conditions of each landowner and their current management activities and can range from grazing management plans, nonnative fish management actions, to introduction of least chub populations on the property. Once the participant voluntarily enrolls property, the conservation actions become required to retain the benefits of enrollment. However, these assurances apply only as long as the enrollee continues to participate and to implement conservation actions within the CI. In addition, funding is sometimes available to help the landowner with livestock management activities such as the construction of fencing, which may provide further incentive for continued participation in the CCAA.

Although the agreements are voluntary, participants such as ranchers have an incentive to continue to participate, because participation provides certainty and a stable foundation for planning and future growth. Cooperating landowners may voluntarily withdraw at any point, with 60 days written notice. However, cooperators at three of the four natural populations (where there are private lands) and all 3 introduced population site owners (non-CCA signatory agencies) are actively carrying out conservation actions through a MOU or similar agreement, prior to the recent development of the Programmatic CCAA. Therefore, there is a high level of certainty that the conservation actions specific to the encouragement of private landowners to enroll in the Programmatic CCAA (or convert to this agreement) will obtain a high level of voluntary participation in least chub conservation.

6. Regulatory mechanisms (e.g., laws, regulations, ordinances) necessary to implement the conservation efforts are in place.

As discussed in criterion 2 (above), the parties to the 2014 CCA Amendment have the legal and regulatory authority to implement the agreement.

7. A high level of certainty is provided that the party(ies) to the agreement or plan who will implement the conservation effort will obtain the necessary funding.

As discussed in criterion 1 (above), the parties to the 2014 CCA Amendment have spent approximately \$1.07 million on conservation, monitoring, research, and land acquisition efforts for the least chub between 2005 and 2013. In future years, conservation committee signatories have committed to provide at least \$80,000 per year for the conservation actions outlined in the 2014 CCA Amendment, which include but are not limited to, removal or modification of grazing regimes, additional fencing, restoration of impacted least chub habitat, continued monitoring efforts, completion of funding-specific research projects, and development and implementation of nonnative fish management plans and removal efforts. Therefore, we have a high degree of certainty that funding will continue to be available to implement conservation actions for the least chub. Further information and funding commitments by agency is documented in the 2014 CCA Amendment.

8. An implementation schedule (including incremental completion dates) for the conservation effort is provided.

The 2014 CCA Amendment identifies conservation actions and provides an implementation schedule with explicit completion dates (Appendix 2). Many of the conservation actions will

occur on an annual basis, such as, maintenance of fencing, annual monitoring, submission of reports and conservation team meetings, which are not assigned a specific date, but have successfully been met under the previous agreements and are anticipated to be implemented within the same time period as in previous years.

9. The conservation agreement or plan that includes the conservation effort is approved by all parties to the agreement or plan.

The 2014 CCA Amendment includes all the conservation actions agreed to by the respective agencies and was signed by us, BLM, UDWR, CUWCD, URMCC, and SNWA, effective on the date signed by each party.

Table 3. Parties to the 2014 CCA Amendment and the respective signature dates.

Party	Approval/ Signature Date
BLM	3/21/2014
UDWR	3/6/2014
Service	2/25/2014
BOR	2/26/2014
CUWCD	4/3/2014
URMCC	2/27/2014
SNWA	5/14/2014

The certainty that the conservation effort will be effective:

1. The Nature and Extent of the Threat Is Addressed.

The 2014 CCA Amendment and the 2010 12-month finding described threats to the least chub including livestock grazing, groundwater withdrawal, inadequacy of existing mechanisms to regulate groundwater withdrawal, nonnative fishes, climate change, and drought. The conservation actions outlined in the 2014 CCA Amendment are designed to significantly reduce the identified threats and their impacts to least chub and their habitat.

Livestock grazing

Efforts to control and minimize livestock grazing related damage are ongoing. No livestock grazing occurs at the least chub introduced population sites (with the exception of one site that has occasional seasonal grazing, but no documented impacts associated with this seasonal grazing). However, a minimal level of livestock grazing occurs on a portion of habitat at four of the six naturally occurring least chub sites. A few instances of localized extensive livestock grazing-related damage have occurred in the last couple of years, and livestock grazing on private lands where least chub occur remains partially unregulated. Livestock are effectively excluded from portions of occupied habitat through previous conservation actions under the original CCA. UDWR is pursuing several proactive actions to reduce the remaining grazing

impacts (e.g., UDWR 2012, pp. II-18). Such actions include purchasing grazing rights on UDWR-owned land at Mills Valley, encouraging landowner enrollment in the Programmatic CCAA, and restoring habitats impacted by grazing at all naturally occurring least chub sites.

The conservation actions under the 2014 CCA will maintain or increase the percentage of protected habitat at naturally occurring least chub sites (e.g., through land swaps, purchase of grazing rights and enrollment in the CCAA) and increase the percentage of springheads directly protected from grazing (e.g., fencing projects and land ownership change) (see Table 2 for land ownership percentages). The increase in percentage of protected habitat at each naturally occurring site as a result of these actions, are as follows

- Leland Harris: increase from 72 percent (BLM owned and Private MOU for grazing management) to 100 percent with the addition of UDWR landswap.
- Gandy Marsh: maintain 98 percent (79 percent BLM owned and 19 percent Private—under informal agreement). The CCAA would further secure the private parcel.
- Bishop Springs: maintain 59 percent (12 percent Private—isolated and inaccessible to livestock; and 47 percent BLM owned). Upon completion of the fencing project at Bishop, 100 percent of the springheads will be inaccessible to livestock.
- Mills Valley: increase from 0 percent (grazing currently allowed on UDWR land) to 20 percent (UDWR to remove grazing upon purchase of grazing rights). The CCAA with private landowners should increase protected habitat by an additional 30-40 percent, for a total of 50-60 percent.
- Mona Springs: maintain 100 percent protected from grazing, livestock removed in 2005.
- Clear Lake: maintain 100 percent protected from grazing, no livestock grazing on the UDWR managed WMA.

In summary, the conservation actions initiated through the 2014 CCA Amendment increase the percentage of protected lands at naturally occurring least chub sites with current grazing activities.

Groundwater withdrawal, inadequacy of existing mechanisms to regulate groundwater withdrawal, drought, and climate change

Water levels of springs are important in the life history of least chub (Lamarra 1981; Crist and Holden 1990). Springs are dependent on underground water sources that flow from mountains into low-lying valleys. Several proposed large-scale groundwater-development projects in eastern Nevada and western Utah had the potential to lower groundwater levels and reduce groundwater-fed spring flow at sites populated by least chub (BLM FEIS 2012, p. 3.3.2.10). However, the SNWA pumping project authorized under the BLM ROD (2012, entire), is no longer considering pumping from Snake Valley (on the Nevada side of the Utah-Nevada shared basin). In addition, through Federal legislation, the Lincoln County Conservation, Recreation, and Development Act of 2004 (LCCRDA 2004, entire), has stated under § 301(3), that:

Prior to any transbasin diversion from ground-water basins located within both the State of Nevada and the State of Utah, the State of Nevada and the State of Utah shall reach an agreement regarding the division of water resources of those

interstate ground-water flow system(s) from which water will be diverted and used by the project. The agreement shall allow for the maximum sustainable beneficial use of the water resources and protect existing water rights.

To date, no agreement between Utah and Nevada has been signed, and thus no transbasin groundwater diversions are expected. However, in-state diversions can still occur within Snake Valley. In response, we, UDWR, and BLM have agreed to continue to petition and formally protest new water rights applications that infringe on the respective agency’s water rights and their lands that contain least chub. In addition, SNWA is a signatory to the 2014 CCA Amendment and is committed to protecting least chub from the effects of groundwater withdrawal.

In an effort to monitor groundwater levels and associated withdrawals in the Snake Valley, Utah Geological Survey and UDWR have installed and actively maintain a groundwater monitoring network throughout the Snake Valley, including piezometers within or adjacent to natural least chub populations. Through this continuous monitoring, interannual and seasonal variation can be tracked to establish baseline conditions. Potential changes to baseline conditions, either as a result of future water development, drought or climate change, will be detectable with this monitoring network and adaptive management strategies will be employed when changes to baseline conditions present a concern for least chub. Site-specific knowledge regarding groundwater levels and habitat inundation is being further evaluated at Leland Harris and results will be forthcoming.

The remaining natural populations outside of the Snake Valley occur in closed groundwater rights basins, where the Utah Division of Water Rights (UDWRi) has designated the areas closed to further groundwater development (Table 4). Nine of the 10 introduced sites occur within open or restricted groundwater rights basins, which allow limited groundwater development (Table 5). However, all 10 introduced sites have a water right, legally ensuring senior rights over any new appropriations in the vicinity of these sites (Table 5).

Table 4. Water rights ownership, basin number, status and closure date associated with the naturally occurring least chub populations.

Natural Site	Water Right Owner	Water Right Basin	Water Right Basin Status	Date Closed
Mona Springs	--	53	Closed	1995 ¹
Mills Valley	--	66	Closed	1997 ²
Clear Lake WMA	UDWR	67	Closed	2003 ³
Leland Harris	--	18	Open	--
Gandy Marsh	BLM	18	Open	--
Bishop Springs	BLM & UDWR	18	Open	--

¹ Northern Juab Valley Ground Water Policy

² Water Rights Policy, Sevier River Basin

³ Ground Water Management Plan for Pahvant Valley

Table 5. Water rights ownership, basin and status, and USGS Development Zone associated with introduced least chub sites.

Introduced Site	Water Right Owner	Water Right Basin	Water Right Basin Status	Restricted Areas Specific Policy
Fitzgerald WMA	UDWR	15	Restricted	Rush Valley
Rosebud Top Pond	Private	13	Open	Park Valley
Cluster Springs	BLM	13	Open	--
Upper Garden Creek	Utah Parks	31	Open	--
Red Knolls Pond	BLM	13	Open	--
Keg Spring	BLM	13	Open	--
Pilot Spring	BLM	13-0	Restricted	Curlew Valley
Pilot Spring SE	BLM	13-0	Restricted	Curlew Valley
Escalante Elementary	Local Govt	59	Closed ¹	--
Deseret Depot	DOD	15	Restricted	Rush Valley

¹ Salt Lake Valley Ground Water Management Plan

The purpose of the introduced populations is to provide security for existing populations by providing redundancy, representation and resiliency to the naturally occurring least chub populations, thereby protecting against catastrophic loss, and mitigating current and future threats that may affect naturally occurring populations, such as climate change and drought. The draft Population Viability Analysis determined that the introduced sites show high resilience to catastrophic events and contain all the constituent elements necessary for least chub persistence; however, by protecting a variety of habitats throughout the species' historical range, we increase the probability that the species can adjust to various limiting factors that may affect the population in the future, such as climate change and drought conditions. These established additional populations will help to mitigate the potential that some populations may become unable to support the species at some time in the future.

Nonnative fishes

Although nonnative fishes occur in several of the natural least chub populations, mosquitofish pose the largest nonnative threat to the least chub because of its known aggressive predation on eggs and young of other fishes (Meffe 1985; Sigler and Sigler 1987). Least chub juveniles are the most vulnerable to mosquitofish predation (Mills et al. 2004). For this reason, UDWR under the CCA worked with the mosquito abatement districts in Utah to restrict stocking of mosquitofish for the protection of least chub through a signed MOU. A Nonnative Fish Management Plan (NFMP) was developed for Clear Lake and while there is not a plan in place for Mona, active habitat management, nonnative fish removal, and least chub stocking have taken place to maintain the least chub population at this site. To date, implementation of the Clear Lake WMA NFMP has resulted in the successful control of common carp from the site, which pose a lesser threat to least chub than do mosquitofish. In the fall of 2013, mosquitofish were detected during annual sampling at Mills Valley. The likely source is overland sheet flow from the Sevier River during a recent flood event. The 2014 CCA Amendment's conservation

actions specifically include the development of a NFMP for this site. An adaptive management approach will be employed where nonnative control efforts will be monitored for their effectiveness and information gained through these monitoring efforts will be incorporated into future nonnative control strategies.

As mentioned above under the groundwater, climate change and drought section, the purpose of the introduced populations is to provide additional security for existing populations by providing redundancy, representation and resiliency to the naturally occurring least chub populations, thereby protecting against catastrophic loss, and mitigating current and future threats that may affect naturally occurring populations, such as effects from nonnative fishes. The 10 introduced sites do not contain mosquitofish, per the requirements and criteria for successful introduced populations, and therefore, can help to mitigate the potential that some populations may become unable to support the species at some time in the future.

In summary, the nature and extent of threat is adequately addressed for the threats identified in our 2010, 12-month finding—livestock grazing, groundwater withdrawal, inadequacy of existing groundwater withdrawal regulatory mechanisms, nonnative fishes, climate change, and drought. The 2014 CCA, as evidenced by the successful implementation of conservation actions since 1998, has successfully identified the types of threats to the species and implemented actions to address these threats including the purchase of lands, management of grazing activities, assessment of water availability and water rights, and the management of nonnative fish species. Due to the successful track record provided by the CCA signatories since 1998 we are confident that ongoing conservation efforts will be effective.

2. Incremental Objectives Are Stated

We analyzed whether explicit incremental objectives for the conservation efforts and dates for achieving them are stated in the 2014 CCA Amendment. This criterion is designed to ensure that, if information is incomplete, implementation can nevertheless proceed to move towards incremental objectives until the additional information is available, at which time implementation can be modified in accordance with the new information (68 FR 15103, 15105-06).

To address livestock grazing, UDWR will finalize a land-swap package that includes the 739 acre SITLA property at Leland Harris, and also complete the purchase of grazing rights for Mills Valley to remove current grazing activities on the 80 acre UDWR-owned parcel. These activities commenced approximately six months prior to signature of the 2014 CCA Amendment, project progress is reported to the conservation team on a regular, reoccurring basis, and these actions will be completed by September 2015.

The bathymetry and habitat assessment study at Leland Harris, which has also commenced, has incremental objectives clearly outlined in the funding agreement, and include data collection dates, specific interim updates and reporting deadlines. Furthermore, the bathymetry and groundwater level model will be extrapolated to other sites in the Snake Valley, providing a secondary incremental objective to the study, relating water level changes to piezometer (monitoring well) readings to establish a relationship between surface water level and wetland inundation. The interim and final project products will be provided to the conservation team by the due dates stated in the 2014 CCA Amendment.

The Population Viability Analysis (PVA) being conducted by Oregon State University has clearly defined deadlines and objectives to meet, including an evaluation of extinction risks of natural and introduced population sites, occupancy rates of least chub sites, development of a model to evaluate new monitoring data, and a method to develop a Structured Decision Making (SDM) model to aid in management implementation. The PVA and SDM models will allow the conservation team to adaptively manage grazing at the natural sites (and applicable introduced sites) based on monitoring results of the current management actions, and modify actions as necessary to minimize grazing impacts at natural and applicable introduced sites. The conservation team will also use the decision model as guidance for grazing management and implement the grazing recommendations based on the model. The PVA coupled with the in-depth bathymetry study at Leland Harris will guide our management of the species under changes in drought and climate change conditions by providing the relationship of water body dimensions to seasonal precipitation, temperature, and ground and surface water levels, as additional incremental objectives committed to in the 2014 CCA Amendment.

Nonnative fish threats will be addressed through development and implementation of Nonnative Fish Management Plans, with committed due dates for finalization. The success with these plans will be used in adaptive management planning to accommodate changes necessary to improve the effectiveness of nonnative fish removal activities within occupied habitat. The conservation team will review these actions on an annual basis for their implementation and effectiveness; as UDWR agreed to provide documentation on current nonnative removal efforts and the effectiveness of their efforts in order for the conservation team to evaluate and adaptively manage for nonnative fish species.

Since 1979, 30 introductions of least chub to new locations range-wide were attempted by UDWR. Early introductions were not highly successful, but additional information on least chub habitat requirements has informed later introductions, and increased the success rate of introduced least chub populations. The conservation team finalized criteria necessary for an introduced site to be considered successful, which are detailed in the 2014 CCA Amendment—the conservation team decided in 2013 that a successful introduced population must have at least two seasons of documented recruitment and must face no significant threats at the site; otherwise it was considered an experimental introduction until these conditions could be met (LCCT 2013, p. 3). Although introduction sites are selected based on their low level of existing threats, a thorough threat assessment is conducted prior to least chub introduction at the site. The 10 introduced populations that meet the success criteria fully represent the three GMUs and naturally occurring populations, with the exception of the naturally occurring population at Clear Lake (although a genetic backup is supported in a hatchery until an introduced population site can be selected). These 10 introduced sites successfully represent and conserve the genetic diversity of least chub and provide sufficient populations as a margin of safety for the species. Any additional introduced populations in the future, as agreed to in the Amendment, would follow these criteria.

The conservation team will meet at least once annually to review the status of the least chub, develop yearly conservation action schedules, review the conservation strategy, and modify the strategy as appropriate. This process has occurred annually from 1998 through 2014. Therefore, we have a high degree of certainty that the specified conservation actions committed to in the

2014 CCA Amendment will be achieved as they have explicit objectives defined and the associated dates (see Appendix 2) for achieving them are stated.

3. Steps Necessary for Implementation Are Identified

We determined whether the steps necessary to implement the conservation action were identified in detail. The 2014 CCA Amendment clearly defines each conservation action that will be implemented in least chub habitat as well as the history of similar conservation actions that have been enacted since the 1998 CCA was signed. Since the implementation steps are clearly defined in the CCA (as shown in Table 5 below), and we know that similar actions have worked in the past to provide successful conservation for the species, we have a high degree of certainty that the CCA provides the necessary steps to ensure implementation of the conservation actions.

Table 5. Steps needed for implementation of each conservation action.

Conservation Action	Steps needed for Implementation
Removal of grazing on UDWR lands	<ul style="list-style-type: none"> • Complete SITLA landswap • Complete purchase of grazing rights at Mills Valley • Remove grazing from SITLA and Mills once transactions are completed
Programmatic CCAA and implementation of grazing management plans	<ul style="list-style-type: none"> • Encourage landowner signup • Convert MOUs or similar agreements with landowners to CCAA • Implement grazing management plans as required under CCAA (if grazing-related impacts occur onsite).
Restoration of impacted habitat	<ul style="list-style-type: none"> • Continue restoration efforts, as in previous CCAs • Use a schedule and prioritization list for sites • Complete fencing project at Twin Springs, including habitat restoration component by deadline
Monitoring and evaluation via a bathymetry and habitat study	<ul style="list-style-type: none"> • Data collection is completed • Compile and analyze collected data • Provide interim report • Provide final report • Incorporate information into PVA model • Apply model and information to other Snake Valley sites
Maintaining a monitoring well network in Snake Valley	<ul style="list-style-type: none"> • Ensure monitoring wells are maintained • Gather data from wells on a quarterly basis • Annual assessment and report provided to the team
Development and implementation of Nonnative Fish Management Plans	<ul style="list-style-type: none"> • Develop a Plan for Mills and Mona • Continue implementation of the Plan at Clear Lake • Finalize and implement the Mills and Mona Plans • Provide annual reports and status updates • Use adaptive management to modify Plans, as needed
Population monitoring	<ul style="list-style-type: none"> • Continue annual monitoring of natural and introduced populations • Complete the PVA model • Include new population monitoring data into the PVA model to track occupancy rates and extinction rates for the populations
Create and manage introduced populations	<ul style="list-style-type: none"> • Monitor introduced sites, document recruitment, restore habitat at sites, if needed. • Prepare additional sites for introductions, if more sites are needed to

	<p>meet the genetic goals.</p> <ul style="list-style-type: none"> • Ensure no nonnative fishes are present, and water source is secure.
Conservation team meeting and Annual status report	<ul style="list-style-type: none"> • Annual meetings • Annual submission of reports • Discuss changes to projects or plans in the coming year

4. Quantifiable, Scientifically Valid Parameters

We determined whether quantifiable, scientifically valid parameters that demonstrate achievement of objectives and standards by which progress will be measured, are identified. Demonstrated achievement with past conservation actions is based on least chub population response to restored and protected habitat. For example, springhead restoration, by manual removal of sediment and vegetation, has proven to be a cost-efficient and effective way to improve least chub habitat and increase least chub occupation of springheads at Gandy Marsh. Of the 21 springheads restored between 2006 and 2011, 14 have been re-colonized by least chub; and many of the sites were occupied within days post-restoration (Wheeler, 2011). By monitoring and prioritizing sites on a regular basis, relatively simple activities, such as the removal of sediment and encroaching vegetation from springheads, can occur as needed. Population assessment monitoring for least chub also occurred under the previous CCA. Habitat condition and adult and juvenile abundance (breeding success) and distribution within the spring complexes are monitored on a regular basis. This monitoring program was committed to through the original CCA and the 2014 CCA Amendment, and it will continue in future years and be expanded as necessary to assess the additional habitat protections and restoration. Thus, the monitoring program and the PVA model should continue to adequately capture population related responses to newly restored habitat, protection of habitat from heavy grazing levels, the removal of nonnative fishes, and the creation and maintenance of introduced population sites. Therefore, we have a high degree of certainty that there are quantifiable, scientifically valid parameters identified that will help demonstrate achievement of the objectives in the 2014 CCA Amendment.

5. Provisions for Monitoring

We determined whether provisions for monitoring and reporting progress on implementation (based on compliance with the implementation schedule) and effectiveness (based on evaluation of quantifiable parameters) of the conservation effort were provided. Population assessment monitoring for least chub has been ongoing under the previous CCA since at least 1998. Habitat condition and adult and juvenile abundance (breeding success) and distribution within the spring complexes are monitored on a regular basis. This monitoring program, has been committed to through the 2014 CCA Amendment, will continue in future years and be expanded as necessary to assess the additional habitat protections and restoration. The conservation committee will meet at least once annually to review the status of the least chub, develop yearly conservation action schedules, review the conservation strategy, and modify the strategy as appropriate. Based on past monitoring commitments since 1998, we have a high certainty that the provisions for monitoring are adequate and that this monitoring will continue to be implemented under the 2014 CCA Amendment.

6. Adaptive Management

We evaluated whether principles of adaptive management were incorporated into the 2014 CCA Amendment. Operating under an adaptive management framework is essential for success of least chub conservation. Adaptive management is a decision process that promotes flexible decision making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood. Grazing activities, nonnative fishes, groundwater withdrawal, weather conditions, and other factors are dynamic and interacting forces that continually affect least chub and their habitat. Because of uncertainties associated with future conditions, or the effectiveness of conservation actions, conservation strategies need to be adaptable to address habitat changes and emerging threats and to take advantage of new information based on research findings and the results of prior conservation efforts. Successful conservation requires flexibility to adapt strategies based on lessons learned and to accommodate habitat shifts associated with this changing environment. Whether responding to the dynamics of the spring system it occupies, or based on population responses to conservation actions, adaptive management as it pertains to least chub conservation is an ongoing activity at many levels. For example, springhead restoration by manual removal of sediment and vegetation has proven to be a cost-efficient and effective way to improve least chub habitat and increase least chub occupation of springheads at Gandy Marsh (see criterion 4, above, for additional details).

The dynamic nature of spring habitats require routine monitoring and adjustments to conservation actions to ensure the habitat is protected as grazing regimes shift, groundwater levels change or nonnative fishes, such as mosquitofish, are discovered in least chub habitats. Information gained from monitoring and research efforts will be reviewed by the conservation team on an annual basis and conservation planning and actions will be adjusted accordingly. Because of uncertainties associated with future environmental conditions, conservation strategies need to be adaptable to address habitat changes and emerging threats and to take advantage of new information based on research findings and the results of prior conservation efforts. Therefore, the CCA signatories have agreed to use the decision model being developed under the Population Viability Analysis to assess how variations in grazing management will help to reduce impacts to least chub. We will use the information to determine if grazing regimes need increased rest periods or if turn out dates need to be modified. Furthermore, initial studies on nonnative removal efforts suggest that modifications of protocols will yield better results, for example, waiting until carp congregate in the winter allows them to be more easily removed than in the summer, when removal efforts usually commence. Flexible decision making is essential for least chub conservation to be successful and is included in the actions committed to by the 2014 CCA Agreement signatories.

We have concluded that principles of adaptive management are incorporated into the conservation actions and the 2014 CCA Amendment. We also conclude that there is a high certainty that adaptive management principles will be applied because the conservation team has successfully implemented adaptive management since 1998.

Summary of Analysis for the Conservation Efforts

Using the criteria in PECE (68 FR 15115, March 28, 2003), we evaluated the certainty of implementation and effectiveness of the least chub 2014 CCA Amendment. We have

determined that the conservation efforts have a high certainty of being implemented. Our reasons for concluding that our level of certainty is high are because the mechanism and authorities for contributing funds are in place, the process for allocating funds to support maintenance and research is in place, the monitoring and documentation of compliance with the conservation actions are in place, annual reports have historically been completed on an annual basis, and all parties have the legal authorities to carry out their responsibilities under the 2014 CCA Agreement. We have determined that the conservation efforts are effective at eliminating or reducing threats to the species because they directly remove or modify grazing regimes, restore habitat, reduce fragmentation (by restoring corridors in the springhead complexes), maintain introduced populations, monitor groundwater, create and maintain introduced populations, and remove nonnative fishes.

We are confident that the conservation efforts will continue to be implemented because we have a documented track record of compliance by CCA signatories to date. In the 16 years of CCA implementation, there were no reported incidences of non-compliance with conservation actions. Conservation actions, such as fencing and restoration of Twin Springs at Bishop, nonnative fish management plans, restoration via a schedule and prioritization list, and implementation of the PVA and SDM models, are placed on an implementation schedule and will be effective upon completion. The actions have sufficient annual monitoring and reporting requirements to ensure that all of the conservation actions are implemented as planned, and are effective at removing threats to the least chub and its habitat. The collaboration among the parties signatory to the CCA requires regular conservation team meetings and involvement of all parties in order to implement the agreement fully. We find that the conservation efforts in the 2014 CCA Amendment have a high level of certainty of implementation (for those actions not already implemented) and effectiveness and can be considered as part of the basis for our final listing determination for the least chub.

Conclusion

Using the criteria specified in PECE (68 FR 15100, March 28, 2003), we have evaluated the certainty of future implementation and certainty of effectiveness of the 2014 CCA Amendment that is being implemented by us, BLM, UDWR, BOR, CUCWD, URMCC, and SNWA. Based on our evaluation, we have determined that all of the PECE criteria are satisfied and we have a high level of certainty that the conservation actions will be effectively implemented in the future, and over the long-term. As such, we find that the 2014 CCA Amendment has a high level of certainty of future implementation and certainty of effectiveness, and can be considered as part of the basis for our final listing determination for the least chub.

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Appendix 1. Implemented and completed conservation actions to address threats to the least chub as identified in the 1998 and revised in the 2005 CCA. Compiled from CCA assessment reports (Bailey 2006, entire; Hines et al. 2008, entire; Jones and Mellon 2009, entire).

Action Category	Implemented and Completed Actions
Determine baseline population, life history, and habitat requirements	<ol style="list-style-type: none"> 1. Discovered Mills Valley population in 1998. 2. In 2000, a study was funded to assess the ecological integrity and condition of Utah’s desert wetlands, several west desert sites showed that they were minimally impacted and were classified as reference sites (Keleher and Rader 2008). 3. In 2003, discovered the Clear Lake WMA population from thorough surveys, habitat evaluations, and aerial videography. 4. Additional life history information determined through research, including mosquitofish studies, and structural biodiversity of the wild sites. 5. In 2004, the process to evaluate range expansion sites was completed. 6. In 2004, an evaluation of monitoring methods resulted in new sampling protocols. 7. 2004-2006, BIO-West conducted ecological evaluations of aquatic ecosystems within Snake Valley, including least chub habitats (submitted to SNWA). 8. Coordination with UGS to install and monitor a series of deep groundwater monitoring wells and flow gauges at springheads within Snake Valley wetlands. 9. Installed and coordinated with UGS to monitor shallow wetland piezometers throughout least chub sites in Snake Valley to establish seasonal and interannual wetland trends. 10. 2010, conducted baseline physical habitat conditions study of wetlands in Snake Valley with corresponding LIDAR data (3PPI; 2010)
Genetic integrity	<ol style="list-style-type: none"> 11. 2005, determined the genetic structure of 6 wild and 2 refuge populations 12. Revised the Hatchery Production Plan for genetic backup through 2035. 13. Evaluated genetic divergence in refuge populations: The results indicated that the translocation programs, using large numbers of individuals to establish refuge populations, have been successful in maintaining the genetic identity of the source populations.
Habitat enhancement, (including restoration, land acquisition, grazing removal and exclosures)	<ol style="list-style-type: none"> 14. From 1998 to 1999 UDWR and URMCC acquired the Mona Springs Complex to protect least chub, Columbia spotted frog, and California floater. 15. In 2000, UDWR enhanced habitat at Mona and in 2005, removed grazing from the site. 16. Habitat enhancement at Mona from 2011-2013 deepened spring systems and removed Russian olive and other nonnative vegetation. 17. Russian olive and tamarisk removal at Leland Harris, Miller Springs, and Bishop. 18. Restoration: Springhead restoration, by means of manually removing sediment and vegetation, has proven to be a cost-efficient and effective way to improve least chub habitat and improve the population at Gandy Marsh. Led to successful reestablishment of least chub in newly restored springheads. 19. UDWR purchased water rights for beneficial instream use at Foote Reservoir, USFWS drafted a CCAA with the landowner for these water rights 20. From 1998-current, livestock grazing impacts at Miller Springs and the surrounding wetlands (approximately 50 acres) are reduced through a grazing management plan, wetland enhancement project and exclosures around multiple springheads. 21. In 2005, Pilot Springs, a reintroduction site, was fenced 22. In 2012, 28 acres around Foote Spring cleared of Russian olive. Led to documented increase in flow to Bishop Springs wetland. 23. Mechanical removal of purple loosestrife from Gandy Marsh between 2011-2013 24. In 2011, drilled well at Clear Lake to study feasibility of pumping to increase habitat (although it was determined that groundwater was too deep to effectively pump).

	<p>25. In 2014, the SITLA property at Leland was part of a landswap with UDWR, transferring ownership and management of the parcel to UDWR.</p>
Nonnative control	<p>26. In 1999, prior to nonnative fish removal at Mona, a wooden drop structure was constructed to prevent re-invasion of nonnative fishes after the project.</p> <p>27. In 1999, rainbow trout were removed from Miller Spring.</p> <p>28. In 2000 and 2011-2013, Funded by the BOR, UDWR conducted a nonnative fish removal project at the Mona spring complex.</p> <p>29. In 2001, a study was funded to evaluate interactions between mosquitofish and least chub, as well as examine least chub growth rates using otoliths.</p> <p>30. In 2002, the MOU between the Division and the Mosquito Abatement District was finalized to reduce the spread of mosquitofish in Utah.</p> <p>31. From 1999-ongoing, UDWR follows the Policy for Fish Stocking and Transfer Procedures, includes specific protocols for the introduction of nonnative species into Utah waters.</p> <p>32. From 2000-ongoing, mechanical removal of nonnatives from Mona.</p> <p>33. In 2003 and 2004, Red Knolls Pond and Pilot spring were chemically treated to prepare them as introduction sites.</p> <p>34. The Clear Lake Aquatic Control Plan written and implemented; between 2003 and 2013, over 1,600 adult (and over 1,600 young-of-year) common carp removed from Clear Lake.</p> <p>35. In 2008, chemical treatment conducted to remove nonnative carp and bass from Foote Spring in Bishop Springs wetland.</p>
Reintroduction	<p>36. In 2006, the LCCT drafted reintroduction and transplant protocols to establish genetic backup/refuge sites for each wild population to protect them from extinction due to demographic and environmental stochasticity or random catastrophes.</p> <p>37. By 2013, 26 introduction and experimental sites had been established.</p> <p>38. The Mona Springs population augmented from the hatchery population.</p>
Monitoring	<p>39. Least chub populations have been monitored annually since 1994, producing presence/absence and some juvenile recruitment data.</p>

Appendix 2. Conservation actions in the least chub 2014 CCA Amendment.

Threat	Planned Conservation Action	Anticipated Completion Date
Livestock grazing	UDWR agrees to complete the purchase of grazing rights for Mills Valley to remove current grazing activities on the 80 acre UDWR-owned parcel by September 2015. If future land use by UDWR includes grazing activities, it will be adaptively managed for the protection of least chub.	September 2015
	UDWR and BLM agree to ensure fencing on their respective lands is functioning properly and in good working order and also agree to allow UGS access to monitoring wells and piezometers on an annual recurring basis.	Annually
	UDWR agrees to encourage private landowners at Mills Valley, Leland, Gandy and Bishop to enroll in the Programmatic Candidate Conservation Agreement with Assurances (CCAA). Through enrollment, UDWR and USFWS would incorporate applicable conservation strategies which may include, but are not limited to, a grazing management plan that outlines a rotational grazing schedule, establishes a maximum number of grazing units, key rest periods, livestock turn-out dates and a monitoring and evaluation plan.	Following completion of the CCAA
	UDWR will finalize a land-swap package that includes the 739 acre SITLA property at Leland Harris, and ensure once acquired, the property will be managed by UDWR to benefit least chub.	1 year post signature of CCA
	BLM agrees to continue implementation of the Utah Guidelines for Grazing Management (BLM 2011) for the Partoun Grazing Allotment (which is 9 ac of the Leland site) when issuing grazing operator permits. This will ensure that a rotational grazing schedule is implemented, active grazing dates to minimize impacts to least chub and its habitat are set, and establish a maximum number of grazing units. BLM will monitor operators to ensure the guidelines are met on an annual basis and before issuing or renewing grazing permits.	Continuous
	BLM agrees to continue to implement the Gandy Allotment Grazing Management Plan when issuing or renewing grazing permits within the Gandy Allotment at Gandy Marsh and Bishop Springs population sites.	Continuous
	BLM agrees to continue to manage the Area of Critical Environmental Concern (ACEC) at Gandy for least chub and other priority values.	Continuous
	UDWR agrees to purchase the privately owned parcel at the Gandy site if the landowner remains a willing seller, and funds are available for the purchase. Upon purchase of the privately owned parcel, UDWR agrees to adaptively manage grazing or remove grazing completely for the protection of least chub following the land purchase. If land purchase is not feasible, other methods, such as a landswap with BLM or conservation easements could be pursued to minimize livestock grazing activities to levels suitable for least chub.	Anytime, if available for purchase
	BLM agrees to complete the fencing, watering access project and nonnative vegetation removal at South Twin Spring no later than 1 year following the signature of this agreement.	1 year after signature of CCA
	UDWR will continue to enhance habitat of degraded areas due to current or historical ungulate damage (or vegetation overgrowth in exclosures) within the least chub population sites through restoration activities, including, but not limited to the dredging of springheads on an annual reoccurring basis, by targeting a minimum of one location annually, through a prioritization list and schedule. Introduced population sites will be monitored for grazing related impacts and enhanced/restored on an as needed basis.	Annually
	UDWR agrees to submit an annual report to the conservation team documenting activities implemented and status of all least chub habitats.	Annually
	The conservation team will adaptively manage grazing at the wild sites (and applicable introduced sites) based on monitoring results of the current management	As needed

	actions, and modify actions as necessary to minimize grazing impacts at wild and applicable introduced sites. The conservation team will also use the decision model as guidance for grazing management and implement the grazing recommendations based on the model, where authority exists and as deemed necessary.	
Ground-water withdrawal & inadequacy of existing mechanisms to regulate ground-water withdrawal	UDWR agrees to continue to monitor least chub populations and incorporate recommendations from the OSU model for Snake Valley sites on an annual basis (or at a frequency determined by the Conservation Team); these data will also be used to evaluate the effect of groundwater withdrawal on least chub populations if the Snake Valley groundwater is developed beyond current levels.	Annually
	USFWS, UDWR and BLM agree to protest new water rights application through the formal protest process with the Utah State Engineer if the applications for water infringe on USFWS, UDWR, and BLM owned water rights and lands with least chub.	Continuous
	UDWR agrees to continue annual monitoring of water levels for all introduced sites and provide regular maintenance of water sources (e.g. pipes) at applicable introduced sites that both those that meet the refuge establishment criteria and those that are considered experimental populations.	Annually
	UDWR agrees to coordinate with Utah Geological Survey and U.S. Geological Survey to assess current piezometer data and monitor groundwater levels at Snake Valley least chub population sites. UDWR will also coordinate with these agencies to install additional piezometers, as needed.	Annually
	The conservation team will review the <i>Groundwater Conditions in Utah Report</i> produced annually by U.S. Geological Survey and the <i>West Desert Monitoring Report</i> to be produced annually by UGS beginning in 2014, to understand the current status of groundwater in the basins in which least chub populations occur (USGS report information for those sites outside of the Snake Valley).	Annually
	The conservation team will evaluate the decision model being developed by OSU to assess the continued stability and suitability of habitats to support least chub and assess the potential risks, such as extinction due to fragmentation and isolation.	Annually
	The conservation team will develop a means to integrate new and existing monitoring data into the decision model being developed to reduce key uncertainties and improve future decision-making. A summary report of the actions will be provided and reviewed on an annual basis.	1 year after completion of PVA
	UDWR in cooperation of the conservation team (and assistance of the Utah Geological Survey, if available) will use the in-depth habitat and bathymetry evaluation of the Leland Harris study in the development of a model that shows how water level at the least chub Snake Valley sites change in relation to the piezometer readings to establish a relationship between surface water level and wetland inundation.	After completion of bathymetry study
	UDWR agrees to use the in-depth habitat and bathymetry evaluation of Leland Harris wild population site as a representative study to further understand and identify important least chub habitat use. The success of the pilot study at Leland Harris will determine its utility in applying similar methodology to other least chub wild sites; or, whether information from the Leland Harris study can be extrapolated or applied to other sites. The Leland study report will be made available to the conservation team by September 2015.	After completion of bathymetry study
	The Southern Nevada Water Authority agrees to consider possible impacts of SNWA activities and plans on least chub and their habitat, and avoid and/or mitigate such impacts within the constraints of SNWA policy and authority.	When applicable
Nonnative fishes	Nonnative fishes are known to occur at three of the wild least chub sites, therefore UDWR agrees to continue to implement the Clear Lake WMA site-specific Nonnative Management Plan and develop and implement a Mills Valley and Mona Nonnative Management Plan until the threats associated with the nonnative species are minimized at all sites. UDWR agrees to implement the management plans as needed at each site.	Annually
	The Mona and Mills Valley plans will be drafted within 1 year following signature of	1 year after

	the agreement. If it is determined that these sites can no longer be managed for least chub due to the presence of nonnative fishes, the conservation team will use an adaptive management process to decide the future use of these sites and whether additional introduced sites are needed to offset the loss.	signature of CCA
	UDWR agrees to provide documentation on current nonnative removal efforts and the effectiveness of their efforts, as shown by least chub response, in order for the conservation team to evaluate and adaptively manage for nonnative fish species.	Annually
	UDWR agrees to maintain and enforce current UDWR code regulations that prohibit the collection, possession, transportation, and importation of nonnative fish species in order to limit stocking of species that could have a potentially negative impact to least chub.	Continuous
	UDWR agrees to distribute educational information on least chub and the negative impacts of introducing nonnative fishes to areas containing sensitive species to help limit the introduction of exotic fishes to least chub habitats.	Continuous
	The recommendations and restrictions identified through the above conservation actions will be used in adaptive management planning to accommodate changes necessary to improve the effectiveness of nonnative fish removal activities within occupied habitat. The conservation team will review these actions on an annual basis for their implementation and effectiveness.	As needed
Climate change and drought	The UDWR agrees to coordinate with Utah Geological Survey and United States Geological Survey to monitor piezometers and surface flow gages at the Snake Valley wild population sites in order to evaluate the changes in groundwater levels and spring discharge rates, respectively, and to correlate weather patterns with groundwater and surface water elevations to least chub distribution and abundance when datasets are robust enough to provide these correlations. Understanding the effects of weather patterns on least chub populations and habitat will help us develop adaptive management strategies by identifying important habitat use areas and limitations during particularly dry or warm years.	Annually
	UDWR agrees to use the in-depth habitat and bathymetry evaluation of Leland Harris wild population site as a representative study to further understand and identify important least chub habitat use areas during particularly dry or warm years. The success of the pilot study at Leland Harris will determine its utility in applying the same methodology to other least chub wild sites. The Leland study report will be made available to the conservation team by September 2015.	1 year after completion of bathymetry study
	The conservation team will receive the Population Viability Analysis and Decision Support Tool Model developed by Oregon State University to guide our past, present and future assessment of population demographics. This model coupled with the in-depth bathymetry study at Leland Harris (conducted by UDWR) will guide our management of the species under changes in drought and climate change conditions by providing the relationship of water body dimensions to seasonal precipitation, temperature, and ground and surface water levels.	1 year after completion of PVA
	The conservation team will analyze current information (and data provided through the bathymetry study at Leland) to better understand seasonal spring habitat and hydrological connectivity within population sites as they relate to least chub occupation and habitat use over time. Knowledge of seasonal and annual changes in habitat size and connectivity will be used in adaptive management planning to locate areas with limited connectivity due to prolonged drought or climate change and these areas will be prioritized for restoration or habitat modification, so that habitat corridors remain open for least chub.	September 2015
	The USFWS will evaluate current and newly established introduced populations for conservation value and UDWR agrees to continue establishing new refuge populations that meet conservation criteria until the stated refuge population goals have been met, to the extent that introduced populations can offset effects of climate change and/or extreme drought at the wild population sites.	Continuous
	Russian olive removal was successful at Foote Reservoir (Bishop Springs), where	As needed

	UGS was able to measure an increase in discharge from the spring due to a decrease in evapotranspiration from the nonnative vegetation. BLM and UDWR agree to additional Russian olive removal at Twin Springs (Bishop) within 1 year after signature of the agreement.	
Cumulative effects of climate change, ground-water withdrawal & drought	Addressing the threats listed above independently will prevent these threats from acting cumulatively.	Not applicable