# Little Colorado spinedace
## *(Lepidomeda vittata)*

## 5-Year Review:
## Summary and Evaluation

*Photo by U.S. Fish and Wildlife Service*

**U.S. Fish and Wildlife Service**
**Arizona Ecological Services Office**
**Phoenix, Arizona**

**5-Year Review: Summary and Evaluation**
**Short Template**

**Little Colorado spinedace (*Lepidomeda vittata*)**
**Current Classification:** Threatened

**U.S. Fish and Wildlife Service**
**Arizona Ecological Services Office**
**Phoenix, Arizona**

## 1.0 GENERAL INFORMATION

### 1.1 Reviewers:

**Lead Field Office:** Arizona Ecological Services Office (AESO)
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**Cooperating Field Office:** Arizona Fish and Wildlife Conservation Office (AZFWCO)
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**Cooperating Agency:** Arizona Game and Fish Department (AGFD)
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### 1.2 Purpose of 5-Year Reviews:

The U.S. Fish and Wildlife Service (Service or USFWS) is required by section 4(c)(2) of the Endangered Species Act (Act) to conduct a status review of each listed species once every 5 years. The purpose of a 5-year review is to evaluate whether or not the species' status has changed since the Fish and Wildlife Service listed it (or since the most recent 5-year review). Based on the 5-year review, we recommend whether the species should be removed from the list of endangered and threatened species, be changed in status from endangered to threatened, or be changed in status from threatened to endangered. We based the original listing as endangered or threatened on the species' status considering the five threat factors described in section 4(a)(1) of the Act. These same five factors are considered in any subsequent reclassification or delisting decisions. In the 5-year review, we consider the best available scientific and commercial data on the species, and focus on new information available since we last listed or reviewed the species. If

we recommend a change in listing status based on the results of the 5-year review, we must propose to do so through a separate rule-making process including public review and comment.

### 1.3 Methodology used to complete the review:

We conducted the review of the science assessing the status of the Little Colorado spinedace *(Lepidomeda vittata*) subsequent to the 5-year review published on October 10, 2008 (USFWS 2008). A complete list of listing and recovery-related documents pertaining to the Little Colorado spinedace is located at our Little Colorado Spinedace Environmental Conservation Online System (ECOS) webpage.

Since the publication of the previous 5-year review, we conducted a review of past and recent literature, public comments, the listing rule, and the recovery plan. The Arizona Game and Fish Department (AGFD) submitted information regarding Little Colorado spinedace surveys and management in a letter dated July 11, 2014 (AGFD 2014), and Mr. James W. Crosswhite, submitted a letter dated June 15, 2014 (Crosswhite 2014), describing management he conducted on his private property to promote spinedace habitat.

We sent draft versions of this document to AGFD and AZFWCO to review and provide feedback. We incorporated their comments as appropriate, and the Acting AESO Field Supervisor reviewed and finalized the document.

### 1.4 FR Notice citation announcing initiation of this review:

We provided notice of this status review on May 14, 2014, via the Federal Register (79 FR 27632), requesting information on the status of the Little Colorado spinedace. We received two comment letters referencing information regarding the species (see section 1.3 above). We provided notice again in the Federal Register (83 FR 25034) on May 31, 2018.

## 2.0 REVIEW ANALYSIS

### 2.1 Application of the 1996 Distinct Population Segment (DPS) Policy:

This section is not applicable to the Little Colorado spinedace. We did not list the species as a DPS.

### 2.2 Review Summary

#### 2.2.1 Most recent status review available:

The most recent status review for the Little Colorado spinedace is the 2008 5-year review (USFWS 2008). In the 2008 review, we recommended changing the

listing classification of the Little Colorado spinedace from threatened to endangered under the Endangered Species Act. We made this recommendation based on our inability to identify a means to address the current and future loss of water to spinedace habitats and the increasing dominance of non-native species. Although these threats are still very real to the long-term persistence of the spinedace, we also acknowledge the following:

- The spinedace has a final, approved recovery plan (USFWS 1998), but it does not contain objective, measurable recovery criteria for when the species could be considered for delisting. In addition, the recovery criteria do not address the five listing factors that are relevant to the species. As part of a national review of recovery criteria conducted in 2017, the Service identified the Little Colorado Spinedace Recovery Plan as a plan in need of measurable recovery criteria. Therefore, AESO and our partners will work during 2018 to develop recovery criteria for the Little Colorado spinedace. The revised recovery criteria are due December 29, 2018. The development of measurable and objective criteria will allow us and our partners to better understand the current and foreseeable status of the Little Colorado spinedace.

- Although the long-term predictions for surface water in the Little Colorado River are, as stated in our 2008 5-year review, likely to be negatively impacted by extended drought and climate change, we have not observed the persistent loss of surface water, particularly within the East Clear Creek watershed, that we anticipated in 2008. Water levels have fluctuated and we are currently in the midst of an extreme drought, but spinedace habitats are persisting and continue to support robust numbers and age classes of spinedace. We assume that the future outcome may still be as we predicted in 2008; however, we think that in the relatively near future (10 years from now), most perennial waters within the occupied spinedace habitat in the East Clear Creek watershed will continue to persist.

- Although we were unable to remove non-native fishes from CC Cragin Reservoir, we have not yet seen the upward migration of these fish into tributaries that support Little Colorado spinedace.

- Perhaps one of the most significant actions since 2008 is establishment of spinedace in several new locations (Willow, Barbershop and Kehl Canyons). These new areas have expanded the amount and extent of habitat occupied by spinedace. Although we (USFWS and our partners) have much work to do to secure these sites and expand spinedace occupancy into additional areas, we are making progress that did not seem possible in 2008.

- A key statutory difference between a threatened and endangered species is the timing of when a species may be in danger of extinction (i.e., currently on the brink of extinction), either now (endangered) or in the foreseeable future (threatened) (USFWS 2010). As stated above, in our 2008, 5-year review, we recommended a change in classification for the Little Colorado spinedace from "threatened" to "endangered." We based this recommendation on predicted future conditions that indicated the spinedace may be on the brink of extinction. However, that analysis addressed future condition, not the current condition. Since 2008, some of these predicted stressors either did not happen (e.g., green sunfish did not invade the tributaries of the East Clear Creek watershed) or were not as extreme as we anticipated (e.g., loss of perennial water). Today, it is clear that the stressors identified in our last 5-year review are factors threatening the spinedace with extinction in the foreseeable future, not now. Therefore, at this time, since the present condition of numbers and locations of fish is relatively stable, the Little Colorado spinedace is not on the brink of extinction, and is appropriately classified under the Act as threatened.

### 2.2.2 New information since previous status review:

#### 2.2.2.1 Accomplishment of recovery criteria:

As stated above, recovery criteria for the Little Colorado spinedace are not measurable and we have initiated a process to develop objective and measurable criteria and to define what constitutes a "population." We will complete this process by December 29, 2018. However, the existing Little Colorado Spinedace Recovery Plan lists four goals that we have used to provide a benchmark for measuring progress towards recovery. Goals of the existing Recovery Plan are to: 1) protect existing spinedace populations, 2) restore depleted and extirpated spinedace populations, 3) protect and enhance existing habitats, and 4) ensure that spinedace continue to exist into the future. We (the Service and our partners) have made progress towards the four goals of the Recovery Plan. The USFWS and our partners continue to work towards these goals by implementing the following actions:

<u>Recovery Goals 1 and 3: Protect existing spinedace populations and protect and enhance existing habitats</u>

- The U.S. Forest Service (USFS) Coconino and Apache-Sitgreaves National Forests and USFWS have cooperatively developed and implemented forest management projects intended to reduce the risk of high severity fire in drainages with occupied and suitable Little Colorado spinedace habitat. Projects implemented include use of fire (naturally ignited and prescribed burns) to re-introduce fire to the East Clear Creek watershed, implementation of prescribed fire and/or mechanical thinning

of trees under the East Clear Creek Watershed Health Project, the Nutrioso Wildland Urban Interface (WUI) Fuels Reduction Project, the Larson Forest Restoration Project, the Rim Lakes Healthy Forest Restoration Act Project, and the Victorine WUI Project. In addition, we (Forest Service, USFWS, and many others) collaboratively developed the Cragin Watershed Restoration Project (decision to be signed in summer 2018) and are working towards development of the Rim Country Forest Restoration Project to reduce high-severity fire risk to spinedace habitat by reducing fuels (thinning trees) and conducting broadcast burns throughout the areas where the USFS did not yet have environmental assessments completed to conduct actions to improve forest and watershed condition in the East Clear Creek and Chevelon watersheds.

- The USFS Coconino National Forest has also closed roads in sensitive portions of the East Clear Creek watershed to improve habitat conditions under their travel management plan.

- In 2011, AGFD, USFWS, and USFS biologists collected Little Colorado spinedace from the following streams: Rudd Creek (n=175), Nutrioso Creek (n=32), Little Colorado River (LCR) Wenima (n=194), and LCR Becker (n=32), following the Wallow Fire in June 2011. These fish were placed in the AGFD's Grasslands Wildlife Area refuge pond. These fish survived and spawned within the pond for several years. Young-of-year fish were documented, but never seemed to survive, thus, the spinedace died out over time, likely of old age. A snorkel survey was conducted by AGFD on April 18, 2018, and detected no fish in the pond. The pond level was extremely low at the time of survey due to lack of water to fill the pond. Plans are being developed to drill a well to supplement the current water supply and to improve habitat within the pond to improve recruitment of young spinedace.

- In 2007, AGFD detected non-native green sunfish (*Lepomis cyanellus*) in CC Cragin Reservoir during fall electrofishing surveys. Green sunfish are a significant threat to spinedace through both predation and competition. In 2009, during electrofishing surveys, AGFD found green sunfish in CC Cragin Reservoir at the confluence with Bear Canyon, and in 2010, green sunfish were detected downstream of the reservoir. In 2011 and 2012, AGFD conducted surveys of the tributary streams to the reservoir (East Clear Creek, Miller Canyon, Houston Draw, General Springs, and Bear Canyon) to determine the extent of the green sunfish in the system. Surveyors did not detect sunfish in any of these tributary streams. However, they did locate green sunfish in the reservoir at the confluence with Bear Canyon and Houston Draw. We continue to be concerned about the threat this nonnative species poses to spinedace in the East Clear Creek watershed. However, because CC Cragin Reservoir is now the water source for the City of Payson, the frequency and duration of hydrological

connection between the reservoir and the upstream tributaries is reduced. It is now less likely that nonnative fish in the reservoir will have the opportunity to move upstream or downstream into critical habitat. As extended drought and long-term climate change increase water temperatures in East Clear Creek, we may see an expansion of green sunfish below the reservoir.

- The AGFD purchased the Nutrioso Creek portions of the EC Bar Ranch in December 2017 to protect Little Colorado spinedace and its habitat.

<u>Recovery Goals 2 and 4: Restore depleted and extirpated spinedace populations and ensure that spinedace continue to exist into the future.</u>

- The USFWS and AGFD collected Little Colorado spinedace from West Leonard Canyon in June 2011 (101 spinedace originally collected, 98 stocked out) and September 2013 (179 spinedace collected). These fish were cared for by USFWS staff at facilities leased at the Rocky Mountain Research Station greenhouse in Flagstaff, Arizona. On October 23, 2013, the USFWS and AGFD stocked 150 spinedace from the greenhouse facility into Willow Creek, a new site within the East Clear Creek watershed, located by AGFD staff. On August 12, 2015, we stocked the remaining 126 spinedace into Willow Creek. In total, AGFD and USFWS stocked 276 spinedace into Willow Creek on two different occasions. AGFD and FWS conducted surveys following these releases (July 16, 2015 and September 15, 2016) and have documented multiple size classes of spinedace and movement of fish downstream.

- Spinedace were stocked into Yeager Canyon in 2007 (n=80) and 2008 (n=167) with fish from West Leonard Canyon. Spinedace have persisted in Yeager Canyon and the site now serves as a donor site to collect spinedace for other translocations. In 2018, AGFD collected fish from Yeager Canyon to stock into Barbershop Canyon and Kehl Canyon (see below) and brought approximately 550 spinedace into captivity at the USFWS greenhouse facility in Flagstaff, Arizona. USFWS and AGFD will use these spinedace to supplement the spinedace in Willow Creek, and to begin establishing new spinedace locations in Gentry, and Turkey Creeks on the Apache-Sitgreaves National Forest in August/September 2018. Yeager Canyon serves as an alternative collection site to West Leonard Canyon, so the spinedace at the latter site will be less impacted by yearly removals for translocations.

- AGFD staff sampled Kehl Canyon and Miller Canyon in the East Clear Creek watershed in July-August 2009 to determine suitability for potential spinedace stocking. Fish biologists determined that both waters have sufficient habitat to support spinedace. AGFD's Conservation and Mitigation Program (CAMP) conducted a successful mechanical removal

campaign of rainbow trout from Kehl Canyon in 2015-2016 to make the stream suitable for native fish. AGFD stocked spinedace into Kehl Canyon in 2017 (n=377) and 2018 (n=176) from Yeager Canyon, with plans to augment the site as needed. AGFD plans to stock spinedace into Miller Canyon for the first time in fall 2018/Spring 2019 if source locations are robust enough.

- In April and May 2018, AGFD conducted a translocation of Little Colorado spinedace (n=1,010) from Yeager Canyon to Barbershop Canyon within the East Clear Creek watershed. The purpose of the translocation was to establish a new location of spinedace in Barbershop Canyon within their historic range. The stocking locations used were identified during reconnaissance, habitat, temperature and electrofishing surveys conducted by the AGFD Region 2 CAMP from 2014-2017.

**2.2.2.2 New information on the species' biology, life history, habitat, and ecosystem:**

There is no new information on biology, life history, habitat, or ecosystem of the Little Colorado spinedace.

**2.2.2.3 New information on trends in populations, demography, and spatial distribution:**

The AGFD consistently conducts surveys in known occupied and potential Little Colorado spinedace habitat. Within the East Clear Creek watershed on the Coconino National Forest, West Leonard Canyon continues to support all age classes of spinedace. The site also supports native suckers and speckled dace (*Rhinichthys osculus*), but spinedace are the most numerous fish in this area. Between July 2008 and June 2018, the relative numbers and density of spinedace within the West Leonard Canyon habitat continue to be robust.

In 2016, AGFD staff sampled Dane Canyon, Bear Canyon, Yeager Canyon, West Leonard Canyon and Dines Tank. Staff observed all age classes of spinedace in all of the streams sampled.

In 2009, AGFD staff conducted spinedace monitoring on Nutrioso Creek, Rudd Creek, Little Colorado River, Chevelon Creek, Silver Creek, Wenima Wildlife Area, and Grassland Wildlife Area. Spinedace were found in various sample reaches or locations at all the above sites, except Silver Creek. Little Colorado spinedace have not been detected in Silver Creek since 1997. In 2012, AGFD personnel conducted surveys and documented persistence of Little Colorado spinedace in Rudd Creek and Little Colorado River (LCR) following the 2011 Wallow Fire. Spinedace were common and well-distributed in their normal range within Rudd Creed, but were uncommon or not found in their normal range in the LCR. Other species reductions in the LCR indicate a partial fish kill occurred as a

result of post-fire effects. However, surveys of the Wenima Wildlife Area (WA) and Becker WA on the Little Colorado River in October 2015 found spinedace to be common. An average of 21 spinedace were found per 50 meter site on the Wenima WA but only present in low numbers (average 2 spinedace per 50 meter site) on the Becker WA. Two largemouth bass also collected in a beaver pond at one Becker WA site is a concern. The origin of these bass is unknown, but mechanical removals of illegally stocked largemouth bass in nearby Becker Lake have been conducted in 2016 and 2018 (efforts in 2017 were rained out) to reduce their presence in the area.

No spinedace were found in upper or lower Nutrioso Creek following the Wallow Fire in 2011. However, surveys conducted on the EC Bar Ranch property on October 31, 2014 found Little Colorado spinedace to be persisting in upper Nutrioso Creek. The AGFD purchased portions of this ranch that encompasses this habitat in upper Nutrioso Creek to protect the spinedace and its habitat.

The AGFD conducted surveys in West Chevelon Creek and Chevelon Creek (The Steps) on September 19, 2013 and November 8, 2013, respectively. Spinedace were found to be common in both streams. West Chevelon is a reintroduced location, stocked with spinedace collected from lower Chevelon Creek in July 2007.

Although we do not yet have an agreed upon definition for what constitutes a "population" of Little Colorado spinedace, the number of areas within the East Clear Creek watershed where spinedace are persisting, has increased since our last 5-year review. In addition, occupied sites in the LCR, West Chevelon Creek, Nutrioso Creek, and Rudd Creeks continue to support spinedace. Efforts by AGFD, USFWS, and the Forest Service have resulted in an increased number of habitats, albeit relatively small areas, which spinedace occupy.

**2.2.2.4 New information on genetics and taxonomic classification:**

There is no new information on genetics and taxonomic classification of the Little Colorado spinedace.

**2.2.2.5 New information about conservation measures:**

The following are updates on conservation measures implemented as part of biological opinions, habitat management actions, and funding opportunities:

- Through a Section 6 Endangered Species Act Grant, the AGFD acquired the EC Bar Ranch (~392 acres) on Nutrioso Creek, the accompanying 111.21 acre-feet surface water rights, and 45 acre-feet storage rights in the Nutrioso Reservoir of the EC Bar Ranch tract. The purpose of this purchase was to benefit the habitat of the Little Colorado spinedace and the New Mexico meadow jumping mouse (*Zapus hudsonius luteus*), both

of which are found on the property. Although there are non-native crayfish within Nutrioso Creek, this acquisition allows for protection of the water itself while we collectively work to find a removal solution for crayfish.

- The Bureau of Reclamation is planning to provide funding to aid the Forest Service as part of a request prepared by the USFWS and Forest Service to provide increased protection of headwater meadows in the East Clear Creek watershed, Coconino National Forest. When these wet meadows are in proper functioning condition, they provide significant water storage and delivery to downstream spinedace habitat. This funding will aid in construction and management of fencing to protect these sites from the negative effects of excessive wild ungulate and recreational use and assist in maintenance of perennial water within these drainages. Our intention is to work with the Bureau of Reclamation to acquire additional funding to conduct similar work on the Apache-Sitgreaves National Forest.

- If CC Cragin Reservoir, Knoll Lake, or Nelson Reservoir experiences a significant runoff event that results in significant flow of water during the rainbow trout stocking season, under the CAMP biological opinion, AGFD will conduct surveys during low flow periods following the spill event to detect stocked rainbow trout upstream and downstream of the affected reservoir(s). This action is important for monitoring the potential effect of stocked rainbow trout that may move outside of reservoirs and into spinedace habitat. Since 2008, CC Cragin Reservoir spilled in 2010, 2011 and 2013; and Knoll Lake spilled in 2010, 2011, 2013, 2015 and 2016. Stocked trout were captured below CC Cragin Reservoir in 2010 (n=1) and Knoll in 2013 (n=6) and 2016 (n=1). No fish were observed in the stomachs of any stocked trout captured. All trout captured below Knoll were within 100 meters (~330 feet) of the lake in isolated pools of the spillway.

- In September 2011, a pond liner was purchased and installed at Middle Wallace Tank at AGFD's Raymond Wildlife Area. Prior to installing the liner, this pond was drained and deepened to improve habitat in hopes of establishing a Little Colorado spinedace refuge site. Desert Fish Habitat Partnership funding ($16,000) was awarded to this project, with matching funds from AGFD ($6000 in Heritage IIAPM) and USFWS ($6000 in 1122 Account, Ecological Services). The pond filled with water and initially stocked with 100 spinedace in 2012 from the captive West Leonard Canyon stock in Flagstaff. Since that stocking, the pond has had problems with retaining a stable water level due to potential pond liner leaks and water pump failures. A monitoring survey in 2013 did not capture any spinedace. Due to water availability and liner issues, it is unlikely that this site will be used in the near future to hold Little Colorado

spinedace. Unfortunately, earthen and lined ponds, have not provided sufficient long-term habitat for spinedace and seem to be plagued by water quality, water quantity, and other management issues (e.g., Winslow High School Refuge Pond, Arboretum at Flagstaff Refuge Pond, and Raymond Wildlife Area Refuge Pond). It is the USFWS's opinion that though these types of habitats are useful for many species, they have not contributed significantly to spinedace conservation. We have found that wild "pool" sites have fared much better for spinedace and it is our recommendation that we focus on finding and using perennial pools within existing spinedace habitat to establish new spinedace locations.

### 2.2.3 Threats analysis:

The threats analyses of the first five-year review (USFWS 2008) is still relevant. The known locations of Little Colorado spinedace continue to be vulnerable to and threatened by natural events (e.g., habitat modification by native ungulates in headwater meadows and high-severity landscape scale wildfire), environmental conditions (e.g., drought, climate change), and species characteristics (e.g., vulnerability of individuals and sites to non-native predators).

### 2.2.4 Summary of status review:

The Little Colorado spinedace is a fish with a limited distribution and relatively low numbers, making it highly vulnerable to stressors, particularly drought, high-severity wildfires, and invasions of non-native fishes. However, accomplishments during the reporting period that contributed to recovery include the following:

- AGFD, USFWS, and partners stocked spinedace into new areas within their existing range, particularly within the East Clear Creek drainage. These sites have increased the number of locations within the watershed that currently support spinedace. Spinedace have persisted at these sites and multiple age classes have been detected.

- Multiple forest management projects designed to reduce high-severity fire risk and protect the watersheds that the Little Colorado spinedace occurs in are either under way or planned for implementation in the near future.

Collectively we have made or are in the process of making significant efforts to conserve Little Colorado spinedace. In particular, AGFD staff has expended countless hours to survey habitat, document locations, and work with us and other partners to identify additional habitats and refuges where spinedace could be maintained. All of these actions have benefited the species and contributed to increased security for the Little Colorado spinedace, particularly within the East Clear Creek watershed and surrounding areas.

Within the next few months we will work with all of our partners to define

objective and measurable recovery criteria for the Little Colorado spinedace that will significantly aid us in determining where the spinedace is on the path to recovery and what additional actions may be needed to ensure the survival and conservation of the fish into the future.

## 3.0 RESULTS

### 3.1 Recommended Classification:

____ Downlist to Threatened
____ Uplist to Endangered
____ Delist (*Indicate reasons for delisting per 50 CFR 424.11):*
____ *Extinction*
____ *Recovery*
____ *Original data for classification in error*
__X_ No change is needed

### 3.2 New Recovery Priority Number:

The current listing and reclassification priority number for Little Colorado spinedace is 2 (high degree of threat/high recovery potential). We do not recommend a change at this time.

## 4.0 RECOMMENDATIONS FOR FUTURE ACTIONS

We will work with our partners to implement the following recommended actions during the next five-year review period:

- Update and revise the Recovery Plan to include objective and measurable delisting criteria that address the five-listing factors as required by section 4(f)(1)(B)(ii) of the Act. This process should include the development of a definition for what constitutes a population. This action will be completed by December 29, 2018.

- Evaluate the work conducted in the East Clear Creek watershed, particularly the identification and stocking of suitable habitats and stressor (non-native fishes) removal to the Chevelon Creek, Nutrioso/Rudd Creek, and Little Colorado River drainages.

- Work with Federal and non-Federal entities to ensure that environmental flows are protected in future water development plans within the historical range of the spinedace. Efforts to work with the Coconino Plateau Water Advisory Council and the Bureau of Reclamation regarding future water use on the Coconino Plateau may assist with this effort. In addition, the USFWS should actively work with non-Federal water users to determine if Habitat Conservation Plans, Safe Harbor Agreements, or other cooperative conservation efforts may be options for maintaining instream flow.

- Evaluate the LCR watershed and identify portions of the watershed to be managed for native fish (including the spinedace), and actions required in these areas to support native species. Establishing new locations within perennial waters in the watershed not subject to drying due to extended drought or at risk of loss due to new surface or groundwater pumping would provide stability for the species over time.

- Continue to implement and support the East Clear Creek Watershed Recovery Strategy for the Little Colorado Spinedace and other Riparian Species. The actions implemented to date, particularly the supplemental stocking of spinedace and improved livestock management, have greatly assisted in sustaining spinedace within the East Clear Creek Watershed.

- Continue to take an active leadership role to work with other state and Federal partners to initiate a program of aggressive development of novel technologies to assist with the control of invasive non-native fishes and other aquatic organisms. The Little Colorado spinedace is one of many species currently threatened with extinction due to our inability to control non-native and invasive species, such as crayfish and green sunfish.

- Work with private land owners and Federal land-management agencies along Silver Creek to develop a comprehensive management plan for the watershed. Develop a plan for the watershed that addresses water quality, water quantity, and management of non-native species.

## 5.0 INFORMATION USED TO CONDUCT REVIEW

Arizona Game and Fish Department (AGFD). "Summary of Updates for Little Colorado Spinedace 5-year Review." Received by Steven L. Spangle, July 15, 2014.

Crosswhite, James W. "Response to request for comments on status of Little Colorado Spinedace." Received by Steven L. Spangle, June 15, 2014.

U.S. Fish and Wildlife Service (USFWS). 1998. Little Colorado River Spinedace, *Lepidomeda vittata*, Recovery Plan. Albuquerque, NM. 51 pp.

U.S. Fish and Wildlife Service. 2008. 5-Year Review: Summary and Evaluation. Little Colorado spinedace (*Lepidomeda vittata*). U.S. Fish and Wildlife Service. Arizona Ecological Services Field Office. Phoenix, Arizona. 30 pp.

U.S. Fish and Wildlife Service. 2010. Supplemental Explanation for the Legal Basis of the Department's May 15, 2008, Determination of Threatened Status for Polar Bears. December 22, 2010. 18 pp.

**(*Lepidomeda vittata*)**

**Current Classification:** Threatened

**Recommendation resulting from the 5-Year Review:**

____ Downlist to Threatened
____ Uplist to Endangered
____ Delist
_X__No change needed

**Appropriate Listing/Reclassification Priority Number, if applicable:** Not applicable

**Review Conducted By:** Shaula J. Hedwall, U.S. Fish and Wildlife Service, Arizona Ecological Services, Flagstaff, Arizona

**FIELD OFFICE APPROVAL:**

**Acting Field Supervisor, U.S. Fish and Wildlife Service, Arizona Ecological Services Office, Phoenix, Arizona**

Approve LAUREL BARNHILL Digitally signed by LAUREL BARNHILL Date: 2018.07.03 14:10:35 -07'00' Date _____