Yaqui catfish
(*Ictalurus pricei*)

Five-year Review:
Summary and Evaluation

U.S. Fish and Wildlife Service
San Bernardino National Wildlife Refuge
Douglas, Arizona

FIVE-YEAR REVIEW
Yaqui catfish (*Ictalurus pricei*)

1.0 GENERAL INFORMATION

1.1 Reviewers:

Lead Regional or Headquarters Office: Southwest Regional Office, Region 2
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Angela D. Anders, Ph.D., Branch Chief, Recovery and Restoration, Ecological Services (505) 248-7953
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Cooperating Field Office(s): Arizona Ecological Services Office, Tucson, AZ; (520) 670-6144

1.2 Methodology used to complete the review:

This review was an effort made by San Bernardino National Wildlife Refuge and the Division of Biological Sciences with cooperation from the Arizona Ecological Services Office. The Yaqui Fishes Recovery Plan (USFWS 1995) was used to describe the species' earlier status; annual monitoring data and literature review were used to make a classification recommendation.

1.3 Background:

1.3.1 FR Notice citation announcing initiation of this review:

73 FR 14995

1.3.2 Listing history

Original Listing
FR notice: 49 FR 34490
Date listed: 31 August 1984
Entity listed: species
Classification: threatened

1.3.3 Associated rulemakings:

Critical habitat was designated in 49 FR 34490 as all aquatic habitats on San Bernardino National Wildlife Refuge.

1.3.4 Review History:
This is the first five-year review for Yaqui catfish (*Ictalurus pricei*)
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1.3.5 Species' Recovery Priority Number at start of five-year review:
3C

1.3.6 Recovery Plan or Outline

Name of plan or outline: Fishes of the Rio Yaqui: Recovery plan.
Date issued: 29 March 1995
Dates of previous revisions, if applicable: N/A

2.0 REVIEW ANALYSIS

2.1 Application of the 1996 Distinct Population Segment (DPS) policy

2.1.1 Is the species under review a vertebrate?
__X__Yes, go to section 2.1.2.
_____No, go to section 2.2.

2.1.2 Is the species under review listed as a DPS?
____ **Yes**, go to section 2.1.3.
__**X**__ ***No****, go to section 2.1.4*

2.1.3 Was the DPS listed prior to 1996?
____ ***Yes****, give date and go to section 2.1.3.1.*
____ ***No****, go to section 2.1.4.*

2.1.3.1 Prior to this five-year review, was the DPS classification reviewed to ensure it meets the 1996 policy standards?
____ Yes, provide citation and go to section 2.1.4.
____ No, go to section 2.1.3.2.

2.1.3.2 Does the DPS listing meet the discreteness and significance elements of the 1996 DPS policy?
____ ***Yes****, discuss how it meets the DPS policy, and go to section 2.1.4.*
____ ***No****, discuss how it is not consistent with the DPS policy and consider the five-year review completed. Go to section 2.4., Synthesis.*

2.1.4 Is there relevant new information for this species regarding the application of the DPS policy?
_____ ***Yes***
__**X**__ ***No****, go to section 2.2., Recovery Criteria.*

2.2 Recovery Criteria

2.2.1 Does the species have a final, approved recovery plan?
__**X**__ ***Yes****, continue to section 2.2.1.1*

_____ ***No****, consider recommending development of a recovery plan or recovery criteria in section IV, Recommendations for Future Actions, and go to section 2.3., Updated Information and Current Species Status.*

2.2.1.1 Does the recovery plan contain objective, measurable criteria?
_____***Yes,*** *continue to section 2.2.2*
__**X**__***No,*** *consider recommending development of a recovery plan in section IV.*

2.2.2 Adequacy of recovery criteria.

2.2.2.1 Do the recovery criteria reflect the best available and most up-to date information on the biology of the species and its habitat?
__X__ Yes.
____ No, go to section 2.2.3, and note why these criteria do not reflect the best available information. Consider developing recommendations for revising recovery criteria in section 4.0.

2.2.2.2 Are all of the five listing factors that are relevant to the species addressed in the recovery criteria (and is there no new information to consider regarding existing or new threats)?
__***X***__ ***Yes****, go to section 2.2.3.*
____***No****, go to section 2.2.3, and note which factors do not have corresponding criteria.*

2.2.3 List the recovery criteria as they appear in the recovery plan, and discuss how each criterion has or has not been met, citing information:
Existing recovery plan criteria are subjective and leave numerous ambiguities including (for example) the lack of definition of "adequate perennial flows," or the lack of definition of "undesirable organisms." In addition, the general recovery criteria for all Rio Yaqui species, below, are not criteria inasmuch as they are conservation directives. These conditions and criteria were tentatively identified with the extremely limited information available at the time:

a) Secure and protect San Bernardino Valley aquifers so that all artesian well and other flows from subsurface sources are perennial. Secure and protect Leslie Creek, Black Draw, AZ, and Mimbres River, NM, watersheds to ensure adequate, perennial flow. And,
b) eradicate all non-indigenous fish species and other undesirable organisms such as bullfrogs from critical habitat. And,
c) protect critical habitat and other habitats where species of concern occur or are reestablished from human disturbances including excessive grazing, irrigated agriculture, mining, introductions of non-indigenous species, and water diversion or removal.

Overall, the general criteria have been met in part, at least in the United States (U.S.). Portions of the San Bernardino aquifer are protected by conservation easements and further easements are being pursued; the entire Leslie Creek drainage is protected by a conservation easement held by the US Fish and Wildlife Service; but little of the Mimbres Basin is protected. All non-indigenous fish species have been eradicated from critical habitat at San Bernardino NWR, but bullfrogs persist. Human disturbance is minimized in all critical habitat by restricted access to San Bernardino NWR, and there are no present or anticipated disturbances such as those listed in the criteria.

Recovery criteria specific to Yaqui catfish have not been met. The U.S. Yaqui catfish population has declined by 15% per year ($\Lambda = 0.85$) and extirpation is predicted in the U.S. by 2018 (Stewart et al. 2017). Moreover, the status of Yaqui catfish is suspected to be poor throughout the majority of its range in Mexico (Varela-Romero et al. 2011). Varela-Romero et al. (2011) identified that in Mexico this species is now rare, extirpated from much of its former range, hybridizing with non-native Ictalurid species (Varela-Romero et al. 2007), and that the Yaqui catfish should be considered endangered. Furthermore, the general degradation of aquatic habitats in Mexico continues (Miller et al. 2005) and likely presents an on-going threat to Yaqui catfish.

The shortcomings of the current, subjective criteria in conjunction with new research that helps improve recovery plans suggests that the current recovery criteria are inadequate. First, the recovery plan states that the "physical size [of San Bernardino and Leslie Canyon NWRs] can only act as a genetic and population refugium." Too, because about 98% of the geographic range of this fish exists in Mexico, a corresponding lack of information (e.g., demographic data), knowledge, and management jurisdiction leads us to determine that amending the current recovery plan with quantitative delisting criteria for the Yaqui catfish is not practicable. The current recovery plan states that down-listing will occur "when recovery in the form of protection of wild populations from threats of hybridization, negative interactions with non-indigenous species or other negative impacts is assured in both the U.S. and Mexico, where Mexican populations are therefore secure and self-sustaining." However, this criterion is not easily anticipated for this fish because it naturally occurs in a limited geographic range in the U.S., multiple threats to its survival have increased in Mexico, and there is an overall lack of historical range in which the species can be potentially recovered in Mexico.

If you answered *yes* to both 2.2.2.1. and 2.2.2.2., evaluating whether recovery and/or downlisting criteria have been met in section 2.2.3 may be sufficient to evaluate the species listing classification and no further analysis may be necessary; *go to section 2.4., Synthesis.*

If you answered *no* to either 2.2.2.1 or 2.2.2.2, *continue to section 2.3.*

2.3 Updated Information and Current Species Status

2.3.1 Biology and Habitat: (Background)

Yaqui catfish are bottom-dwelling omnivores representing the only know native Ictalurids west of the Continental Divide (Minckley 1973, USFWS 1995). Very little is known about the species' biology, but Minckley believed that it paralleled that of channel catfish (*Ictalurus punctatus*). Hendrickson et al. (1981) surveyed the Rio Yaqui and tributaries in the late 1970s and early 1980s, and found that Yaqui catfish were widespread through the main stem of the Rio Yaqui, but were absent from the far-eastern regions of the Rio Papagochic (where the species was historically collected).

2.3.1.1 New information on the species' biology and life history: Growth rates of Yaqui catfish (0.12 mm y^{-1}), as inferred by von Bertalanffy models and reported in Stewart et al. (2017), are within the range of growth estimates reported for congeners like channel catfish *Ictaluras punctatus* (0.06-0.26 mm y^{-1}), flathead catfish (*Pylodictis olivaris*; 0.06-0.20 mm y^{-1}), and blue catfish *Ictalurus furcatus* (0.04-0.21 mm y^{-1}) (Sakaris et al. 2006; Stewart et al. 2016; Stewart et al. 2017) (Figure 1), but lower than estimates reported for yellow bullhead (*Ameirurus natalis*; 0.42-0.84 mm y^{-1}) (Finnel et al. 1956; Wydoski and Whitney 1979; Murie et al. 2009). Yaqui catfish asymptotic lengths (519 mm) are similar to the asymptotic lengths reported for channel catfish (523-846 mm), smaller than most estimates reported for flathead catfish (1010-1230 mm) and blue catfish (512-1303 mm) (Sakaris et al. 2006; Carter-Lynn et al. 2015; Stewart et al. 2016), but larger than estimates reported for yellow bullhead (214-420 mm) (Finnell et al. 1956; Wydoski and Whitney 1979; Murie et al. 2009). Based on these comparisons with other Ictalurid species, growth of Yaqui catfish is most similar to growth estimates reported for channel catfish.

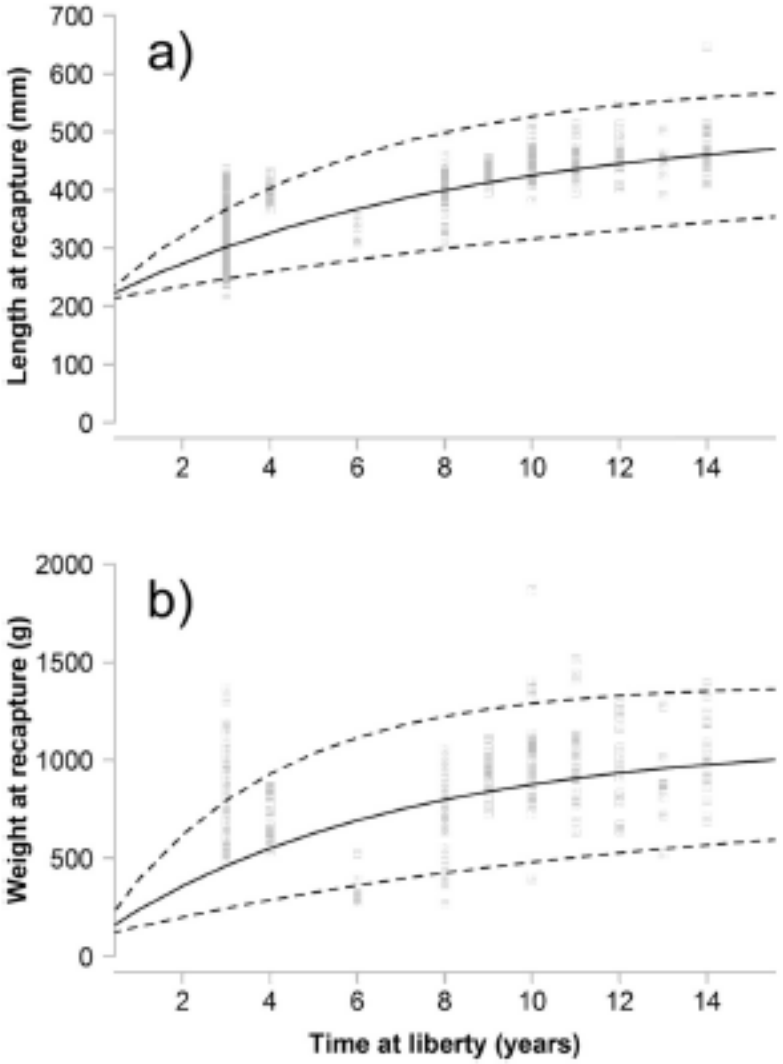

Figure 1. von Bertalanffy growth models for released Yaqui catfish *Ictalurus pricei*. Observed (gray boxes) and predicted recaptured lengths (a) and weights (b) over time (years; black lines indicate means with dashing the confidence limits).

2.3.1.2 Abundance, population trends (e.g. increasing, decreasing, stable), demographic features (e.g., age structure, sex ratio, family size, birth rate, age at mortality, mortality rate, etc.), or demographic trends: Yaqui catfish were probably extirpated from the U.S. before the 1960's, when flows in Black Draw ceased. Reestablishment efforts in the mid-1990s resulted in Yaqui catfish being stocked at Twin Pond at San Bernardino NWR (N = 160), House Pond at Slaughter Ranch (N = 200), and three ponds at El Coronado Ranch (N = 1464). These stocks arose from Yaqui catfish captured in the rios Aros and Bavispe, and the Cajon Bonito.

Yaqui catfish have not been captured in Twin Pond since 2005, despite extensive trapping efforts. Two of the three El Coronado Ranch populations were lost when the ponds unexpectedly dried. Populations continue to persist

at House Pond at Slaughter Ranch and Big Tank at El Coronado Ranch. However, as Stewart et al. (2017) demonstrate, Yaqui catfish in the U.S. have low reproductive potential in small spring-fed ponds (Figure 2). No young or smaller size (<300 mm) Yaqui catfish have been observed in surveys or even after fish salvaging events following draining of many ponds for maintenance from 2000 to 2015 (Figure 2). There have been two observations of small but dead Yaqui catfish found along the shoreline, but these observations remain unvalidated. Thus, if limited propagation occurred, young Yaqui catfish did not survive to adulthood. With recruitment essentially zero and annual survival high (>70-75%; Figure 3), the overall decline in Yaqui catfish equated to a 15% decrease in population size per year (Λ = 0.85), with extirpation predicted in the U.S. by 2018 (Figure 4; Stewart et al. 2017).

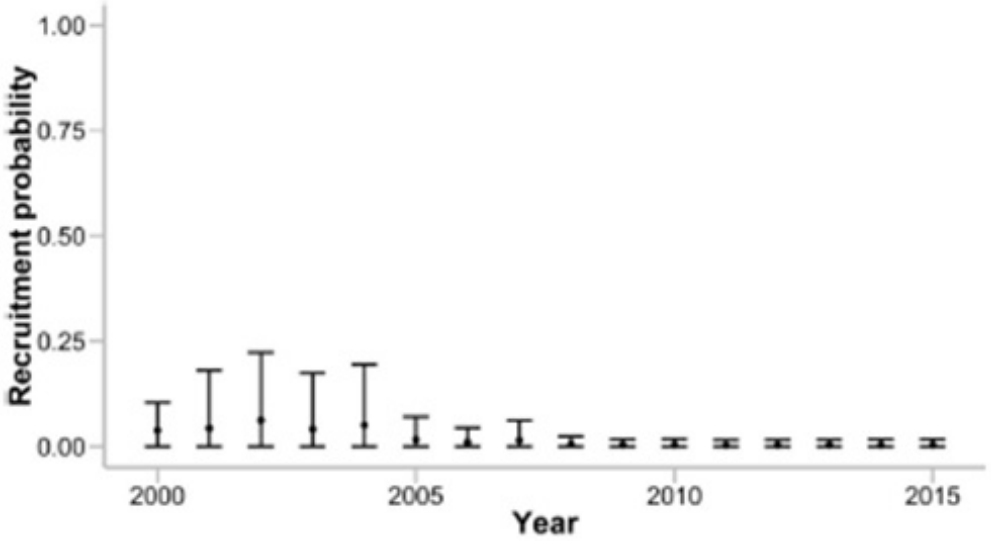

Figure 2. Local per-capita recruitment probability estimates and 95% credible intervals for Yaqui catfish *Ictalurus pricei* from aquatic habitats near and around San Bernardino National Wildlife Refuge.

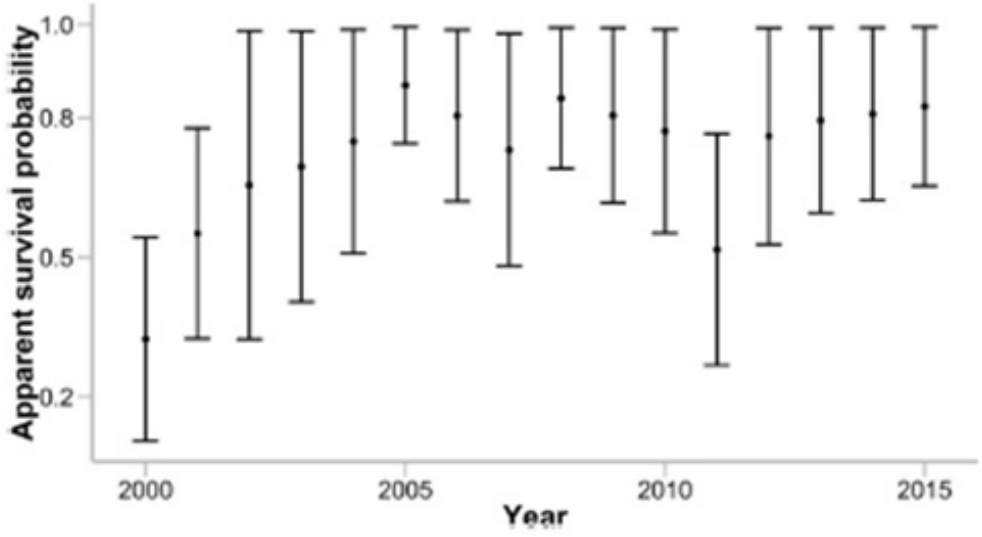

Figure 3. Apparent survival estimates and 95% credible intervals for Yaqui catfish *Ictalurus pricei* from aquatic habitats near and around San Bernardino National Wildlife Refuge.

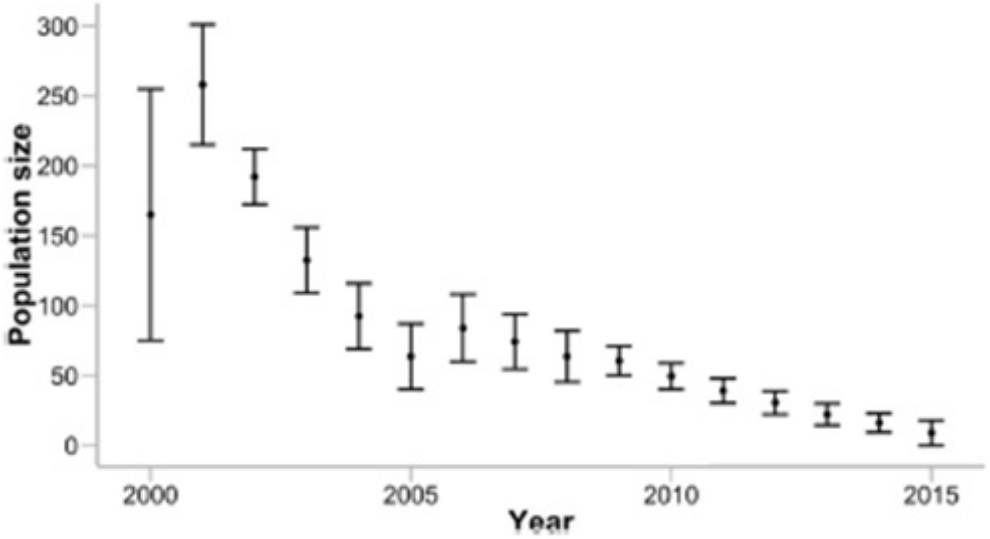

Figure 4. Total abundance estimates and 95% credible intervals for Yaqui catfish *Ictalurus pricei* from aquatic habitats near and around San Bernardino National Wildlife Refuge.

2.3.1.3 Genetics, genetic variation, or trends in genetic variation (e.g., loss of genetic variation, genetic drift, inbreeding, etc.):
The Yaqui catfish has recently been the subject of molecular studies. Varela-Romero et al. (2007) examined *cyt-b* variation in *Ictalurus* samples from across the Rio Yaqui and surrounding basins, and found that samples formed consistent monophyletic groups based on drainage sampled. His results suggest that there may be numerous undescribed, cryptic catfish species within each basin, or taxonomic groups that could be treated as Distinct Population Segments. Additionally, Varela-Romero et al. (2011) identifies that hybridization between *I. pricei* and *I. punctatus* has been documented in Mexico.

In the U.S., *Ictalurus* tissue samples from Twin Pond, House Pond, Big Tank, and numerous sites in the Rio Yaqui in Mexico were genotyped using microsatellite loci to examine for introgression between native *I. pricei* and non-native *I. furcatus* and *I. punctatus*. Preliminary results indicate that there has been no introgression between U.S. populations of Yaqui catfish and non-native catfish species (S. Baker, *public comm., 15 Nov 2008*).

2.3.1.4 Taxonomic classification or changes in nomenclature:
There have been no changes in taxonomy or nomenclature.

2.3.1.5 Spatial distribution, trends in spatial distribution (e.g. increasingly fragmented, increased numbers of corridors, etc.), or historic range (e.g. corrections to the historical range, change in distribution of

the species' within its historic range, etc.):
Hendrickson et al. (1981) showed the range of Yaqui catfish extending from near the Gulf of California to the U.S.-Mexico border. Abarca et al. (1995) and Varela-Romero et al. (2007) provide data on surveys in Mexico, but neither group discovered any Yaqui catfish in their surveys. (Varela-Romero et al. [2007] discovered an apparently native catfish in the Rio Tutuaca, but believe it to be an undescribed species.). Additionally, Varela-Romero et al. (2011) identified that *I. pricei* and *I. punctatus* are hybridizing in parts of Mexico.

2.3.1.6 Habitat or ecosystem conditions (e.g., amount, distribution, and suitability of the habitat or ecosystem):
Habitat conditions in the U.S. continue to improve at San Bernardino NWR and at the nearby conservation easements, but larger wetlands are needed to secure Yaqui catfish populations. At least one larger wetland is currently (2018) under construction. Habitats within this and a few other ponds are being modified with rocky and woody material to provide interstitial spaces and cavities used for spawning, while offering refugia from predation for younger age classes, and feeding areas, important for all size and age classes of Ictalurids (Daugherty et al. 2011; Butler and Wahl 2011). Habitat protection and improvement are spotty in Mexico; however, Varela-Romero et al. (2007) suggest that non-native species present a greater threat to Yaqui catfish than direct habitat destruction.

2.3.1.7 Other:
No other new information is available.

2.3.2 Five-Factor Analysis (threats, conservation measures, and regulatory mechanisms)

2.3.2.1 Present or threatened destruction, modification, or curtailment of its habitat or range:
The listing package for Yaqui catfish enumerated habitat destruction and modification as one of a few threats to the species' continued existence. The destruction and modification of Yaqui catfish habitat has slowed or even been reversed in the U.S. portion of the species' range as a result of conservation and management activities related to wetland-specific habitat protection, restoration, and maintenance that have been pursued by the Fish and Wildlife Service at San Bernardino and Leslie Canyon National Wildlife Refuges. Although habitat is being modified to enhance reproductive potential in wetland ponds in the U.S., the Yaqui catfish is a stream species and the exact mechanisms needed for reproductive success are unknown and may be impossible to replicate in wetland ponds (i.e., flow).

At the watershed scale, protection of the U.S. portion of the upper Rio Yaqui has been greatly assisted by the creation and involvement of the Malpai Borderlands Group, a ranching organization that covers over one million

acres and that is focused on open-space protection and watershed restoration (Curtain 2007). In Mexico, the Cuenca los Ojos foundation has purchased and protected many thousands of acres of the Upper Rio Yaqui watershed, but long-term legal protections are questionable (e.g., governmental expropriation of property for development).

Habitat destruction for freshwater fishes, including Yaqui catfish, includes direct effects such as groundwater pumping and water diversion, and indirect effects such as climate change. Destruction and dewatering of rivers in Mexico continues (Miller et al. 2005) and presents a direct threat. Matthews and Zimmerman (1990) described potential direct (e.g., water warming) effects of climate change on fishes of the southwestern U.S. The IPCC (2007) described changing precipitation patterns at a global scale, and such changes have the potential for detrimental effects to aquifer health for Yaqui catfish.

2.3.2.2 Overutilization for commercial, recreational, scientific, or educational purposes:

Overutilization of Yaqui catfish for any purpose is highly unlikely. However, the species may be threatened by commercial use of non-native species in Mexico, such as blue and channel catfish that are stocked throughout the Yaqui catfish range for recreational and commercial fishery opportunities (Varela-Romero et al. 2011). These species constitute one of two (the other being habitat modification) primary threats to the continued existence of Yaqui catfish.

2.3.2.3 Disease or predation:

The only suspected threat from disease or predation comes from the threat of predation on young Yaqui catfish by flathead catfish (Varela-Romero et al. 2007). The distribution of the flathead catfish across the Rio Yaqui is currently unknown.

2.3.2.4 Inadequacy of existing regulatory mechanisms:

Regulatory mechanisms are adequate in the U.S. portion of the Yaqui catfish range. Such mechanisms deserve greater attention in the Mexico portion of the species' range, where topics from water law to endangered species legislation are too often weakly enforced (see e.g., Fitzgerald et al. 2004). The legal status of Yaqui catfish is currently under review in Mexico, where researchers are recommending that the species be uplisted to endangered under the country's endangered species law (Varela-Romero et al. 2011).

2.3.2.5 Other natural or manmade factors affecting its continued existence:

Progress has been made in protecting Yaqui catfish habitat in the U.S., but gaps exist in our knowledge of the species. Information on factors that are limiting juvenile recruitment in the U.S., and current data from the species'

range in Mexico—especially eastern portions of the Yaqui drainage (Varela-Romero et al. 2007)—are needed to fully assess any additional factors influencing Yaqui catfish conservation.

2.4 Synthesis

Given the background and new information detailed above, we would first describe Yaqui catfish status as poor in the U.S. and through the majority of its range in Mexico (Varela-Romero et al. 2011; Stewart et al. 2017). For example, most of the historic range of Yaqui catfish occurs in the Yaqui, Sonora, Mayo, Fuerte, and Casas Grandes drainage basins in northwestern Mexico (Varela-Romero et al. 2011). The species is extirpated from the Sonora and Casas Grandes drainage basins (Varela-Romero et al. 2011). Ruíz-Campos et al. (2003) also failed to detect this species when sampling in 10 river basins in the Río Yaqui basins where Yaqui catfish were once known to occur (Varela-Romero et al. 2011). As Varela-Romero et al. (2007) emphasize in their review of 2004-2006 survey data, the lack of recent Yaqui catfish captures in Mexico basin suggests that the species is now rare, extirpated from much of its former range, and hybridizing with non-native Ictalurid species (Varela-Romero et al. 2011), and that the Yaqui catfish should be considered critically endangered. Our research (Stewart et al. 2017) coupled with results from Varela-Romero et al. (2011) indicate that the Yaqui catfish is on the brink of global extinction (i.e., US and Mexico).

The next point of interest in this review is the *Yaqui Fishes Recovery Plan*. Problems with the existing plan, including the lack of objective criteria, the multi-species nature of the plan, and dated background material all suggest that new recovery plans should be written for individual Rio Yaqui fish species, and Yaqui catfish specifically. However, developing delisting criteria and the actual delisting of this species does not appear feasible, given the lack of quantifiable information and the continuing risks that have been identified. We do not yet understand population demographics, trends, and other data that would enable us to determine the number of populations or sizes of populations needed to define recovery of this species. There has been no systematic and thorough monitoring for this species in Mexico since Hendrickson et al. (1981). However, exploratory surveys to collect fin clips for genetic assessments or to capture other non-target species have been completed, but these surveys lack the sufficient detail that is need to provide information about Yaqui catfish status in existing and potential habitats. The absence of data throughout the range of Yaqui catfish in Mexico makes the development of objective, measurable criteria relating to occupied habitat impossible. Moreover, we have little knowledge of or influence on the management practices being pursued by officials in Mexico. Threats of hybridizing will continue to exist, and stocking of both channel catfish and flathead catfish will not cease (A. Varela-Romero personal communication). The generation of quantifiable data regarding these current knowledge deficiencies could conceivably be used to develop objective, quantifiable delisting criteria in the future (Stewart et al. 2017; Defenders of Wildlife and WildEarth Guardians 2018 in litt).

In summary, we recommend that Yaqui catfish be uplisted to endangered. Recovery criteria specific to the Yaqui catfish are contingent on the species' status in Mexico, and all additional support afforded by uplisting in the U.S. is essential to the species' existence.

3.0 RESULTS

3.1 Recommended Classification: Given your responses to previous sections, particularly section 2.4. Synthesis, make a recommendation with regard to the listing classification of the species

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

3.2 New Recovery Priority Number (indicate if no change; see Appendix E):

2

Brief Rationale: Reports from Mexico suggests that the species is likely extirpated from the Sonora and Casas Grandes drainage basins (Varela-Romero et al. 2011). Ruiz-Campos et al. (2003) also failed to detect this species when sampling in the Rio Yaqui basins where the Yaqui catfish were once known to occur (Varela-Romero et al. 2011). In short, it is suggested that the species is now rare, and extirpated from much of its former range in Mexico (Varela-Romero et al. 2011). In the U.S., the Yaqui catfish population has collapsed and is now functionally extinct due to a lack of recruitment of juveniles into the breeding population (Stewart et al. 2017). The Yaqui catfish is facing high and imminent threats and is currently on the brink of global extinction.

3.3 Listing and Reclassification Priority Number, if reclassification is recommended *(see Appendix E)*

Reclassification (from Threatened to Endangered) Priority Number: __2__
Reclassification (from Endangered to Threatened) Priority Number: ____
Delisting (Removal from list regardless of current classification) Priority Number: ____

Brief Rationale: The Yaqui catfish is a full species that is facing high and imminent threats, necessitating a priority of 2.

4.0 RECOMMENDATIONS FOR FUTURE ACTIONS

Because 98% of the geographic range of this species exists in the Republic of Mexico, recovery of the Yaqui catfish must occur in that country for the fish to avoid extinction. A first step toward potential recovery would be to survey potential wetland habitat in Mexico to determine presence/absence of Yaqui catfish, and plans are underway to collect water

samples through monitoring efforts in Sonora, Mexico. These water samples would then be analyzed in the U.S. for eDNA of Yaqui catfish. Once areas having extant populations of Yaqui catfish are identified, planning could be accomplished to protect those occupied habitats as natural refugia for Yaqui catfish and/or to collect a subsample of the catfish population in those habitats and propagate them in suitable hatcheries in Mexico and the U.S. to produce stock for potential reintroduction efforts in protected waters. Any reintroduction program will require finding and collecting genetically heterozygous Yaqui catfish for potential propagation in a hatchery environment; developing consistent captive propagation techniques and a genetic management plan; identifying secure, suitable wetlands in both Mexico and the U.S.; establishing Yaqui catfish into those wetlands; ultimately documenting sustaining self-perpetuating populations; and abolishing the captive propagation and stocking of non-native channel catfish and flathead catfish in Sonora, Mexico. While these concepts seem sound, implementation is limited by funding availability, permitting obstacles, and by access limitations into the lotic systems in rural Mexico by researchers. Many of the areas containing potential catfish habitat are currently (2019) under the control of drug cartels who threaten the safety of researchers in Mexico.

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APPENDICES

Appendix A – Highlights of Comments

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1. Summary of Results of Peer Review Process

Public Comments: The Service received public comments from two non-profit organizations. Defenders of Wildlife and WildEarth Guardians sent a six-page letter dated July 2, 2018. The concerns and recommendations expressed by Defenders of Wildlife and WildEarth Guardians are addressed in the threats and synthesis sections of the document. Members of both organizations are greatly concerned about the loss of the United States population and the serious reduction in abundance and range in Mexico. They are also concerned about the impacts of hybridization with channel catfish, habitat loss in Mexico, and also climate change. They ask that our restoration efforts continue, and they encourage collaboration by USFWS and Mexican agencies and scientists as it will be essential to stabilize the catfish in its Mexican range and initiate hatchery breeding to bolster Mexican populations and reestablish populations in the U.S. Arizona Game and Fish Department (Department) sent a six-page letter dated July 2, 2018. The Department expressed their mutual desire to develop and implement programs to conserve species that are listed under the ESA, while also detailing their commitment to work together for five-year reviews of endangered and threatened species.

U.S. FISH AND WILDLIFE SERVICE
FIVE-YEAR REVIEW of *Ictalurus pricei*

Current Classification:

Recommendation resulting from the Five-Year Review:

____ Downlist to Threatened
__X__ Uplist to Endangered
____ Delist
____ No change needed

Appropriate Listing/Reclassification Priority Number, if applicable: 2

Review Conducted By: San Bernardino National Wildlife Refuge, Douglas, Arizona

The lead Field Office must ensure that other offices within the range of the species have been provided adequate opportunity to review and comment prior to the review's completion. The lead field office should document this coordination in the agency record.

REGIONAL OFFICE APPROVAL:

The Regional Director or the Assistant Regional Director, if authority has been delegated to the Assistant Regional Director, must sign all five-year reviews.

Acting **Assistant Regional Director, Ecological Services, U.S. Fish and Wildlife Service**

Approve _____ Date 5·30·19