

5-YEAR REVIEW

Warner sucker (*Catostomus warnerensis*)

GENERAL INFORMATION:

Species: Warner sucker (*Catostomus warnerensis*)

Date listed: September 27, 1985

FR citation(s): [50 FR 39117](#)

Classification: Threatened

BACKGROUND:

Most recent status review: The previous Warner sucker 5-year review was finalized on December 16, 2019, and is available at: https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/2922.pdf. No significant new information regarding the biological status of the Warner sucker has become available since the last 5-year review that would warrant changing its current threatened status.

FR Notice citation announcing this status review: [88 FR 17611](#). Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status Reviews for 133 Species in Oregon, Washington, Idaho, Montana, California, Nevada, Hawaii, Guam, and the Commonwealth of Northern Mariana Islands. March 23, 2023.

ASSESSMENT:

This 5-year review was conducted by the U.S. Fish and Wildlife Service's (Service) Oregon Fish and Wildlife Office. Data for this review were solicited from interested parties through the Federal Register notice ([88 FR 17611](#)) announcing this review on March 23, 2023. We also contacted local and state biologists from Oregon Department of Fish and Wildlife (ODFW) and the Warner Basin Aquatic Habitat Partnership (WBAHP) to request any data or information we should consider in our review. As a result, we received one comment letter from ODFW on June 5, 2023. Additionally, we conducted a literature search and a review of information in our files.

Since the last 5-year review in 2019, management actions for the Warner sucker have continued, no new threats have been identified, and a new previously unsampled but densely populated pool was discovered in Deep Creek. While this previously unsampled pool provides evidence of reproduction in Deep Creek, it does not warrant a change in the species status. In addition, there is no significant new information that changes our understanding of the species' biology and life history since 1998 when the Recovery Plan for the Threatened and Rare Native Fishes of the Warner Basin and Alkali Subbasin ([Recovery Plan](#))(USFWS 1998), which includes the Warner sucker, was finalized.

Recommendations from the 2019 5-Year Review:

The 2019 5-year review included the following recommendations:

- Connectivity (fish passage and screening) efforts are the most important factors contributing to the recovery of Warner sucker and cooperative implementation of the species' Strategic Action Plan (SAP) is the best path forward to achieve Warner sucker recovery.
- Self-sustaining populations solely within the lakes are not required for recovery as the lakes desiccate during times of drought. However, the lakes provide value during periods of average to above average precipitation as they allow opportunity for inter-basin connectivity and population/genetic mixing as well as productive habitat for growth and maturation.
- Currently, Warner sucker connection between Twentymile Creek and Crump Lake is one-directional downstream during high water years, with no upstream connection from Crump Lake to Twentymile Creek due to irrigation infrastructure barriers in the lower watershed. The Service does not consider this loss of upstream connectivity precluding recovery or preventing a functional metapopulation if connectivity is possible through the lakes (when inundated) and between the two other primary drainages, Honey Creek and Deep Creek.

New Information:

The ODFW and the WBAHP made significant progress for Warner sucker recovery since the last 5-year review in 2019. The WBAHP acquired a Focused Investment Partnership (FIP) from the Oregon Watershed Enhancement Board (OWEB) to provide \$5.8 million in funding for improving upstream fish passage and screening of diversion in the basin. This FIP was for 3 biennia (6 years) between 2019 and 2025. In addition to the funding from OWEB, ODFW invested substantial effort in the Warner basin studying the effectiveness of new passage structures and surveying the population in Deep Creek. These efforts include a Deep Creek population survey (Monzyk et al. 2021), several fish passage project monitoring studies (Monzyk and Harrison 2019, Monzyk and Harrison 2022), a study on the thermal tolerance of the Warner sucker (Anlauf-Dunn and Cornwell 2023), and an evaluation of the use of eDNA to detect and quantify Warner sucker abundance (Monzyk et al. 2023). These reports add to our knowledge and understanding of Warner sucker passage project success, population distributions, and thermal tolerances. The findings of the reports will be discussed further in relation to each recovery criterion. In addition, the WBAHP made substantial progress implementing the SAP by addressing fish passage at barriers on Deep Creek (Adel Town, Starveout, Relic, Middle, and O'Keefe) and Honey Creek (Plush Town Ditch and JJ). There are more barriers to be addressed and questions to be answered but the rate of progress over the last five years for Warner sucker recovery has been the greatest since the species was listed. This progress is in large thanks to the WBAHP and ODFW's efforts in the Warner Basin.

Recovery Criteria

The three recovery criteria in the Recovery Plan (USFWS 1998, pp. 40-41) are:

1. A self-sustaining metapopulation is distributed throughout the Twentymile, Honey, and Deep Creek (below the falls) drainages and in Pelican, Crump, and Hart Lakes.
2. Passage is restored within and among the Twentymile, Honey and Deep Creek (below the falls) drainages so that individual populations of Warner sucker can function as a metapopulation.
3. No threats exist that would likely threaten the survival of the species over a significant portion of its range.

Recovery Criterion 1 (RC1) - A self-sustaining metapopulation is distributed throughout the Twentymile, Honey, and Deep Creek (below the falls) drainages and in Pelican, Crump, and Hart Lakes.

New information regarding RC1:

Recent population estimates conducted on stream reaches where access had previously been denied indicate that the Deep Creek population is likely much larger than the previous estimate of 150 fish suggested (Scheerer et al. 2007b, p. 9; Monzyk et al. 2021, Table 1). Monzyk et al. (2021, p. 10) surveyed a densely populated pool upstream of the Starveout diversion increasing the Warner sucker estimate in Deep Creek to approximately 2,572 fish. This finding is important because the single previous population survey found all 150 fish in a reach downstream of the Starveout Diversion, suggesting the fish could have been migrants from Crump Lake rather than a reproducing population in the lower reaches of Deep Creek. In 2024, additional surveys by ODFW detected all age groups, including adults, upstream of the Starveout diversion and barrier, which provides additional evidence of reproduction occurring in Deep Creek (ODFW, unpublished data).

While this evidence of a larger population in Deep Creek is important, it also highlights the lack of baseline data throughout the Deep Creek drainage. There are only two population estimates for Warner sucker in Deep Creek from different locations and 13 years apart (Table 1). A larger population has likely been present in this system for many years but lack of access for surveys has resulted in limited data sets for use in comparing population estimates. It will be useful to continue to monitor these reaches so that year to year comparisons can be conducted.

Population estimates completed for the Warner sucker throughout its range have been opportunistic and rarely come from the same stream reaches. Development of standardized methods for sampling reaches and sampling frequency are necessary to establish population trends over time. Private property access has complicated consistent data collection in the past, however, consistent outreach efforts by ODFW and WBHAP are forging relationships and opening access for future surveys.

Table 1. History of population sampling data for Honey Creek, Deep Creek, Twentymile Creek, Hart Lake and the population at Summer Lake Wildlife Management Area, (table updated from Monzyk 2019, p. 10)

Year	Reach	Population estimates	95% CI	Study
Honey Creek				
1994	Snyder Gorge	76	Snorkel Estimate	Tait et al. 1995, p. 26
1994	JJ diversion to Twelvemile Creek	245	Snorkel Estimate	Tait et al. 1995, p. 26
2007	All except lower 3.7 km and most of Snyder Creek	2,202	81%	Scheerer et al. 2007, p. 9
2011	All except lower 3.7 km and Snyder Creek	4,718	3,868 - 5,683	Scheerer et al. 2011, p. 6
2013	Town diversion to mouth (lower 3.7 km)	410	169 - 721	Scheerer et al. 2013, p. 4
Deep Creek				
2007	Relic Diversion to Starveout diversion (1.3 km)	150	192%	Scheerer et al. 2007, p. 9
2020	Relic Diversion to O'Keefe and 1.5km of the Town Irrigation Ditch	2,572	1,567 – 4,351	Monzyk et al. 2021, p. 10
Twentymile Creek				
1994	½ mile upstream of Dyke to a mile past Horse Creek on Twelvemile	1,779	Snorkel Estimate	Tait et al 1995, p. 26
2007	All	4,746	164%	Scheerer et al. 2007 p. 9
2009	All	4,612	3,820 - 5,567	Richardson et al. 2010, p. 8
2009	Cahill wind deflector to Dyke diversion	677	299 - 1,334	Richardson et al. 2010, p. 9
2009	Upstream of Twelvemile Creek confluence	49	15 - 85	Richardson et al. 2010, p. 9
2009	Dyke diversion to O'Keefe Dam	3,779	3,112 - 4,603	Richardson et al. 2010, p. 9
2009	O'Keefe Dam to Cowhead Slough (Twelvemile Creek)	155	63 - 311	Richardson et al. 2010, p. 9
2014	Cahill wing deflector to Dyke diversion	482	368 - 638	Scheerer et al. 2014, p. 8
2015	MC diversion to Dyke diversion	813	761 - 861	Scheerer et al. 2015, p. 6
2016	Cahill diversion to MC diversion (MC canal)	963	860 - 999	Scheerer et al. 2017, p. 9
Hart Lake				
1996	n/a	493	439 - 563	Allen et al. 2006, p. 14
2008	n/a	565	250 - 1,114	Scheerer et al. 2008, p. 25
2012	n/a	1,378	705 - 2,650	Scheerer et al. 2012, p. 17
2017	n/a	5	-	Scheerer and Meeuwig 2017, p. 15
Summer Lake Wildlife Management Area				

2007	Entire Ditch	142	91-218	Scheerer et al. 2007, p. 9
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Future Needs Relating to Recovery Criterion 1

Population monitoring has been opportunistic, and information needed to evaluate trends in self-sustaining populations is disjunct and/or inconclusive. To better understand population status and trends, the Service and ODFW should collaborate to develop and implement a statistically rigorous sampling protocol to evaluate population structure and trend for the three stream systems (Honey Creek, Deep Creek, and Twentymile Creek) that comprise the core Warner Sucker distribution. Evaluations of the lake populations is not recommended considering that the lakes periodically desiccate negating the need to quantify lake population trends. Recent eDNA sampling was conducted for Warner suckers and it appears to be a promising tool for determining presence, however further refinement of the technique is needed before it can be used to estimate abundance (Monzyk et al. 2023, pp. 18-20).

Recovery Criterion 2 (RC2) - Passage is restored within and among the Twentymile, Honey and Deep Creek (below the falls) drainages so that individual Warner sucker populations can function as a metapopulation.

New information regarding RC2:

Since the last 5-year review (2019), ODFW has completed additional surveys and provided monitoring reports regarding the success of several completed passage projects (Table 2, including surveys prior to the 2019 5-year review). Success of passage is defined as Warner suckers being physically able to pass the structures. Caution should be used when looking at the percentage of fish that pass a structure as volitional passage is influenced by individual fish and not all fish choose to move upstream.

Table 2. Status of Warner Basin Diversions passage and screening efforts.

Diversion	Upstream Passage Completed	Screening	Passage Evaluated/Note
Twentymile Creek			
Dyke Diversion	2015	2015	Scheerer et al 2017
MC Diversion	2018		Monzyk and Meeuwig 2018 and 2019; Monzyk and Harrison 2019
Cahill Diversion	-	-	-
Greaser Reservoir	-	-	-
MC Dam	-	-	-
Deep Creek			
Adel Town Diversion	2019	-	2021 Monzyk et al. 2021 Monzyk and Harrison 2022
Starveout/O’Keefe Diversions	2021	-	2021 Monzyk et al. 2021 Monzyk and Harrison 2022

Relic Diversion	2021	-	Monzyk and Harrison 2022
Givans/Taylor Diversion	-	-	-
Middle Diversion	2022	Combined with O'Keefe	-
O'Keefe Diversion	2023	Yes	Testing Planned for 2024
Honey Creek			
Rookery Diversion	2016	2014	Scheerer and Meeuwig 2017
Flood Ditch	2018	2018	-
Plush Town Ditch	2022	2022	Monzyk and Harrison 2022
JJ Diversion	2023	2023/4	Evaluation planned for 2024
East Field	-	-	Passage planned for 2025
Fish Hatchery	-	-	Passage planned for 2025
Middle Ditch	-	-	Passage planned for 2025
Hidden Ditch	-	-	Passage planned for 2025

Twentymile:

The MC Diversion on Twentymile Creek had a passage restoration project implemented in 2017; passage success at this location was evaluated in 2018 and only one of the 21 tagged Warner suckers successfully navigated the new bypass (Monzyk and Meeuwig 2018, p. 8). In 2019, ODFW reassessed passage effectiveness following a modification to improve irrigation and found that 43 percent (13 of 30) of tagged fish passed the diversion moving upstream, although the successful suckers tended to be of larger size (Monzyk and Harrison, 2019, p. 8-9). It is hypothesized that improved passage in 2019 is due to improved bypass operations and consistently higher flows in 2019 compared to 2018 (Monzyk and Harrison 2019, p. 13).

Deep Creek:

Deep creek passage was evaluated in 2021 at the Relic Diversion, Starveout Diversion and Adel Town Diversion (Monzyk and Harrison 2022). Each of these diversions have had constructed rock riffles installed to provide upstream Warner sucker passage when flows were sufficient. Due to drought conditions, Deep Creek experienced severe low flows in 2021, which reduced the time periods where water could inundate the rock ramps in the spring and provide passage. Regardless of the low flows, successful passage was detected at all three passage projects. Three of eight tagged suckers below the Relic Diversion passed upstream, two of 23 tagged suckers released below the Starveout Diversion passed upstream and three of 15 suckers released below the Adel Town Diversion passed upstream (Monzyk et al. 2021, pp. 13-14). Passage success in Deep Creek was evaluated again in 2022 when flows were higher, resulting in improved fish passage. At the Starveout diversion, seven of 23 fish were successful in upstream passage. At the Adel Town Diversion, eight of the 15 fish tagged and released in 2021 passed the ramp in 2022 resulting in an overall combined passage success of 73 percent (Monzyk and Harrison 2022, p. 8). Of the suckers that were able to pass the Adel Town Diversion, 60 percent eventually entered the Adel Town Irrigation ditch (Monzyk and Harrison 2022, p. 9). This irrigation ditch has year-

round water, streamside vegetation and potentially deep pools creating habitat for Warner sucker. However, water velocities at the headgate prevent suckers from returning to Deep Creek during spawning season and if suckers persist in the irrigation ditch, they are isolated from other populations in Deep Creek and are unscreened from flood irrigation turnouts along the irrigation system. Passage effectiveness at the Relic Diversion was not re-evaluated in 2022.

Honey Creek:

In 2022, ODFW evaluated passage success at the Plush Town Diversion on Honey Creek. This passage project involved installation of an engineered fishway to provide passage past the diversion. Of the 13 tagged suckers released below the diversion ten (77 percent) were able to pass upstream, though passage could be improved with more consistent management of the diversion as it was designed. Stream flows passing the diversion either went downstream over the weir not allowing fish passage or over the fishway with plywood risers blocking the fish passage channel (Monzyk and Harrison 2022, pp. 11-12). The design has been modified to improve passage but has not been reassessed. Above the Plush Town Diversion, passage was improved in 2023 at the JJ Diversion and was tested in 2024, though results are not yet available. There are no other known passage barriers upstream of the JJ Diversion.

Future Needs Relating to Recovery Criterion 2

Upstream passage has been provided or is planned for all known barriers on Honey Creek. The WBAHP is working to screen and provide upstream passage at the remaining diversions including Fish Hatchery, East Field Ditch, Middle Ditch and Hidden Ditch. Deep Creek has had upstream passage addressed at all the known diversions. Downstream passage (screening) is still needed on Deep Creek at the Deep Creek Town, Starveout, O'Keefe, and Relic diversions (Table 2). Evaluation of the Deep Creek Town diversion and irrigation system is underway to see where and how screening of this system would be most effective or if upstream passage is needed for Warner suckers to be able to escape the irrigation system. For Twentymile Creek, upstream passage has been provided at all diversions upstream from Cahill diversion. Downstream of the Cahill diversion the stream goes into a series of irrigation canals and ditches that are occupied by nonnative species. It was determined that providing passage at the diversion would likely spread nonnatives upstream and therefore, it is not considered a beneficial action. Screening should be considered at this diversion so that Warner suckers do not pass into the irrigation system as it is currently considered the terminus of Twentymile Creek and Warner suckers that pass this point are lost from the population. Additionally, the Twentymile flood channel that begins downstream of the MC dam and ends in Greaser Reservoir likely sees Warner sucker move downstream into the channel and ultimately into Greaser Reservoir. It is unknown if Warner suckers persist in the channel or in Greaser Reservoir and additional assessment should be undertaken to evaluate the importance of the ditch and Greaser Reservoir to see if during above average precipitation periods connection from Crump Lake is possible. It is also important to understand the distribution of non-native fish downstream of the MC Diversion. This would be informative in evaluating the need for passage projects at the Greaser Reservoir spillway and the MC dam.

The passage facilities at the various diversions around the basin can be complex and require active management to operate in a manner that achieves their designed fish passage goals. Management effectiveness monitoring should be conducted to ensure this active management is occurring. The WBAHP is working on operations manuals for the various diversions to help land managers operate the facilities to maximize fish passage. Additional monitoring potentially using data loggers may help managers better understand when the passage channels are operating.

Recovery Criterion 3 (RC3) - No threats exist that would likely threaten the survival of the species over a significant portion of its range.

New information regarding RC3:

The latest information relating to other threats include a 2023 report evaluating Warner sucker thermal tolerance. This report found that Warner suckers are likely metabolically constrained when water temperatures are greater than 23°C (73.4°F) (Anlauf-Dunn and Cornwell 2023, p. 4). Specifically, Warner suckers were found to be capable of three minutes of maximal swimming during tests above 23°C but because of the decline in routine metabolic rates, performance is expected to decline at temperatures greater than 23°C. The report's finding suggests access to cooler water (e.g., springs, reliable streamflow, groundwater influenced stream reaches and deep pools) will be important as climates may become warmer and drier in the Warner basin (Anlauf-Dunn and Cornwell 2003, p. 4). While this report adds to the knowledge base regarding the threat of climate change to the Warner sucker it still leaves managers with important questions, including how do the current thermal regimes of Deep Creek, Twentymile Creek and Honey Creek compare with the findings of this report? Additionally, models (e.g., VELMA efforts by ODFW) of these drainages may provide valuable insight into thermal refugia for Warner sucker given the potential impacts of climate change.

Research Needs Relating to Recovery Criterion 3

To assess the threat of climate change and further investigate thermal tolerance, we recommend that the Service and ODFW conduct baseline temperature monitoring around the Warner basin. This could be as simple as temperature loggers installed in two or three locations per drainage. Without this information, it is unknown how temperatures are changing or how much of a concern climate change may be for Warner sucker. This should be cross-walked with climate change predictive models for the Warner Basin to develop a robust prediction of future stream and lake conditions in the basin. This important information could identify priority locations and incentives to working with local agricultural communities around water conservation in the basin.

Conclusion:

Significant progress has been made in the last five years thanks to the work of the WBAHP and ODFW in providing upstream passage at seven irrigation diversions, screening at three diversions and monitoring their effectiveness. These efforts have improved connectivity

throughout the basin and are major steps towards the completion of RC2. The efforts towards recovery in the last five years have progressed at the highest rate since the recovery plan was published in 1998. This would not have been possible without the efforts of the WBHAP, the FIP funding from OWEB, ODFW and the local landowners.

The above information addressing the three Recovery Criteria confirm the species is still present and reproducing in the Warner Basin, including the three main drainages of Deep, Twentymile and Honey Creek. However, current information and trends on species distribution and abundance is challenging to evaluate due to inconsistent sampling locations and techniques used (Table 1). The efforts of the WBAHP have achieved upstream passage at most of the irrigation dams in Deep, Honey and Twentymile Creeks. There are only a few diversions left where upstream passage has not been provided and designs are currently being worked on to restore passage at these sites. Downstream passage (screening) remains a challenging task for the Deep Creek diversions. These diversions are atypical, in that they often divert 100% of the streamflow a typical screen bypasses fish and water downstream of the diversion into a flowing creek. These diversions will need designs that screen without bypassing fish into a dry channel. Additionally, while upstream passage of suckers has been tested and demonstrated at the retrofitted or reconstructed diversions, the operations of these facilities can be complicated. It will take time to see if the passage facilities are being managed properly to allow for volitional fish passage throughout the basin. Finally, the impacts from the threat of climate change to Warner sucker is unknown because while we know the species' thermal tolerances, we do not know the species' response to thermal changes in the basin. Therefore, evaluation of existing and predicted conditions for the Warner Basin under different climate change scenarios would be helpful.

To summarize, uncertainties remain regarding basin and stream-wide passage success, additional and consistent monitoring of population metrics is recommended, and due to the unknown risks of climate change there should be continued research into current conditions and how those conditions may change into the future. The Service will continue to work with and partner with ODFW and the WBAHP to help achieve these goals.

After reviewing the best available scientific information, we conclude the Warner sucker remains a threatened species. The evaluation of threats affecting the species under the factors in 4(a)(1) of the Act and analysis of the status of the species in our most recent status review (USFWS 2019)] remains an accurate reflection of the species' status.

RECOMMENDATIONS FOR FUTURE ACTIONS:

Continued passage and screening and effectiveness monitoring:

Continue to support the efforts of the WBAHP to implement the SAP prioritizing the passage and screening of diversions in the Warner Basin (Table 2). Passage and screening are still a priority action for all three tributaries. This includes completing screening for the Deep Creek diversions and evaluating options for screening or passage within the Deep Creek ditch network.

ODFW has evaluated the majority of the upstream passage projects for effectiveness, and they have been shown to pass Warner sucker upstream under ideal conditions and proper management. Management effectiveness monitoring should be conducted to ensure that fish passage facilities and investments are being operated by landowners as designed to provide passage. Additionally, we support the WBAHP's completion of an operations manual for each facility.

Thermal and climate investigation.

The Service should work with partners including WBAHP and ODFW to collect baseline temperature data around the basin. The ODFW comment letter noted that there is a statewide stream temperature monitoring plan that will have applied local outcomes for the Warner Basin. Those outcomes are under development but could be supported by basin wide thermal monitoring. Once temperature monitoring has been undertaken in the basin, this information can be used to assess the threat of climate change and its potential impact on the Warner sucker.

Population and distribution assessment.

The Service should collaborate with ODFW and WBAHP to develop and implement a statistically based sampling protocol to evaluate Warner sucker population trends and demographics in Deep, Honey and Twentymile Creeks. Additionally, distribution investigations should be conducted on Twentymile Creek downstream of the MC dam; it is unknown if Warner suckers persist in the flood channel or in Greaser Reservoir and an assessment should be conducted to evaluate the importance of the flood channel and the reservoir to inform whether additional passage efforts at the MC dam or Greaser reservoir would be beneficial.

Lead Field Supervisor, Fish and Wildlife Service

Approve _____ Date _____

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