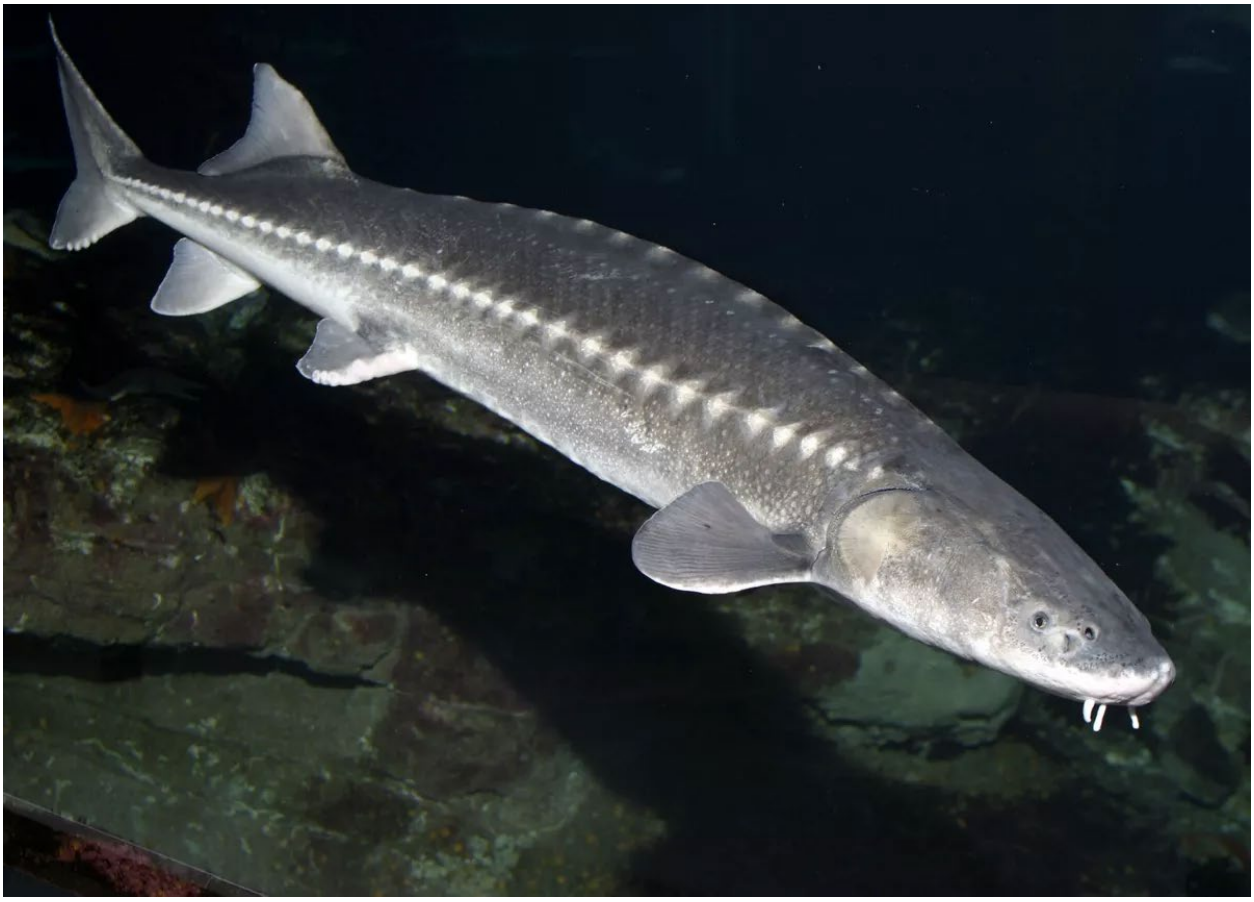
Kootenai River White Sturgeon
(*Acipenser transmontanus*)

5-Year Review
Summary and Evaluation



Spokesman-Review 2015

U.S. Fish and Wildlife Service
Idaho Fish and Wildlife Office
Coeur d'Alene, Idaho

August 2024

5-YEAR REVIEW

Species reviewed: Kootenai River White Sturgeon (*Acipenser transmontanus*)

TABLE OF CONTENTS

5-YEAR REVIEW
Kootenai River White Sturgeon /*Acipenser transmontanus*

1.0 GENERAL INFORMATION

1.1 Reviewers:

Ahren Ramirez, Fish and Wildlife Biologist (ahren_ramirez@fws.gov)
Tracy Melbihess, Idaho Assistant State Supervisor (tracy_melbihess@fws.gov)
Sandi Fisher, Idaho Deputy State Supervisor (sandi_fisher@fws.gov)
Lisa Ellis, Idaho State Supervisor (lisa_ellis@fws.gov)

Lead Regional Office:
Pacific Region, Portland, OR

Lead Field Office:
Idaho Fish and Wildlife Office, Coeur d'Alene, ID
Ahren Ramirez, Fish and Wildlife Biologist (ahren_ramirez@fws.gov)

1.2 Methodology used to complete the review:

This 5-year review was conducted by the U.S. Fish and Wildlife Service's (USFWS) Idaho Fish and Wildlife Office (IFWO) in Coeur d'Alene, ID. Data for this review was solicited from interested parties through a Federal Register notice announcing this review on March 23, 2023. We also contacted members of the Kootenai River White Sturgeon Recovery Team (Recovery Team), which included individuals from State and Federal agencies, and Tribes, to request any data or information we should consider in our review. Additionally, we conducted a literature search and a review of information in our files.

1.3 Background:

1.3.1 FR Notice citation announcing initiation of this review:

March 23, 2023 (88 FR 17611-17614)

1.3.2 Listing history:

FR notice: 59 FR 45989
Date listed: September 6, 1994
Entity listed: DPS
Classification: Endangered

1.3.3 Associated rulemakings:

Final Designation of Critical Habitat
FR notice: 66 FR 46548
Date: September 6, 2001

Designation of Critical Habitat: Interim Rule
FR notice: 71 FR 6383
Date: February 8, 2006

Critical Habitat Revised Designation: Final Rule
FR notice: 73 FR 39506
Date: July 9, 2008

1.3.4 Review History:

White sturgeon (*Acipenser transmontanus*) 5-Year Review
Published: August 9, 2011
Recommendation: No change in status

White sturgeon (*Acipenser transmontanus*) 5-Year Review
Published: September 25, 2018
Recommendation: No change in status

1.3.5 Species' Recovery Priority Number at start of this 5-year review:

3C

1.3.6 Current Recovery Plan or Outline

Name of plan or outline: Revised Recovery Plan for the Kootenai River Distinct Population Segment of the White Sturgeon
Date issued: September 23, 2019

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
_____No

2.1.2 Is the species under review listed as a DPS?

__X__Yes
_____No

2.1.3 Was the DPS listed prior to 1996?

__X__Yes, Listed September 6, 1994 (59 FR 45989).

_____No

2.1.3.1 Prior to this 5-year review, was the DPS classification reviewed to ensure it meets the 1996 policy standards?

__X__ Yes

Flory, J.E. 2011. Status Review for Kootenai River White Sturgeon (*Acipenser transmontanus*) U.S. Fish and Wildlife Service, Region 1, Spokane WA. pp. 3-7.

_____ No

2.1.4 Is there relevant new information for this species regarding the application of the DPS policy?

_____ Yes
__X__ No

2.2 Recovery Criteria

2.2.1 Does the species have a final, approved recovery plan objective, measurable criteria?

__X__ Yes
_____ No

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

2.2.2.2 Are all of the 5 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
_____ No

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.

The Recovery Criteria from the 2019 Revised Recovery Plan for the Kootenai River Distinct Population Segment of the White Sturgeon are:

Downlisting Criterion – Kootenai sturgeon demonstrate consistent natural in-river production of juveniles, with production of wild age-3 juveniles occurring at an annual average of at least 700 individuals over 10

consecutive years. Production of 700 or more wild age-3 juveniles occurs in at least 3 of the 10 years, ensuring the annual average is not the result of an anomalous single-year event (USFWS 2019).

Delisting Criterion – The number of Kootenai sturgeon wild recruits (offspring that survive to sexual maturity at 25 years of age) added to the adult (25 years or older) population annually averages at least 250 individuals per year over 10 years. In addition, the population includes at least 10,000 wild juveniles aged from 3 to 24 years (USFWS 2019).

At the time of this review, recovery criteria have not been met for downlisting or delisting of Kootenai River white sturgeon. Abundance modeling continues to show a decline of wild adult sturgeon with limited annual recruitment (Hardy et al. 2020; IDFG, unpublished). The juvenile population is supplemented by hatchery reared family groups.

2.3 Synthesis

Kootenai River white sturgeon (KRWS) has remained an isolated white sturgeon population for approximately 10,000 years. The current occupied habitat range extends from Kootenai Falls, Montana to the Cora Linn Dam in British Columbia for a total of 168 river miles. KRWS was listed as an endangered species in 1994 after documentation of a significant population and recruitment decline, particularly after the construction of Libby Dam. Originally 11.2 river miles (RM) of the Kootenai River were designated critical habitat in 2001 (66 FR 46548-46561). However, this original designation did not contain adequate stretches of rocky substrate. An additional 7.1 RM were designated in 2008 for a continuous total of 18.3 RM stretching from RM 141.4 to RM 159.7 in the Idaho portion of the river. (73 FR 39506-39523). Current modeling by Idaho Department of Fish and Game (IDFG) estimates that the KWRS population is between 892 to 1575 wild adults as of 2021 (IDFG, unpublished).

Development of the Kootenai River has significantly altered physical characteristics and ecological functions that KRWS had previously relied upon. Hydro dams have altered natural flow regimes and water temperature that KRWS rely on for migration and spawning cues. Altered river flows have also disrupted sediment distribution, resulting in large stretches of gravely river substrate being replaced by silt, which is not conducive to KRWS rearing. Development along the river has resulted in a disconnect to off-channel habitat which historically provided rearing habitat for KRWS and nutrient sources for the river system. This accumulation of effects has negatively impacted the survival of early life stage and juveniles, with only an estimated 85 wild juveniles produced in-river each year. The current wild recruitment rate is not enough to replace the aging out population or promote natural recovery (Hardy et al. 2020).

To identify limiting factors in KWRS recovery and monitor the success of ongoing actions, the IFWO has partnered with the multi-agency Recovery Team to identify the following key actions to address the impacts to KRWS recruitment and habitat quality (USFWS 2019).

Conservation Aquaculture: The Kootenai Tribe of Idaho (KTOI) operates two hatchery facilities to spawn and rear early life stage KRWS for release, which is supported by a USFWS Section 10 Recovery Permit. KTOI annually releases 500 juvenile KRWS from each spawned family group (maximum of 250,000 individuals) in an attempt to supplement recruitment and prevent the species' extinction in the river system. KTOI monitors the growth and genetic health of released groups to ensure the population remains genetically diverse with the greatest chance to contribute to the next generations.

In recent years KTOI has been developing plans to address the occurrence of spontaneous autoploidy (12N) in hatchery reared sturgeon, both in hatchery facility and in-river. 12N individuals were first detected during routine genetics monitoring in the 2011-year class juveniles. Currently there is no identified reason why autoploidy occurs or how common it is in the wild population. These 12N individuals have additional chromosomes and while they can reproduce the following generations will be sterile, which can be detrimental to long term recovery. Sterile individuals would be unable to contribute to long term recruitment and would divert resources away from genetically viable sturgeon. KTOI currently screens hatchery juveniles for 12N individuals to prevent additional introduction to the river system. Additionally, KTOI is working on a proposal to remove hatchery-reared 12N individuals in-river before they can produce sterile offspring (KTOI 2023).

Flow and Temperature Management: IFWO partners with Federal, Tribal, and State agencies to annually manage flow rates and discharge time periods from Libby Dam. The goal is to mimic natural cues for KWRS to begin migration and provide optimal flow velocity and pool depth for spawning in critical habitat (USFWS 2006).

Nutrient Addition: The construction of Libby Dam and disconnection from off-channel habitats have resulted in a nutrient sink within the Kootenai River. To restore river productivity, phosphorous and nitrogen are artificially introduced below Libby Dam with the intent to restore ecological functionality that will benefit all species within the river system. (NMFS 2020).

Restore and Enhance Habitat: The characteristics of the Kootenai River have changed to the point that limited spawning and rearing habitat is available for KWRS. Restoration projects to address this problem have included restoring large stretches of rocky substrate to critical habitat, improving river complexity with deep pools, and reconnecting floodplains to the river system.

Population Research, Monitoring, and Evaluation: Information on recruitment bottlenecks is still limited, particularly for the early life stages. KTOI has utilized early life stage hatchery releases to monitor egg and larval mortality to determine environmental, genetic, and timing factors that may be limiting natural recruitment in the river (KTOI 2023, USFWS 2006). IDFG has modeled recruitment and wild adult abundance in the river to estimate current population numbers and trends.

Despite efforts to improve habitat and reduce recruitment limiting factors, KRWS has not met any of the criteria for downlisting or delisting. With consistently low recruitment for several decades, the wild adult population now primarily consisted of older fish which are beginning to age out, resulting in an annual three percent population decline. While some hatchery reared individuals should be reaching sexual maturity and begin contributing to the adult population it will take several years to be able to observe changes in recruitment or population growth (Hardy et al. 2020). Natural recruitment is currently not enough to sustain or restore the population, with the juvenile and early life stage population largely supplemented by hatchery releases (KTOI 2023). KWRS should remain listed as endangered as it still relies on conservation efforts to sustain its population.

3.0 RESULTS

3.1 Recommended Classification:

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

3.2 New Recovery Priority Number:

Not Applicable

4.0 RECOMMENDATIONS FOR FUTURE ACTIONS

1. **Continue to implement the conservation aquaculture program.**

   KTOI has annually released hatchery-reared juvenile and early life stage KRWS to mitigate the low natural recruitment in the river. The Recovery Team continues to work together to introduce healthy and genetically diverse family groups into the river ecosystem. At the time of this review, KTOI has submitted a request to renew their Section 10 Recovery Permit with additions, including a proposal to remove in-river hatchery origin 12N sturgeon (KTOI 2023). Due to the continued low natural recruitment in the river and need to maintain a healthy, genetically diverse population it is recommended that the conservation aquaculture program continue for the benefit of the species.

2. **Continue to manage flow and temperature from Libby Dam and ensure spawning and rearing conditions are appropriate.**

   The construction of Libby Dam has permanently altered the natural flow regime of the Kootenai River. Flows are annually managed to provide ecosystem function to bull trout, KRWS, and other species within the river. This includes providing peak flows to encourage movement of adult KRWS into spawning habitat. Research is ongoing to determine what timing and flow rates provide the best opportunity for sturgeon spawning. Flow and temperature management from Libby Dam should continue to maintain ecosystem function for sturgeon and other species within the river.

3. **Continue to add nutrients to the Kootenai ecosystem.**

   The Kootenai River ecosystem has been nutrient deficient due to natural phosphorus and nitrogen being trapped behind Libby Dam. The nutrient addition project should continue, to restore ecosystem functions that will benefit sturgeon and other species within the river.

4. **Continue to implement habitat restoration and enhancement projects in the Kootenai basin.**

   Alteration of stream flows has changed the sediment substrate of the Kootenai River. The majority of the river system is comprised of silty and sandy substrate; however, white sturgeon require gravely substrate for spawning activities. Additionally, development along the river has disconnected the Kootenai River from off-channel habitats, thereby reducing habitat availability and ecosystem functions. For over a decade the Recovery Team has participated in restoration projects to restore gravel substrates, reconnect floodplains and channels, reduce streambank erosion, and other projects aimed to benefit sturgeon recovery. These projects should continue to provide suitable habitat for sturgeon and benefit the river system.

5. **Support KRWS recovery efforts with research and monitoring that will inform adaptive management.**

   Additional research and monitoring are required to determine limiting factors in sturgeon recovery. Many unknown variables still exist, particularly in early life stage survival. Several proposals (i.e. the KTOI proposal) and research projects are ongoing, but it may take several years to collect empirical data and monitor effectiveness. Results from these proposals and research projects help to inform recovery actions. Recovery actions are based on existing and new information and conditions and require continuing research to ensure positive adaptive management.

5.0 REFERENCES

66 FR 46548. 2001. U.S. Fish and Wildlife Service. Endangered and Threatened Wildlife and Plants; Critical Habitat Revised Designation for the Kootenai River Population of the White Sturgeon. September 6, 2001. Federal Register 66:46548-46561.

73 FR 39506. 2008. U.S. Fish and Wildlife Service. Endangered and Threatened Wildlife and Plants; Critical Habitat Revised Designation for the Kootenai River Population of the White Sturgeon (*Acipenser transmotanus*). July 9, 2008. Federal Register 73:39506-39523.

Flory, J.E. 2011. Status Review for Kootenai River White Sturgeon (*Acipenser transmontanus*) U.S. Fish and Wildlife Service, Region 1, Spokane WA. 26 pp.

Flory, J.E. 2018. Status Review for Kootenai River White Sturgeon (*Acipenser transmontanus*) U.S. Fish and Wildlife Service, Region 1, Spokane WA. 6 pp.

Hardy et al. 2020. Report for 5/1/2017 - 4/30/2019. Annual Report, 1988-065-00.

IDFG (Idaho Fish and Game). 2021. Population Trend Modeling (Unpublished).

KTOI (Kootenai Tribe of Idaho). 2023. Hatchery Management Plan Supporting Kootenai River White Sturgeon Restoration. Prepared for the Kootenai Tribe of Idaho by S. Young and N. Jensen. Edited by Meridian Environmental, Inc. (J. Heltzel and R. Rice). 80 pp.

NMFS (National Marine Fisheries Service). 2020. Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response. Continued Operation and Maintenance of the Columbia River System. National Oceanic and Atmospheric Administration, Portland, Oregon. 1496 pp.

Rust et al. 2007. Report for 4/1/2005 - 5/31/2006. Annual Report, 1988-065-00.

USACE (U.S. Army Corps of Engineers). 2024. Flow Plan Implementation Protocol Technical Team. FPIP Flow Plan for 2024 Sturgeon Operations at Libby Dam. U.S. Army Corps of Engineers, Seattle, Washington. 10 pp.

USFWS (U.S. Fish and Wildlife Service). 2006. The Effects of Libby Dam Operations on the Kootenai River White Surgeon, Bull Trout, and Kootenai Sturgeon Critical Habitat. U.S. Fish and Wildlife Service, Portland, Oregon. 153 pp.

USFWS (U.S. Fish and Wildlife Service). 2019. Revised Recovery Plan for the Kootenai River Distinct Population Segment of the White Sturgeon. U.S. Fish and Wildlife Service, Portland, Oregon. 35 pp.

U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW of Kootenai River White Sturgeon (*Acipenser transmontanus*)

Current Classification: Endangered

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: Ahren Ramirez, Idaho Fish and Wildlife Office, Coeur d'Alene, ID

FIELD OFFICE APPROVAL:

State Supervisor, Idaho Fish and Wildlife Service

Approve LISA ELLIS Digitally signed by LISA ELLIS Date: 2024.08.16 17:44:00 -06'00' Date _August 16, 2024_____