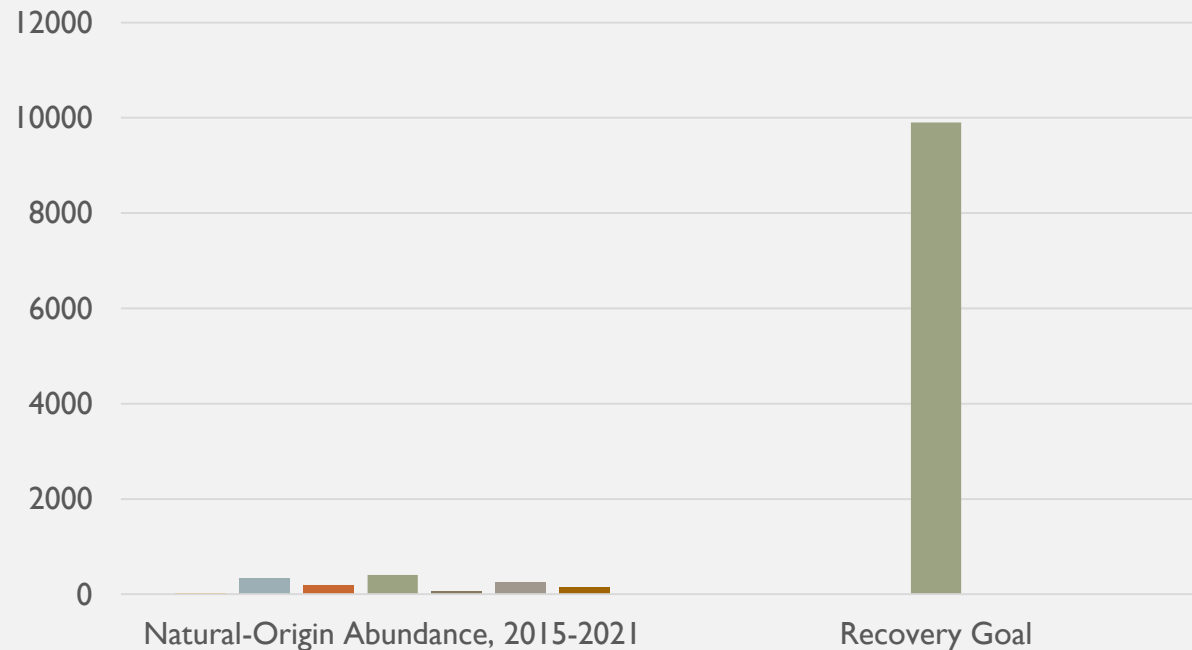


## SOUTH FORK NOOKSACK CHINOOK ARE IMPORTANT BUT FAR FROM RECOVERY

South Fork Nooksack Chinook NOR Spawners relative to Recovery Goal



- Nooksack Early Chinook are essential for recovery
- Average recent abundance is 2% of our recovery goal.

# SF CHINOOK ARE DYING BEFORE THEY CAN SPAWN

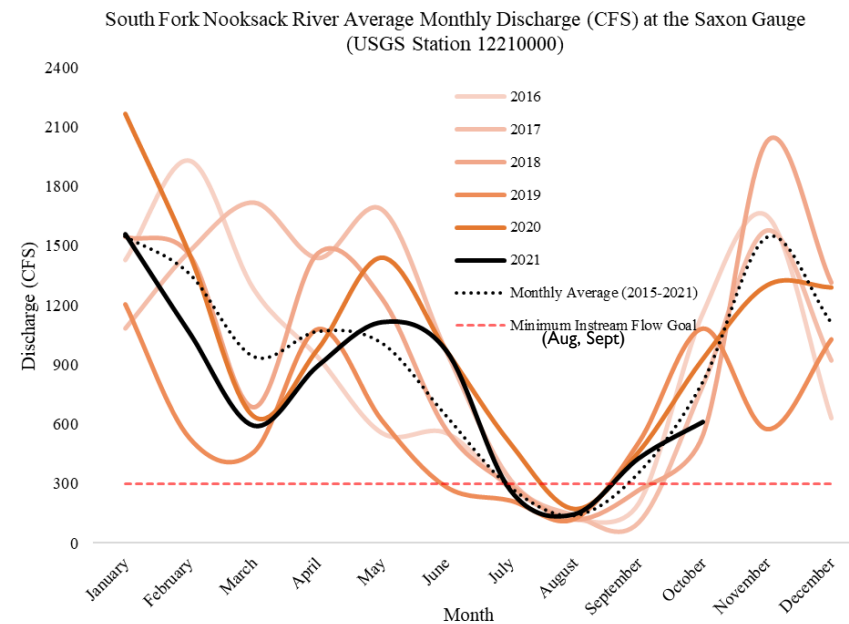
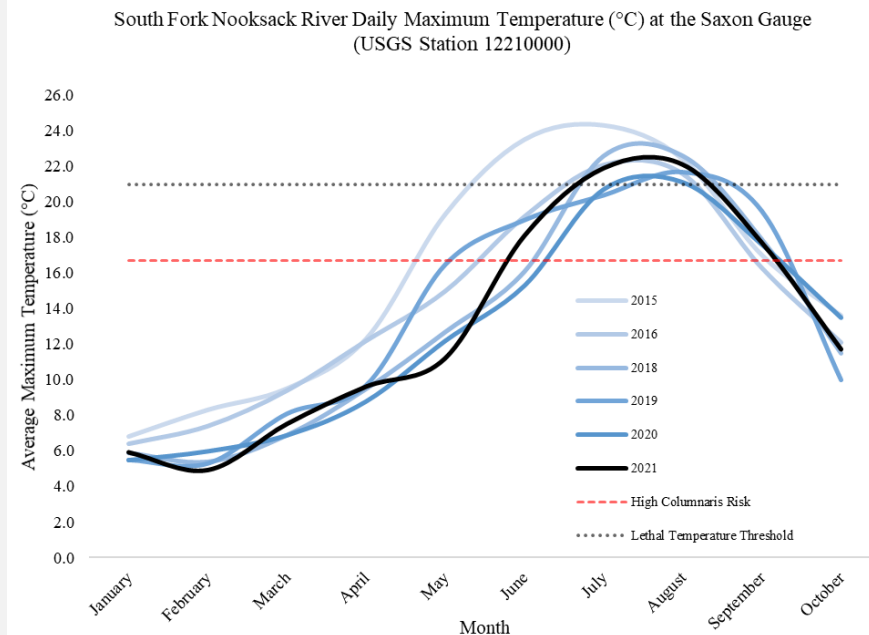


Photo Credit: Lummi Natural Resources

- Summer 2021
  - Over 2400 Chinook died in the South Fork before they could spawn including
    - **43 Wild Chinook (31% of SF returns)**
- Summer 2022
  - Lower, but still significant, numbers of pre-spawn mortalities

# HIGH TEMPERATURE, LOW FLOWS, DEGRADED HABITAT ARE TO BLAME

- Direct cause: 3 pathogens with temperature-related virulence (severity)
- Underlying causes: high temperatures, low flows, and degraded habitat
- We are working to address the underlying causes with restoration, but that will take time



# STUDIES INDICATE RECREATION HAS NEGATIVE IMPACTS ON CHINOOK

Effects of temperature, flow,  
and disturbance on adult  
spring-run chinook salmon

University of California  
Water Resources Center  
Technical Completion Report  
August 31, 1992

#### Investigators:

Elizabeth A. Campbell and Peter B. Moyle  
Department of Wildlife & Fisheries Biology  
University of California  
Davis, California 95616

(916) 752-0205 and (916) 752-6355



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL MARINE FISHERIES SERVICE  
West Coast Region  
1201 NE Lloyd Boulevard, Suite 1100  
Portland, Oregon 97232-1274

Refer to NMFS No. WCRO-2022-00867

July 22, 2022

<https://doi.org/10.25923/40ty-4162>

Charles Mark  
Forest Supervisor  
Salmon-Challis National Forest  
1206 S. Challis Road  
Salmon, Idaho 83467

Re: Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson-Stevens  
Fishery Conservation and Management Act Essential Fish Habitat Response for the  
Middle Fork Salmon River Recreational Floating Activities, Upper Middle Fork Salmon  
River, 17060205; Lower Middle Fork Salmon River, 17060206; Middle Salmon-  
Chamberlain, 17060207, Custer and Lemhi Counties, Idaho

Dear Mr. Mark:

Thank you for your email dated March 30, 2022, requesting initiation of consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 et seq.) for Middle Fork Salmon River Recreational Floating Activities. Thank you, also, for your request for consultation pursuant to the essential fish habitat (EFH) provisions in Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act [16 U.S.C. 1855(b)] for this action. However, after reviewing the proposed action, we concluded that there are no adverse effects on EFH. Therefore, we are hereby concluding EFH consultation.

On July 5, 2022, the United States District Court for the Northern District of California issued an order vacating the 2019 regulations adopting changes to 50 CFR part 402 (84 FR 44976, August 27, 2019). This consultation was initiated when the 2019 regulations were still in effect. As reflected in this document, we are now applying the section 7 regulations that governed prior to adoption of the 2019 regulations. For purposes of this consultation, we considered whether the substantive analysis and its conclusions regarding the effects of the proposed actions articulated in the biological opinion and incidental take statement would be any different under the 2019 regulations. We have determined that our analysis and conclusions would not be any different.

In this biological opinion (opinion), NMFS concludes that the action, as proposed, is not likely to jeopardize the continued existence of Snake River spring/summer Chinook salmon. NMFS also concurs with the Salmon-Challis National Forest (SCNF) determination that the proposed action may affect, but is not likely to adversely affect Snake River sockeye salmon, Snake River Basin



#### AN ABSTRACT OF THE THESIS OF

Katherine Carey for the degree of Master of Science in Fisheries Science presented on November 8, 2022.

Title: Prespawning Mortality of Fall Creek Willamette Chinook Salmon (*Oncorhynchus tshawytscha*): Evaluation of the Effects of a New Trap at the Adult Fish Collection Facility

Abstract approved:

James T. Peterson

#### ABSTRACT

Annual rates of prespawn mortality (PSM) in adult Chinook salmon (*Oncorhynchus tshawytscha*) trapped and transported upstream of dams in the Willamette River basin are high (often >40%) and could limit the ability to restore natural populations of spring Chinook salmon if not reduced. Improvements at the U.S. Army Corps of Engineers trapping facilities at Fall Creek represent opportunities to evaluate the effects of facility improvement on PSM, since historic rates have been relatively high in this system. Results will likely be transferable to other Willamette Basin reintroduction programs to help reduce PSM. Prespawn mortality was evaluated in Fall Creek in summer and fall of 2020-2021, and the rates were compared to those observed prior to improvements of the trapping and transport facilities in 2010-2017. Field necropsies were performed on dead salmon detected during daily surveys, and the tissues were brought back to the lab for histopathological evaluation. Prespawn mortality was estimated using a novel integrated Bayesian model and our 2020 estimate was among the highest of the pre-trap improvement period. Exploratory analyses were used to evaluate relationships between PSM and stream temperatures and discharge. Results suggested a strong correlation ( $r=0.94$ ) between PSM and maximum daily temperatures below Fall

## 2005 SALMON RECOVERY PLAN IDENTIFIED RECREATION IN LOWER SF AS A LIMITING FACTOR

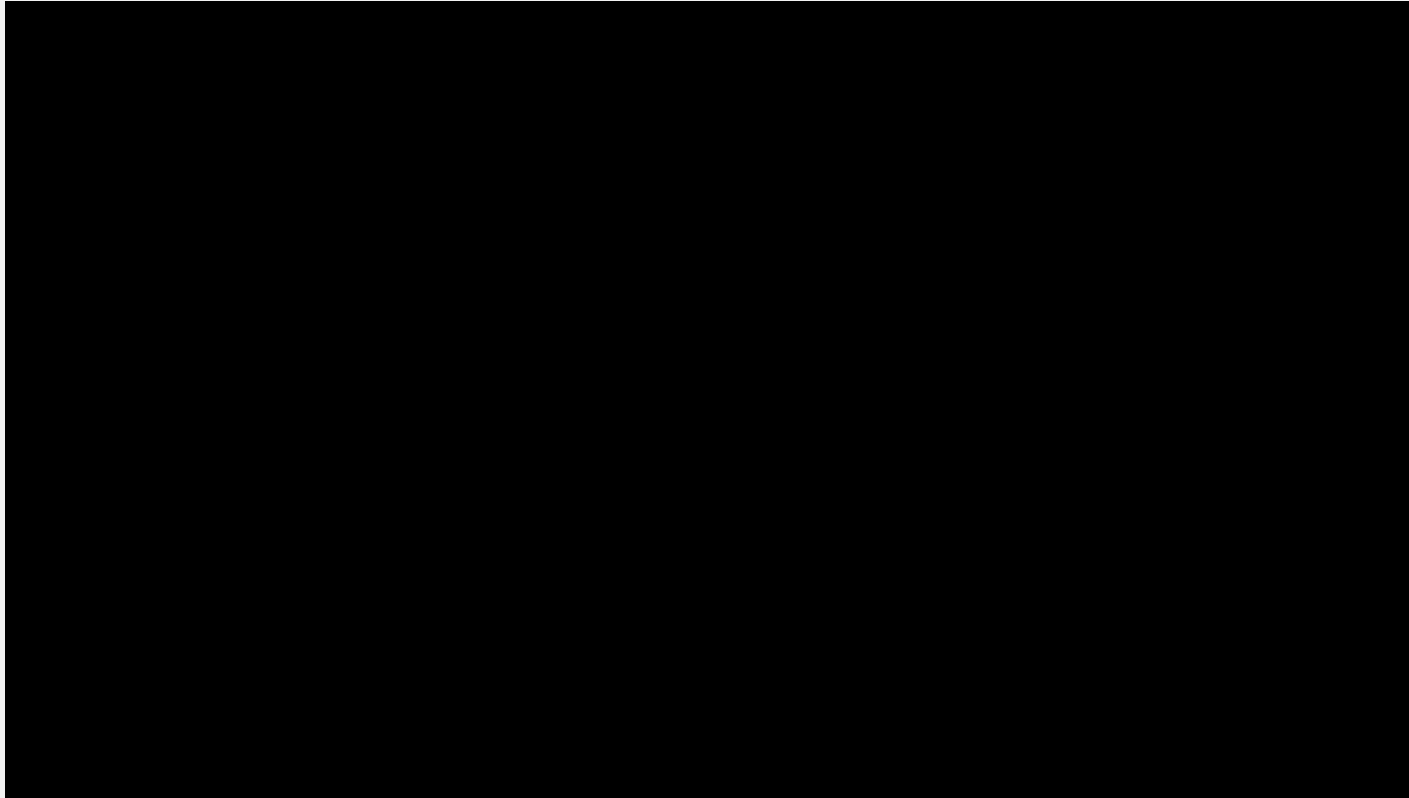


Photo Credit: Bellingham Herald

**Stress is cumulative – the greater the stress, the higher the risk of prespawn mortality!**

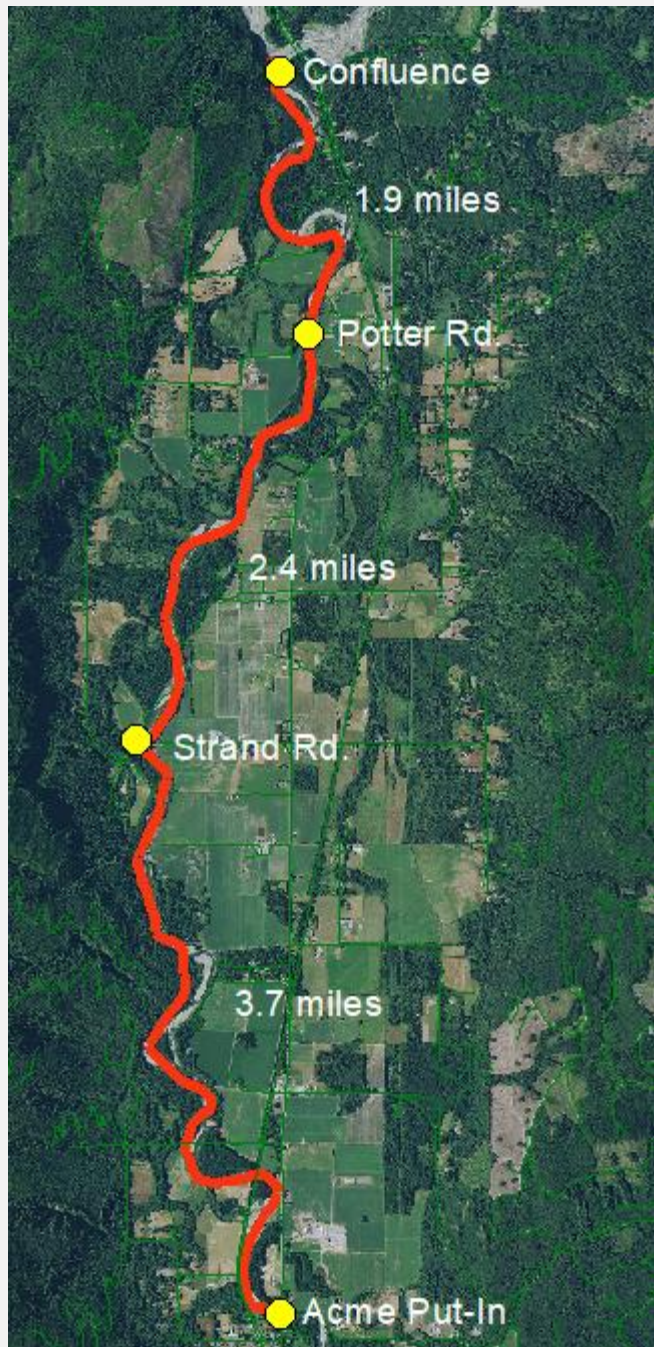
- 2005 *Salmonid Recovery Plan* identified recreation in lower South Fork as a **limiting factor**:
  - *Harassment elicits avoidance behavior in upstream migrating, holding, and spawning chinook, which can use up limited energy stores or otherwise stress the fish and thereby reduce reproductive success.*
  - *Redd trampling, which reduces survival to emergence, is also likely.*
  - *Summer recreational use of the lower South Fork, especially inner tubing, increases human-chinook encounters, thereby stressing holding and spawning chinook.*

## CHINOOK STARTLE EASILY



- Chinook responding to a swimmer floating over a log jam-formed pool
- Startling increases stress and avoidance uses up limited energy reserves

Video taken recently in South Fork Nooksack River



**UNLIKE OTHER RECREATION,  
TUBING IMPACT IS  
DISTRIBUTED**

- Tuber put-in
  - Generally Acme area
- Tuber take-out
  - Strand Rd. (3.7 miles total length)
  - Potter Rd. (6.1 miles total length)
  - Confluence (8 miles total length)

# TUBING HAS A SIGNIFICANT CUMULATIVE IMPACT

INDIVIDUAL  
STARTLE  
RESPONSE

×

NUMBER OF  
STARTLES

×

NUMBER OF  
TUBERS

=

CUMULATIVE  
STRESS/ENERGY  
EXPENDITURE

Floating over  
fish elicits a  
startle  
response

Number of fish  
encountered by  
a tuber is  
related to  
length they  
float

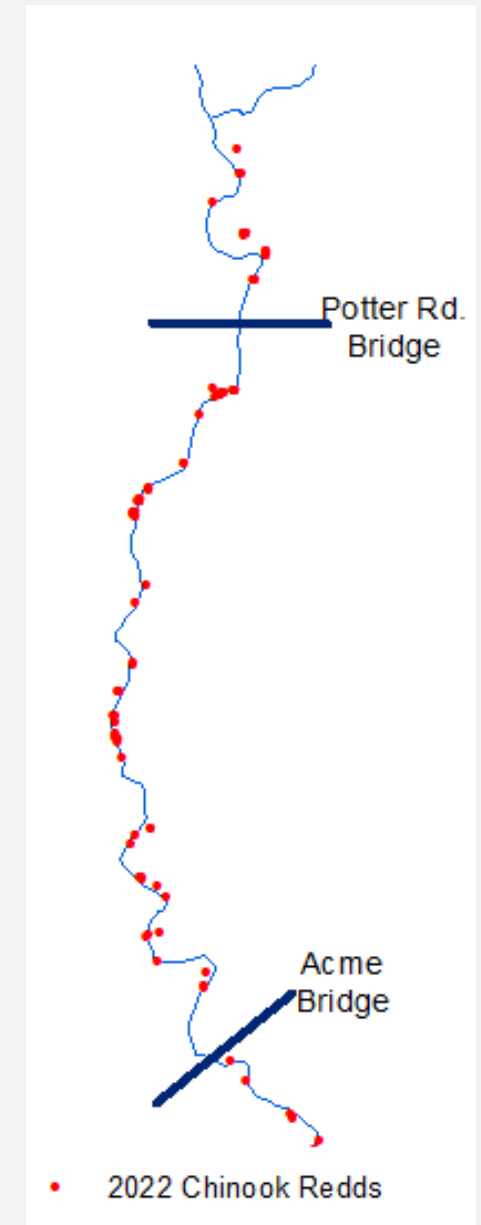
Number of  
tubers any year  
may vary, but  
estimated # of  
tubers on hot  
days is several  
hundred to  
1000

Considerable  
increase in stress,  
energy  
expenditure that  
**poses**  
**unacceptable**  
**risk** to this  
valued, imperiled  
resource



## HIGH RISK OF REDD TRAMPLING

- South Fork Chinook spawn throughout the lower South Fork
- 71 Chinook redds documented between Acme and Potter Rd. bridge in 2022
- Salmon eggs are very sensitive – in the first days, even a slight disturbance in the streambed can be fatal





## SUMMARY

- SF Chinook are in crisis
- Tubing has a high potential for impact that poses **unacceptable additional risk** to SF Chinook.
- South Fork is a priority for restoration
  - Improving habitat conditions for fish worsens conditions for people
- Recreation can move elsewhere – our salmon cannot.