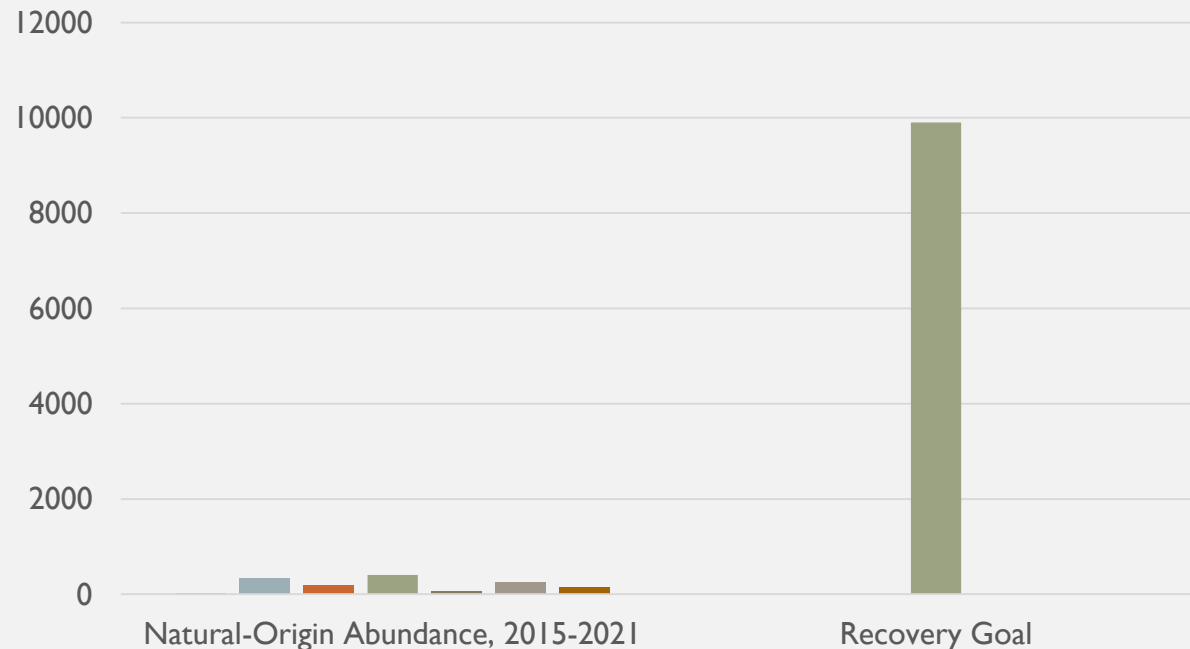


SOUTH FORK NOOKSACK CHINOOK ARE IMPORTANT BUT FAR FROM RECOVERY

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

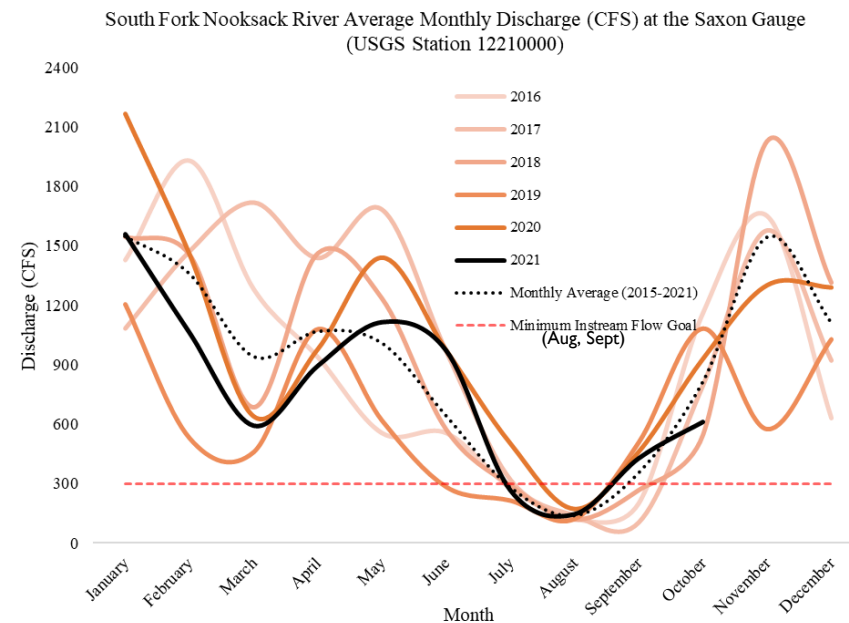
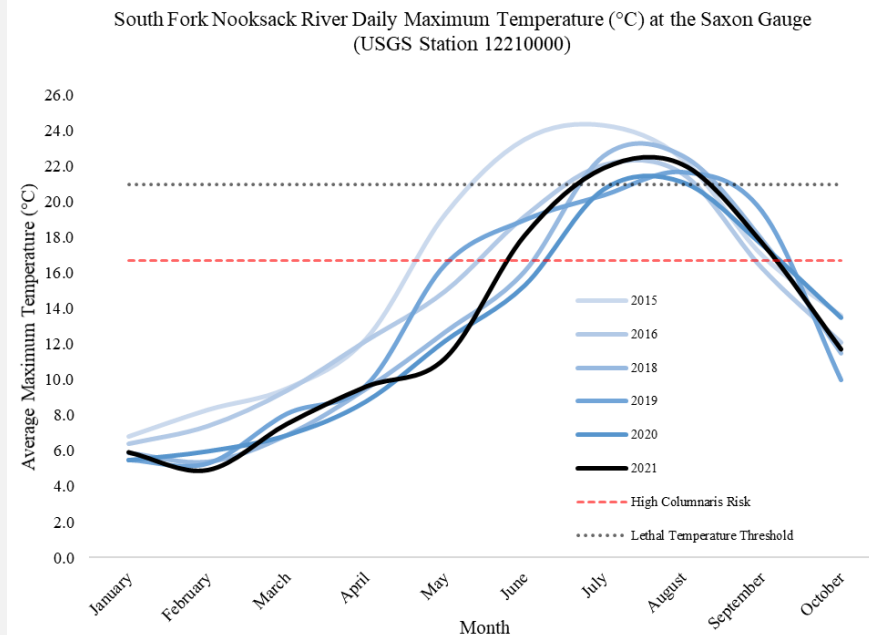


Photo Credit: Lummi Natural Resources

- 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

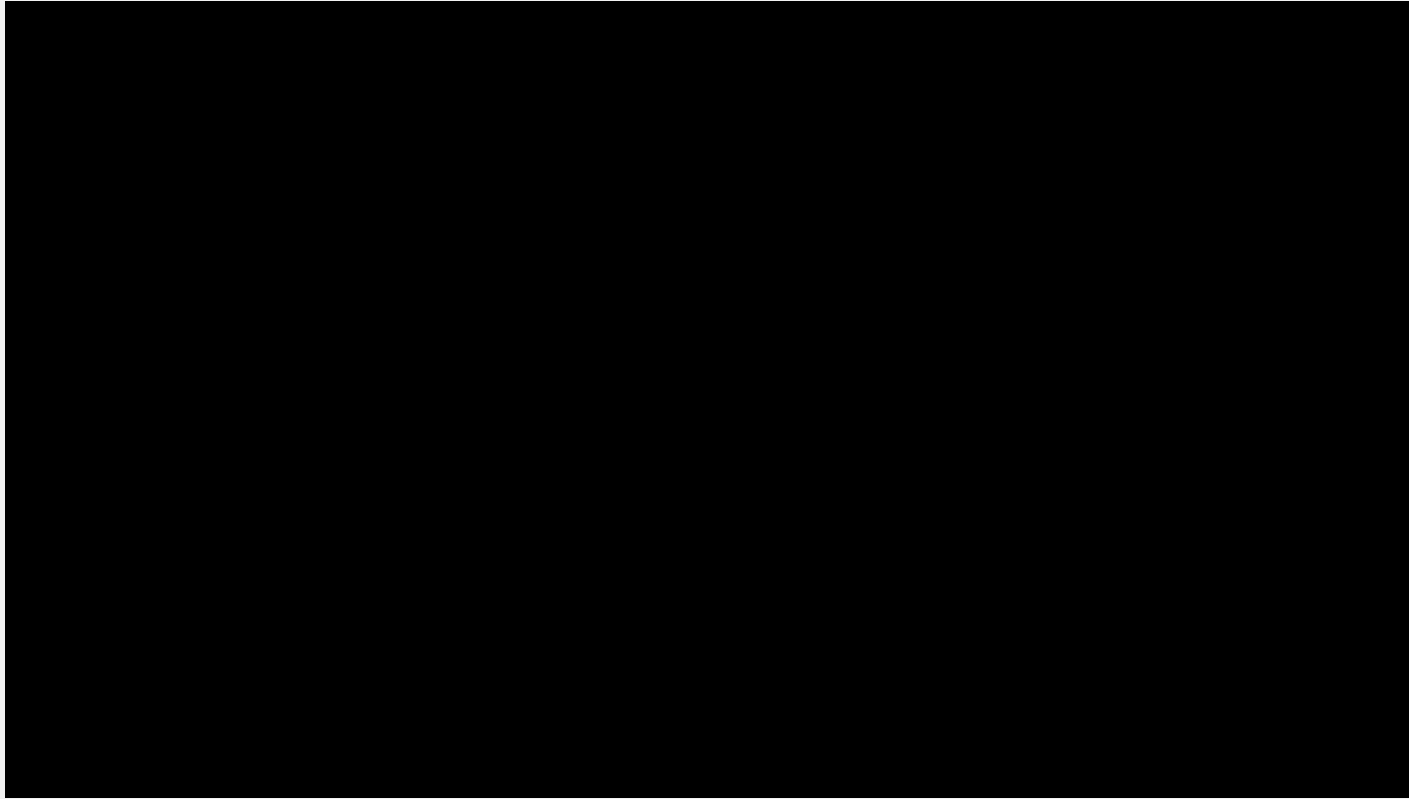


Photo Credit: Bellingham Herald

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

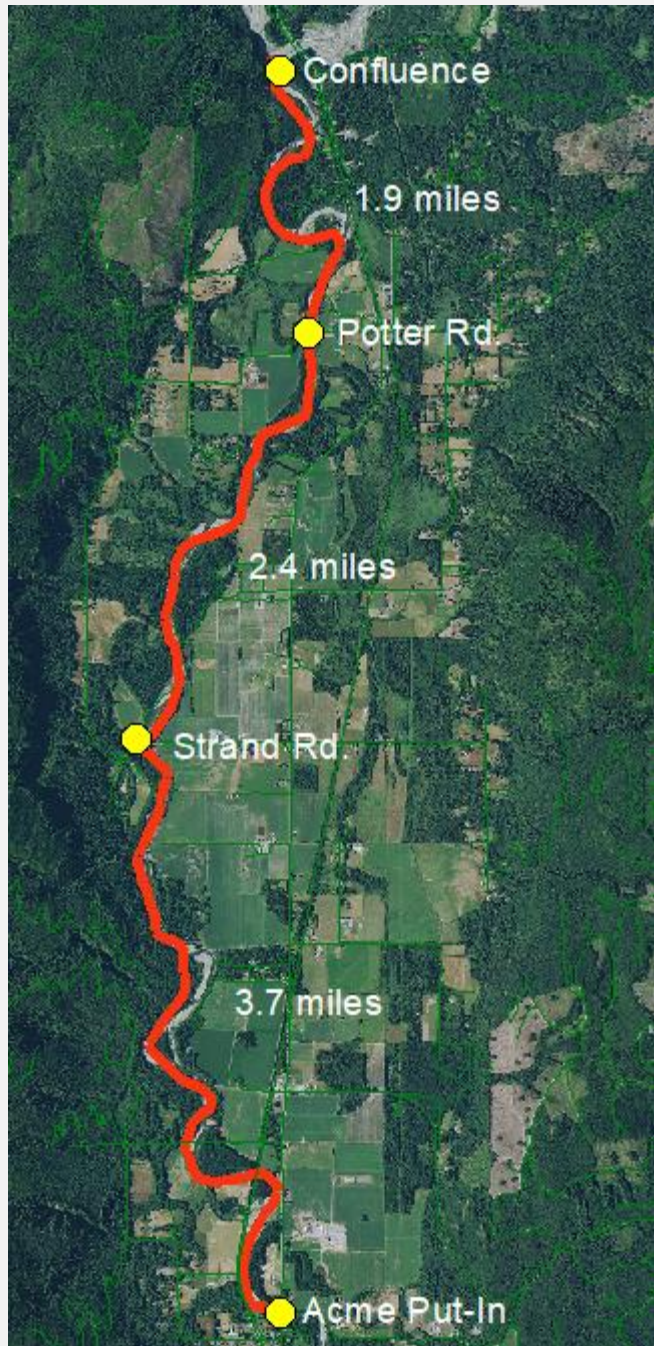
- 2005 *Salmonid Recovery Plan* identified recreation in lower South Fork as a **limiting factor**:
 - Harassment elicits **avoidance behavior** in upstream migrating, holding, and spawning chinook, which can **use up limited energy stores or otherwise stress the fish and thereby reduce reproductive 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

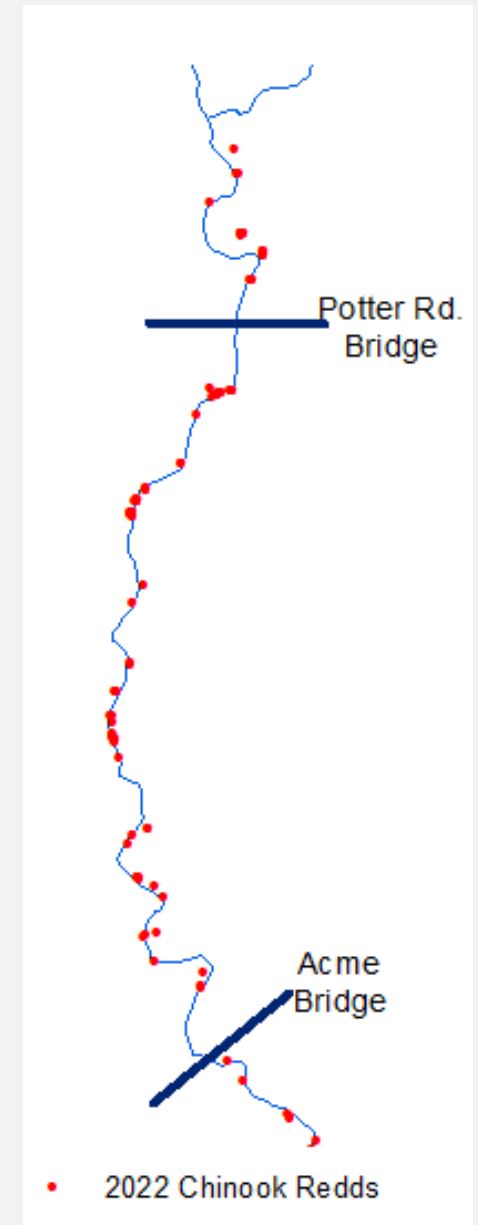
Number of fish
encountered by
a tuber is
related to
length they
float

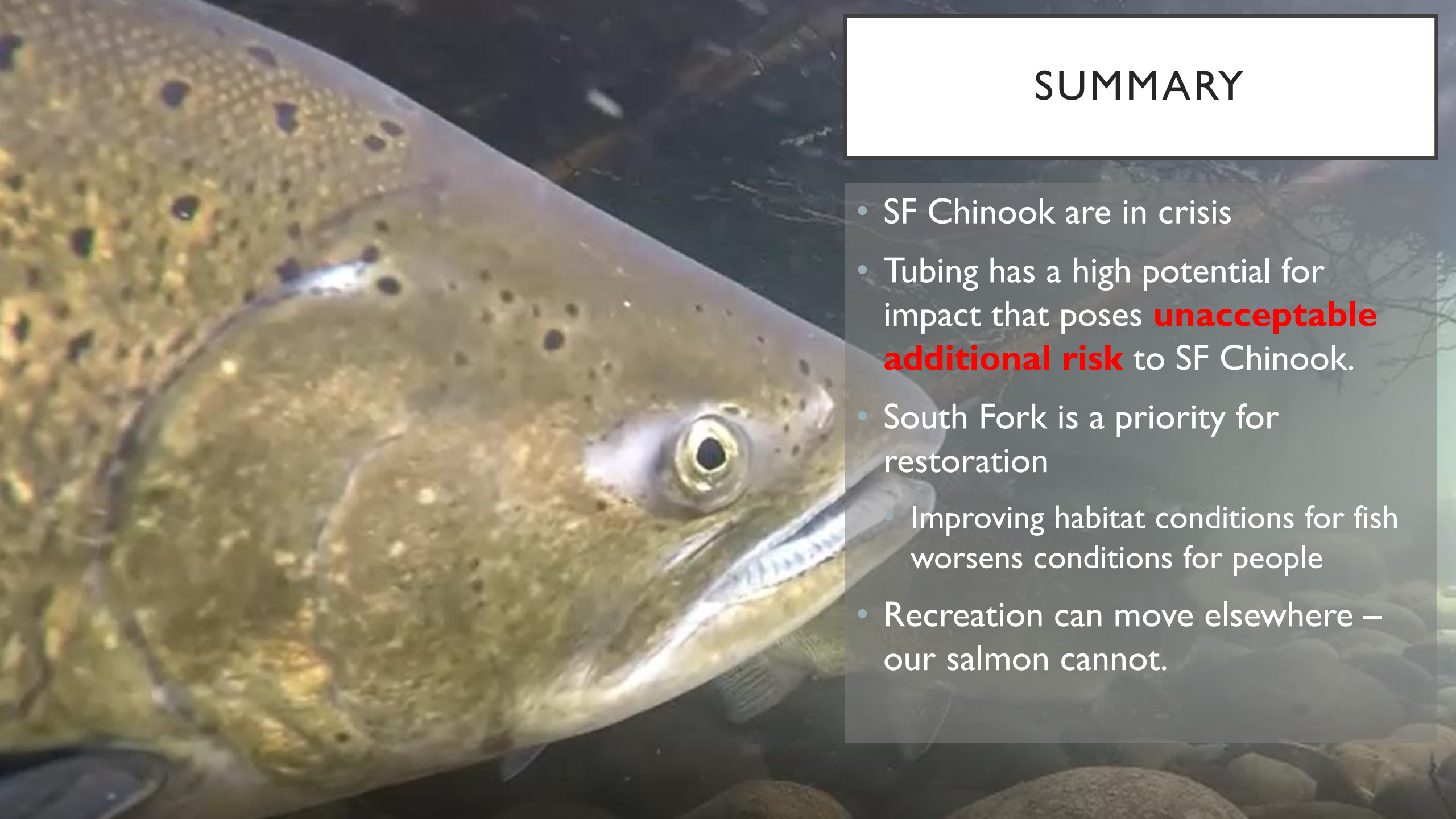
Number of
tubers any year
may vary, but
estimated # of
tubers on hot
days is several
hundred to
1000

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.