



# Annual Fisheries Report 2023



# TABLE OF CONTENTS

INTRODUCTION.....	3
SALMONID LIFE CYCLE MONITORING.....	3
REFERENCES.....	8

## INTRODUCTION

This report summarizes fisheries work conducted by the Mendocino and Humboldt Redwood Companies (MRC/HRC) Forest Sciences Department in 2023. Data from previous years is also presented.

Our major project for 2023 was the operation of a salmonid life cycle monitoring station in the North Fork Navarro River.

## SALMONID LIFE CYCLE MONITORING

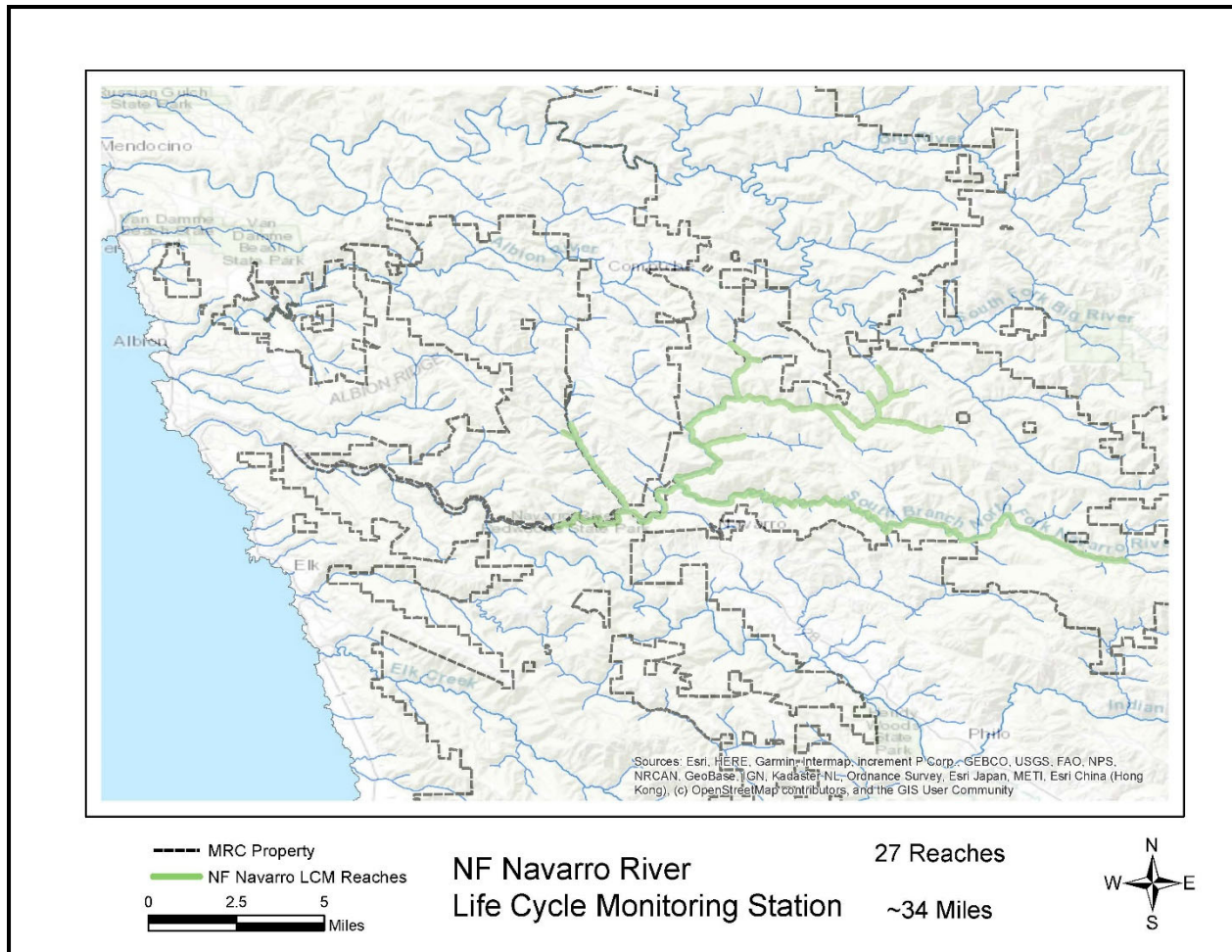
In 2013 MRC entered a partnership with California Department of Fish and Wildlife (CDFW) and Pacific States Marine Fisheries Commission to operate a life cycle monitoring (LCM) stream in the North Fork Navarro River as part of the California Coastal Salmonid Monitoring Program (CMP). The goal of the CMP and associated LCM streams is to estimate the number of adult steelhead, Chinook and coho salmon returning to the Mendocino County coastal region annually and monitor their numbers over an extended period of time to help understand regional population trends.

For more information about the CMP, visit the CDFW website:  
<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=78444>

The operation of an LCM station requires survey methods that focus on the multiple life stages of salmon and steelhead trout. The two main surveys employed by MRC are 1) spawning surveys to estimate the number of adults returning from the ocean, and 2) downstream migrant trapping to estimate the number of juvenile salmonids leaving the streams heading towards the ocean. With these two population estimates we can gather information about ocean and in-stream survival of these species.

## METHODS

Spawning surveys were conducted bi-weekly on 27 stream segments ranging from 0.5 to 3 kilometers in length throughout North Fork Navarro River from December 15, 2022 through May 17, 2023 (Figure 1). MRC Biologists hiked these segments searching for redds (salmonid nests), live adult salmonids, and carcasses. Data collected from observed adult fish included species, sex, length, and fish condition. Observed redds were flagged, GPS coordinates were recorded, redd dimensions were taken including pot and tail-spill area, and depth and redd substrate size (Gallagher et al. 2007). Population estimates are generated using repeated live-fish count estimation (Gallagher et al. 2010).



**Figure 1. Map showing North Fork Navarro River Life Cycle Monitoring Reaches.**

Downstream migrant trapping of juvenile coho salmon and steelhead trout in the North Fork Navarro River utilizes a rotary screw trap. The trap works by funneling fish into a live box located at the rear of the trap by a large rotating drum lined with steps similar to a corkscrew. Stream hydrology rotates the drum when there is normal to high flow conditions. When low flow conditions occur, a battery powered 12-volt DC motor rotates the drum through a chain driven system (Figure 2). Downstream migrant trapping in North Fork Navarro River started in 2014 and has continued every year except for 2019 due to loss of funding.

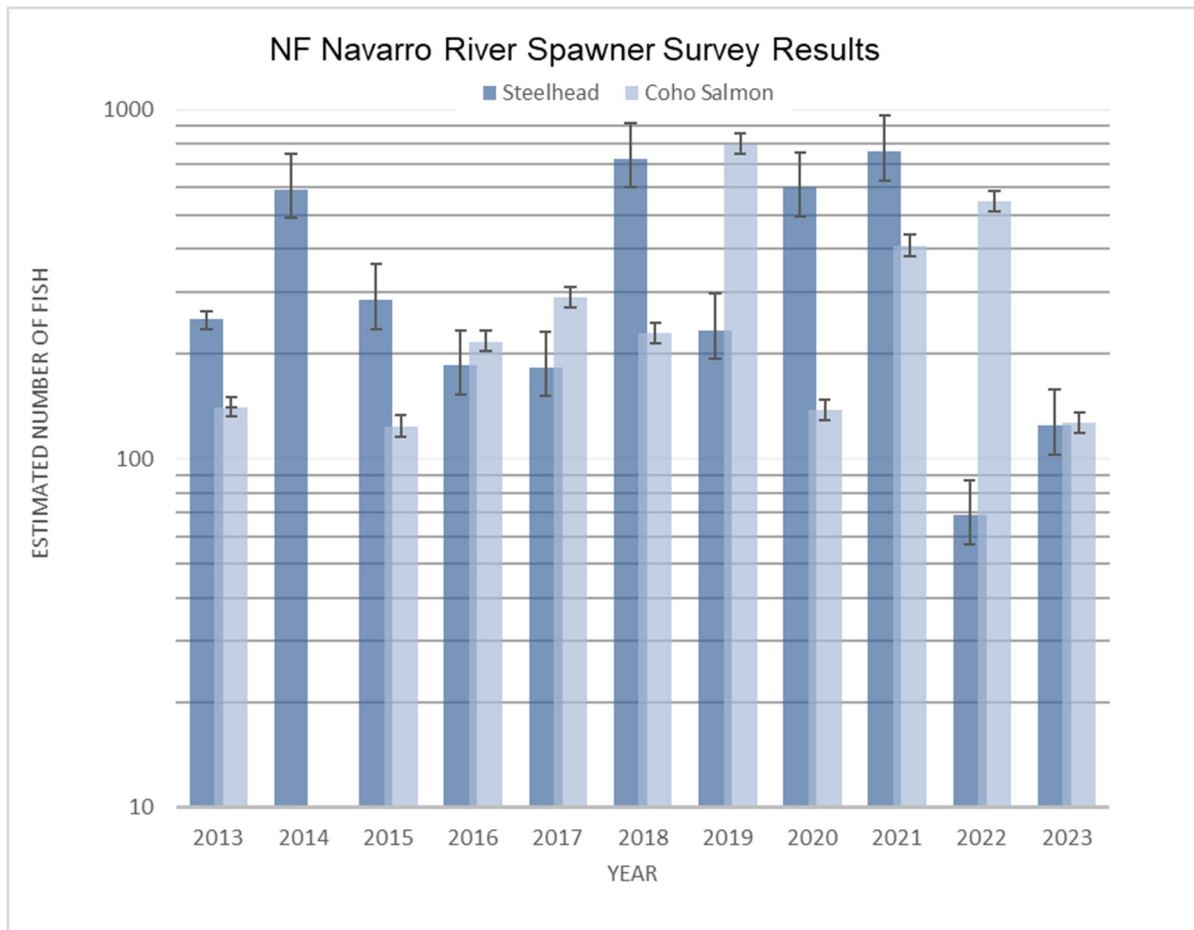
The trap is checked daily during the season and sometimes visited more than once a day if high amounts of fish are collected. Captured fish are anesthetized, identified by species, measured, and released downstream of the trap. A percentage of coho salmon smolts and steelhead trout age 1+ or greater are marked and released upstream of the trap. Population estimates are generated using mark and recapture methodology based on the total number of fish captured and the weekly recapture efficiency. This data is then analyzed with a statistical program called DARR v2.02 r (Bjorkstedt 2005).



**Figure 2. A motorized rotary screw trap in the North Fork Navarro River 2015.**

## RESULTS

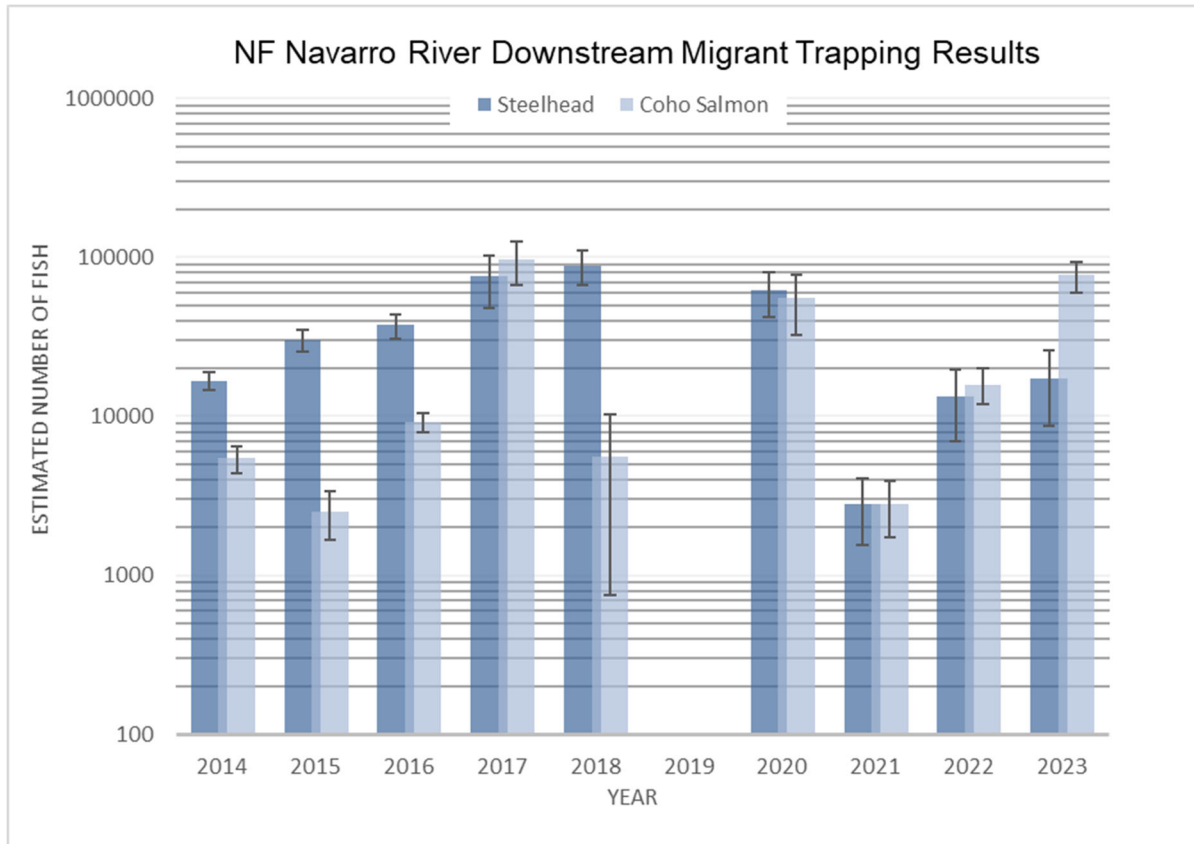
The 2023 spawning survey population estimates for the North Fork Navarro River were 127 coho salmon and 125 steelhead trout adults (Figure 3), there were an estimated 19 coho salmon and 66 steelhead trout redds. The absence of coho salmon adults in 2014 was a result of the lack of early winter rains that would typically open the sand bar where the Navarro River enters the ocean.



**Figure 3. Estimated number of coho salmon and steelhead trout adults showing the 95% confidence interval for water years 2013-2023 in North Fork Navarro River.**

The population estimate for the number of juvenile coho salmon migrating downstream during water year 2023 was estimated at 77,006 +/- 16,879 (Figure 2). A total of 3,399 juvenile coho salmon were captured ranging from 55 -149 mm in size. The weekly trapping efficiency (probability of capturing fish) ranged from 5-30% due to varying stream conditions and timing of migration.

The population estimate for the number of juvenile steelhead trout migrating downstream during water year 2023 was estimated at 17,273 +/- 8,550 (Figure 4). A total of 539 juvenile steelhead trout were captured ranging from 69-272 mm in size. The weekly trapping efficiency (probability of capturing fish) ranged from 3-5%.



**Figure 4. Estimated number of juvenile coho salmon and steelhead trout showing the 95% confidence interval for water years 2014-2023, excluding 2019, in North Fork Navarro River.**

## REFERENCES

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