



D. Killam/CDFW

Led Astray: Impacts of Drought on Fall Chinook Salmon at Coleman National Fish Hatchery

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U.S. Fish and Wildlife Service
Red Bluff Fish and Wildlife Office
December 5, 2017

Outline

What are the impacts of trucking fall Chinook Salmon off-site for release during the 2014-2015 drought?

- Background
- Trucking Fall Chinook Salmon
- Coleman NFH 2017 Production
 - Partnership with Nimbus Hatchery



S. Martarano/USFWS

Introduction

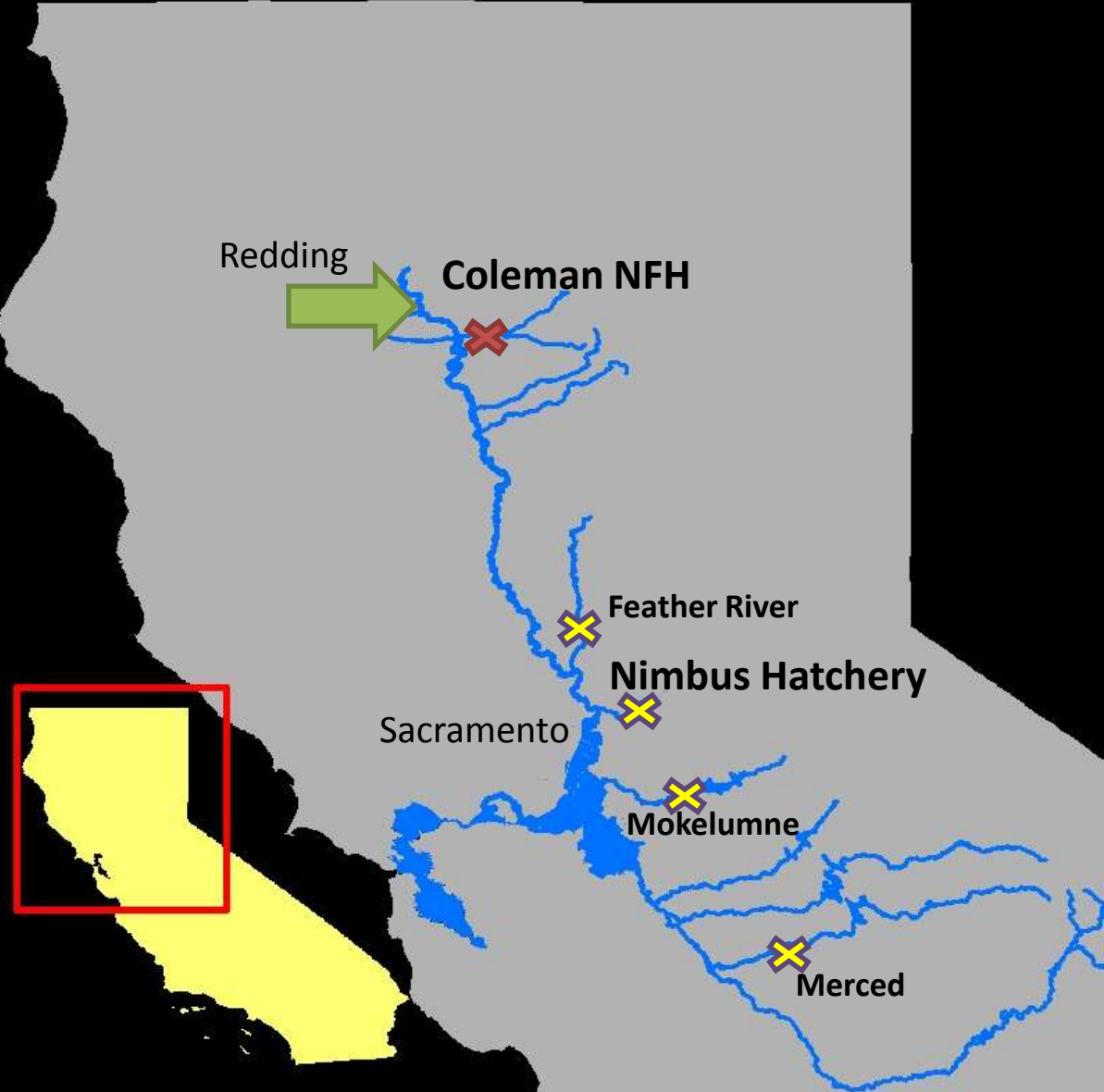
Where are we?



Introduction

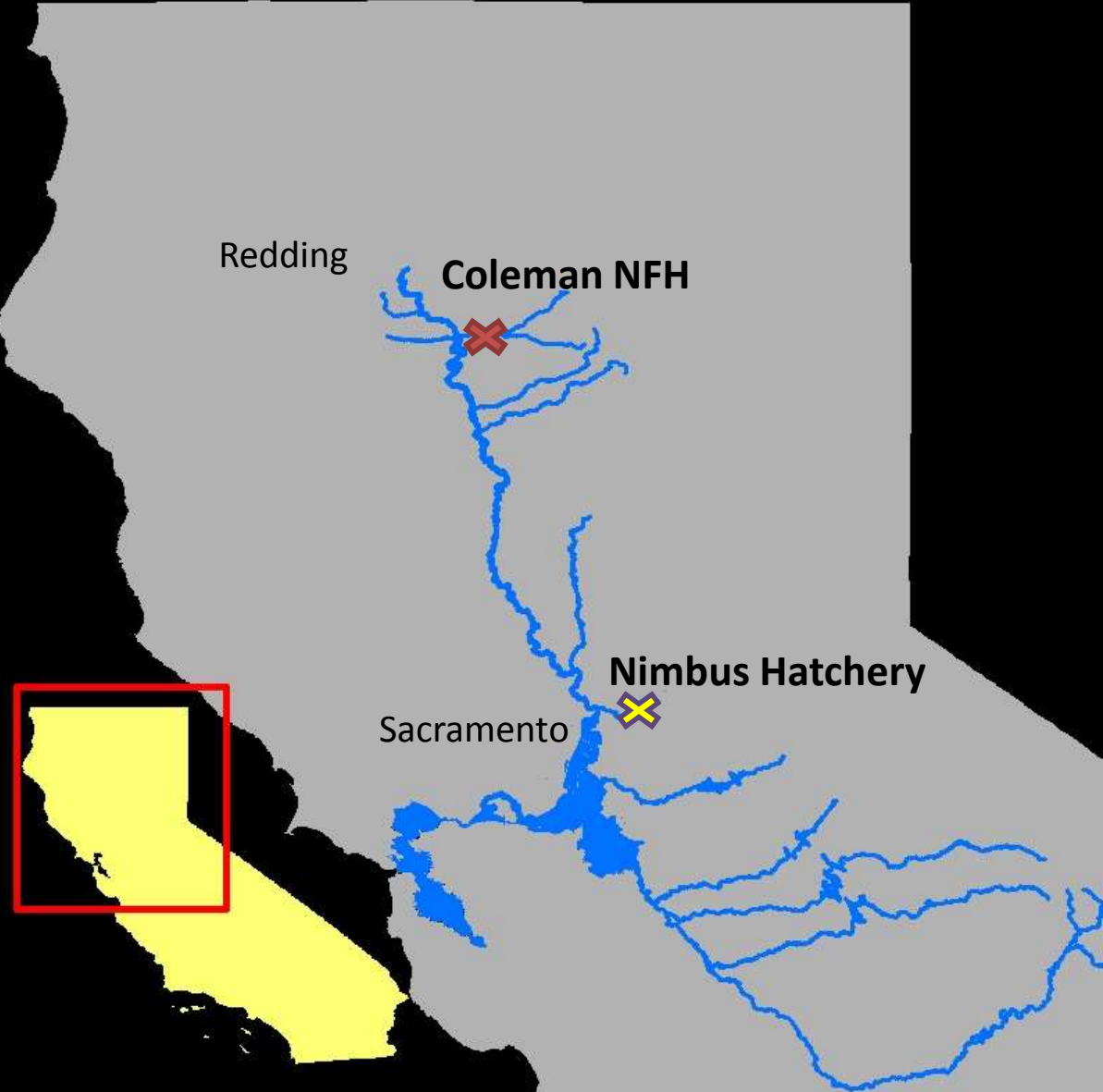
Central Valley Fall Chinook Salmon

- 5 Central Valley hatcheries
- 32 million FCS smolts
- 25% adipose fin clipped and tagged with CWT



Introduction

Central Valley Fall Chinook Salmon



Introduction

Coleman National Fish Hatchery

- 12 million fall Chinook Salmon smolts annually
- Goals
 - Ocean and freshwater fisheries
 - Broodstock for hatchery
 - Reduce impacts
- On-site release



Trucking Fall Chinook Salmon



Trucking Fall Chinook Salmon

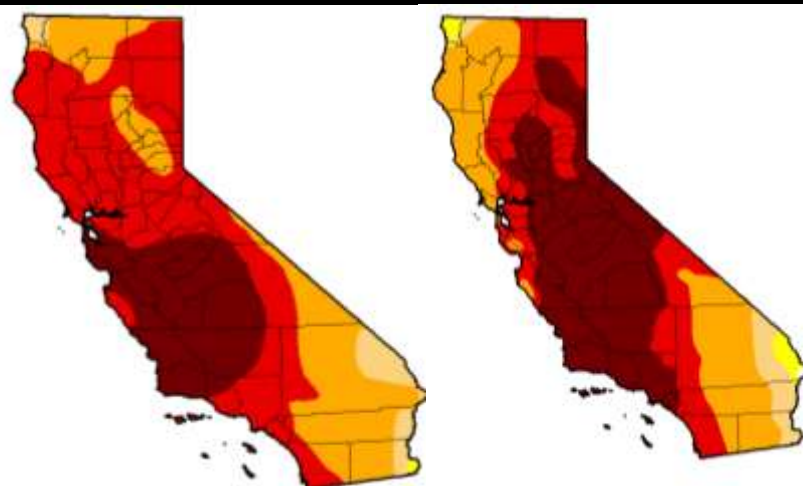
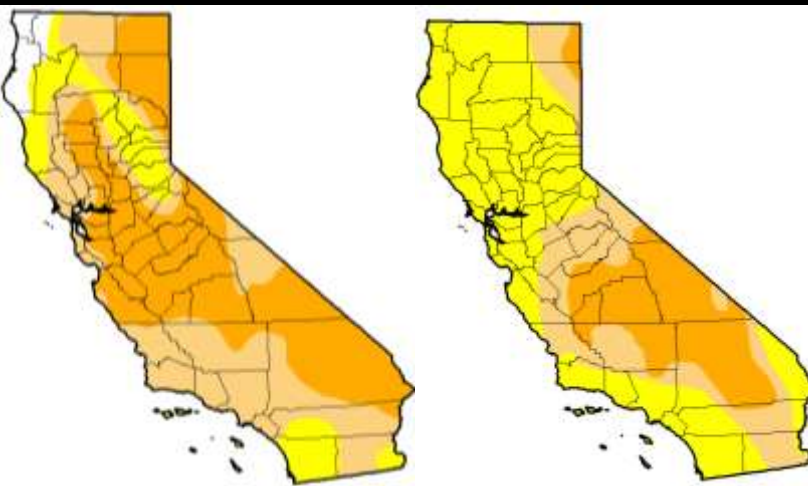
California's Drought

2012

2013

2014

2015



Legend:
Yellow: Moderate Drought
Orange: Moderate to Severe Drought
Red: Severe Drought
Dark Red: Extreme Drought
Black: Exceptional Drought

The Drought Watch focuses on broad-scale conditions. Local conditions may vary. Use accompanying text describing the forecast situation.

Author:
Lyn Combs
USDA Department of Agriculture

USDA
California Department of Water Resources
<http://droughtmonitor.unl.edu/>

First week April: near target release date for fall run

Trucking Fall Chinook Salmon

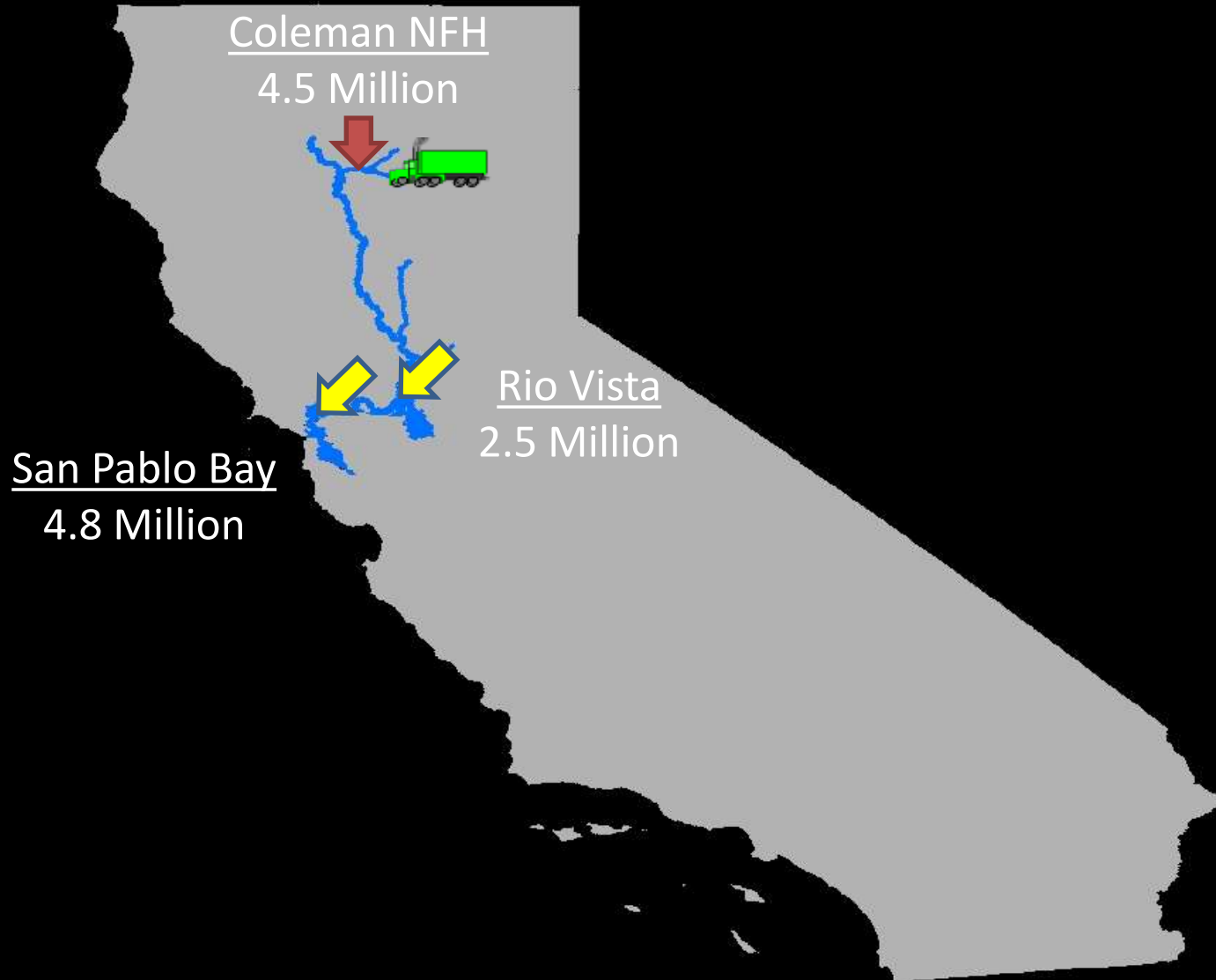
Decision to Truck



- Real-time decisions based on river conditions
- Environmental Thresholds
 - High temperature
 - Low river flows
- Delta Water Operations
- Degraded conditions through ~300 mile emigration corridor

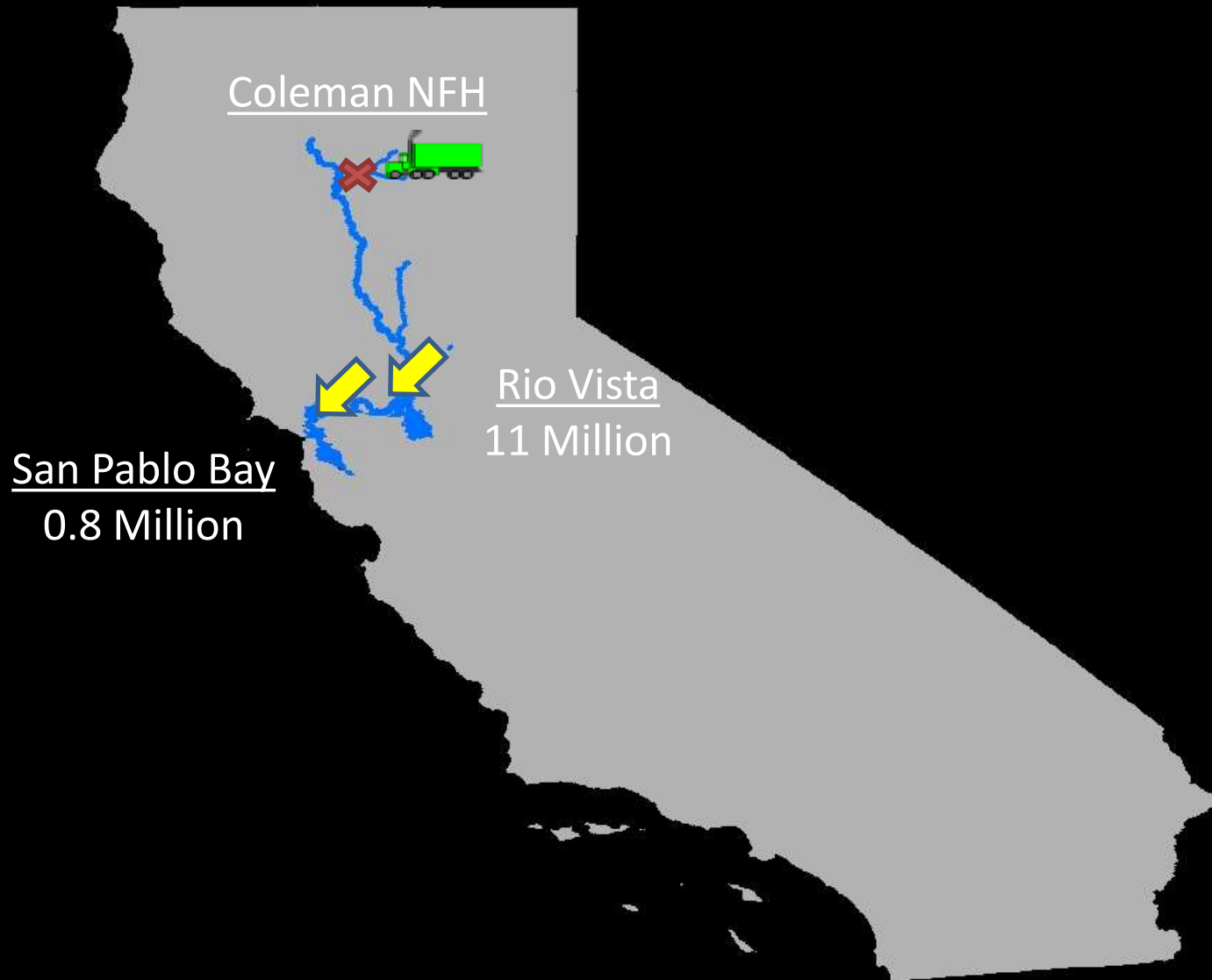
Trucking Fall Chinook Salmon

BY 2013 Releases



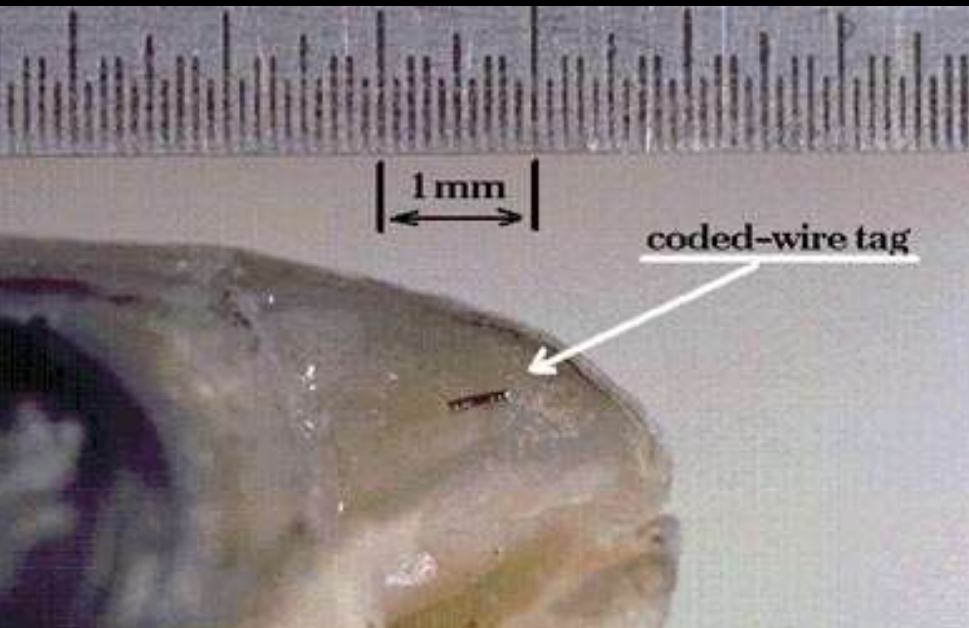
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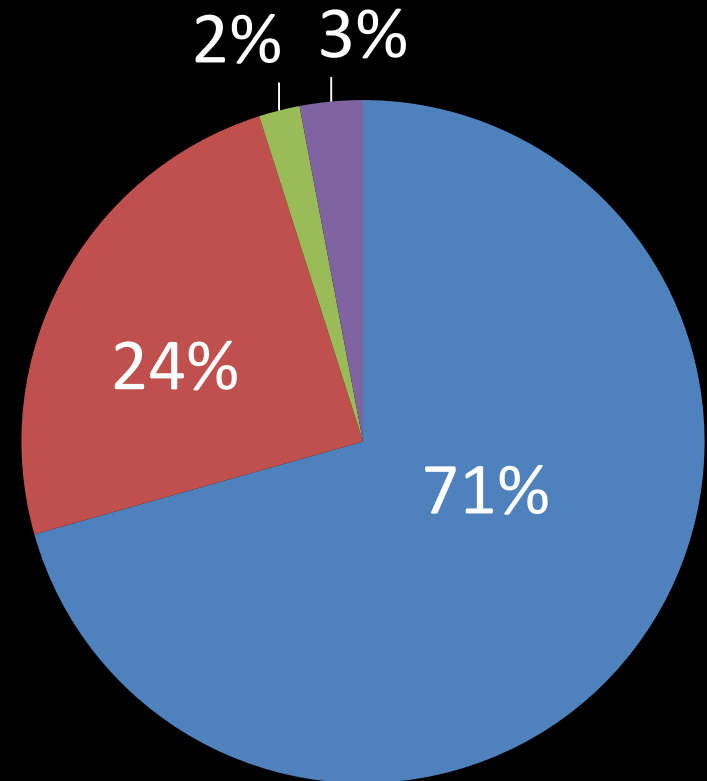
Trucking Fall Chinook Salmon

CWT Recoveries



Trucking Fall Chinook Salmon

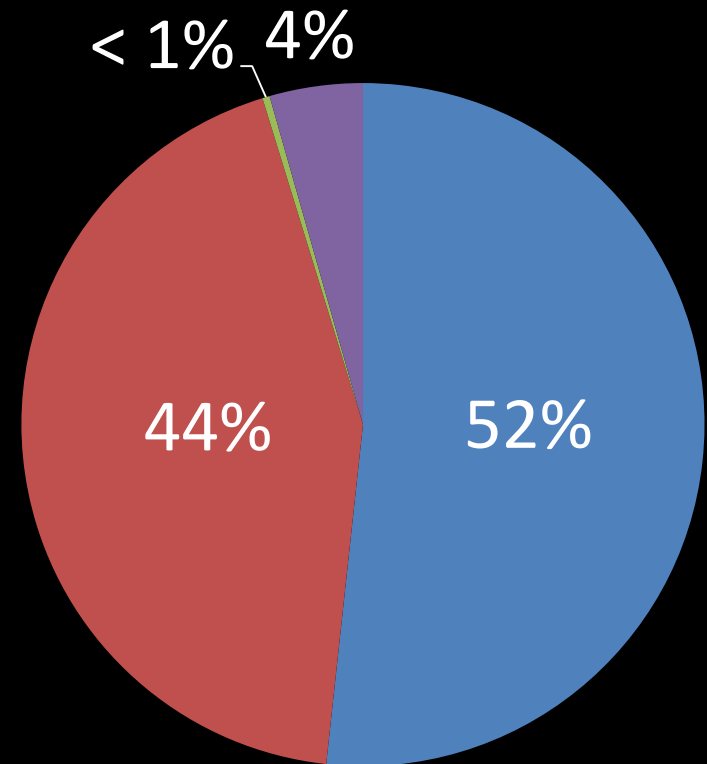
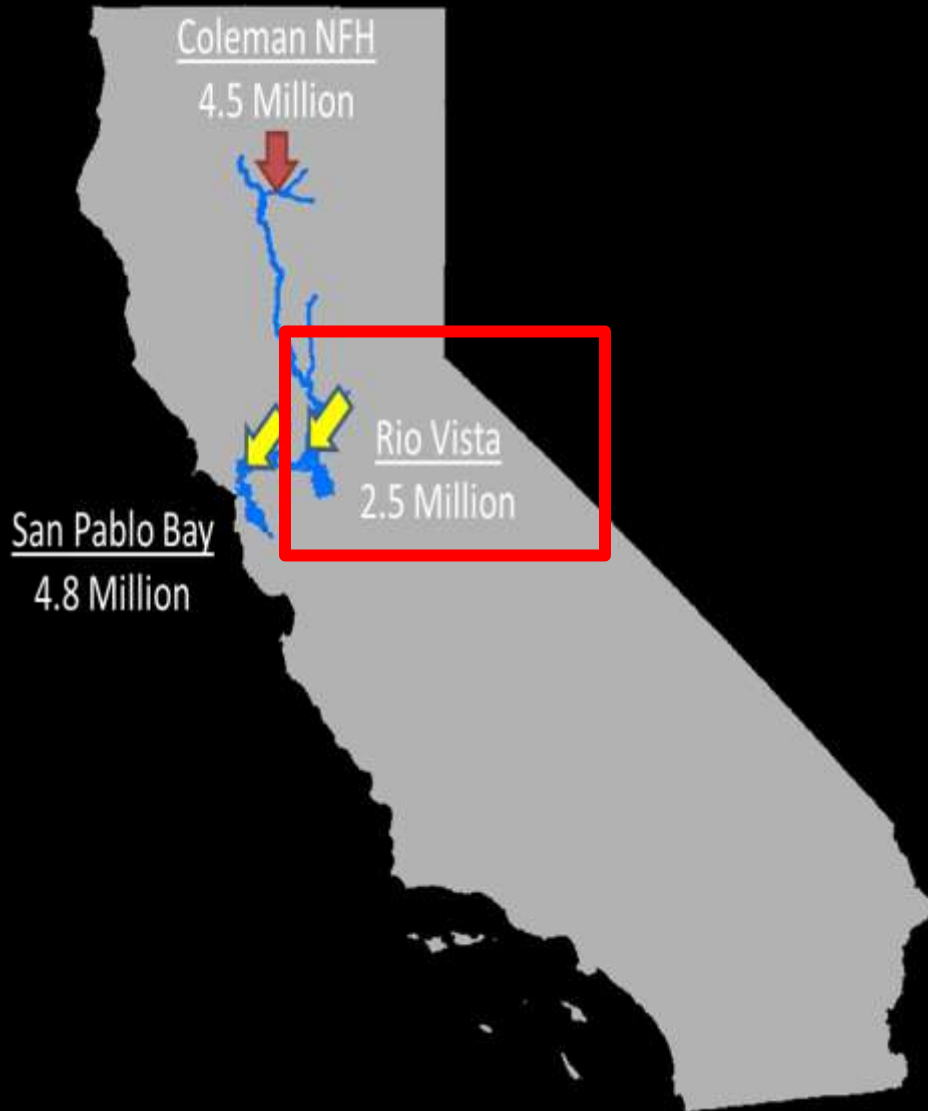
BY 2013 CWT Recovery



- Ocean
- Freshwater Stray
- Battle Creek
- Sac River Sport

Trucking Fall Chinook Salmon

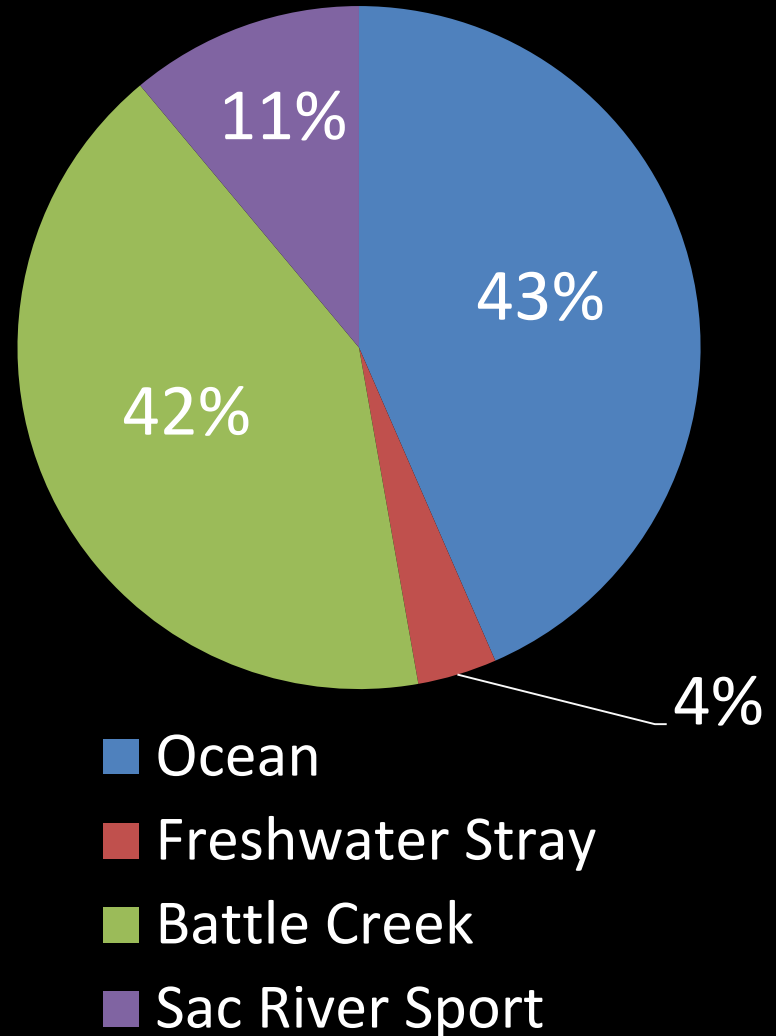
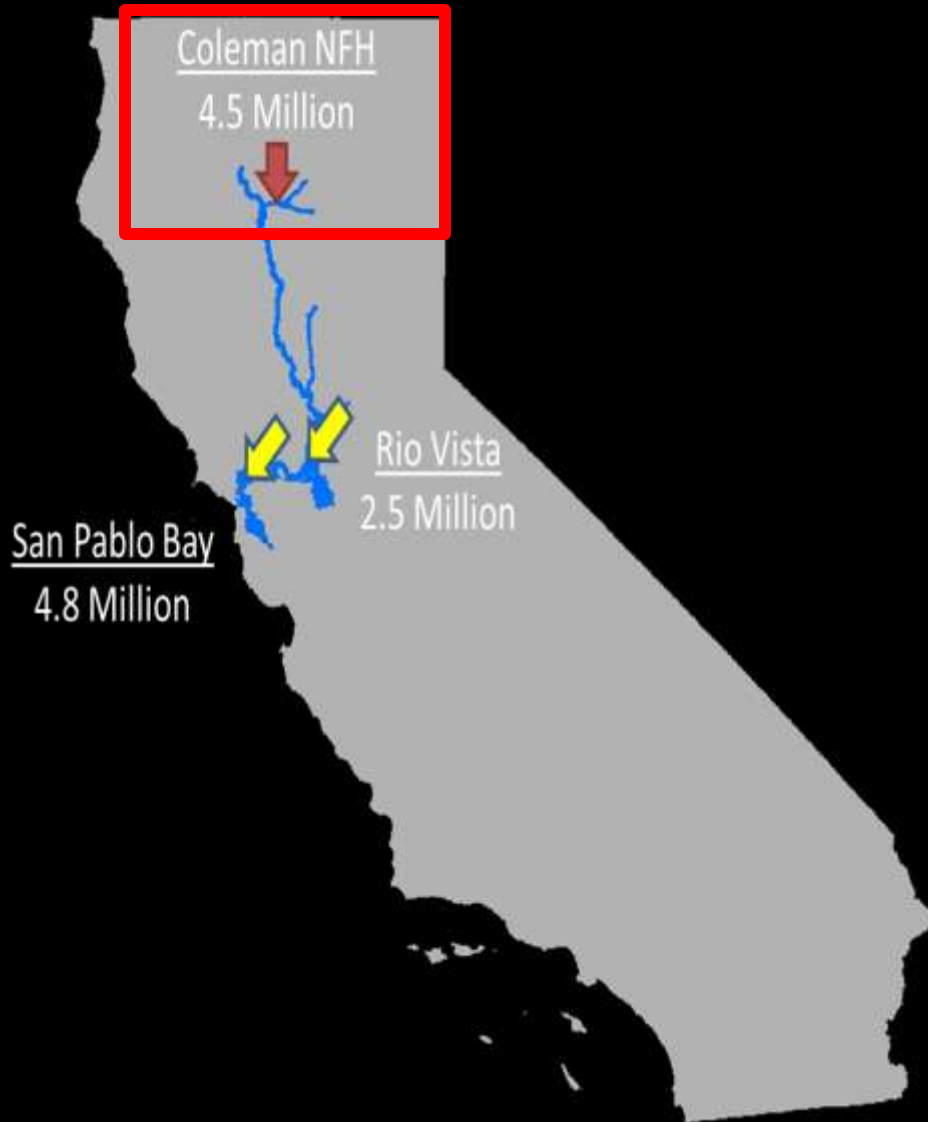
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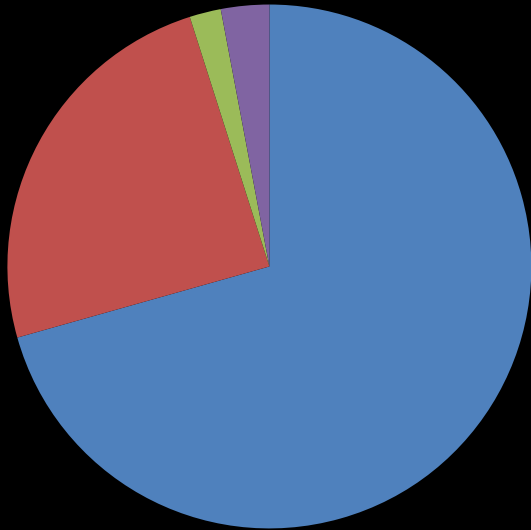
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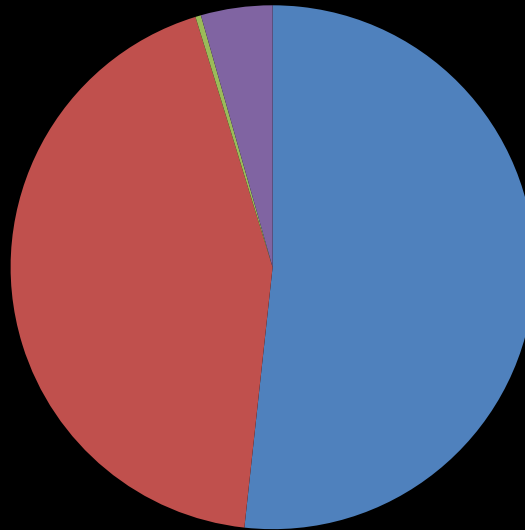
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BY 2013 CWT Recovery

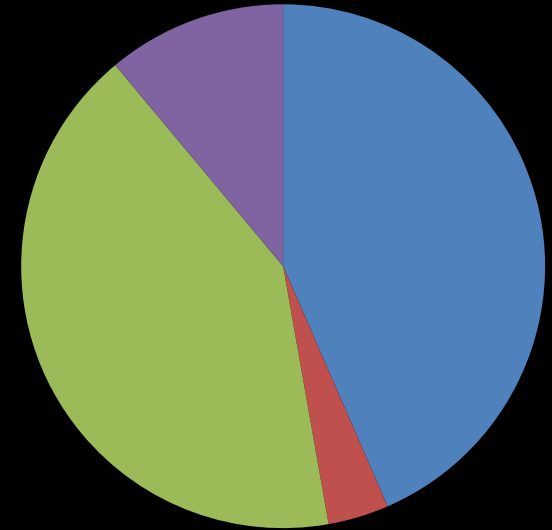
San Pablo Bay



Rio Vista



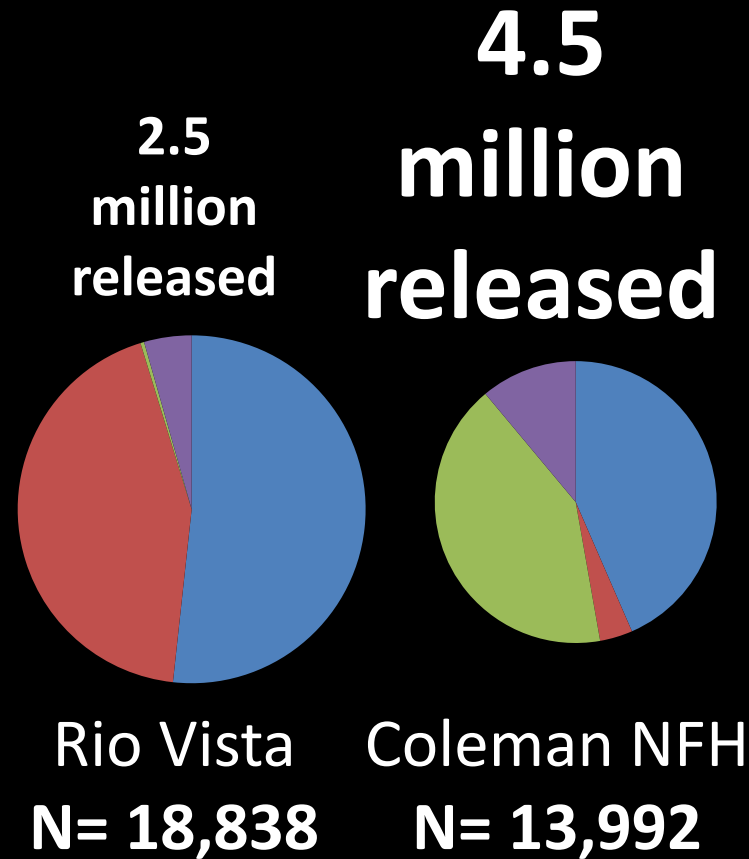
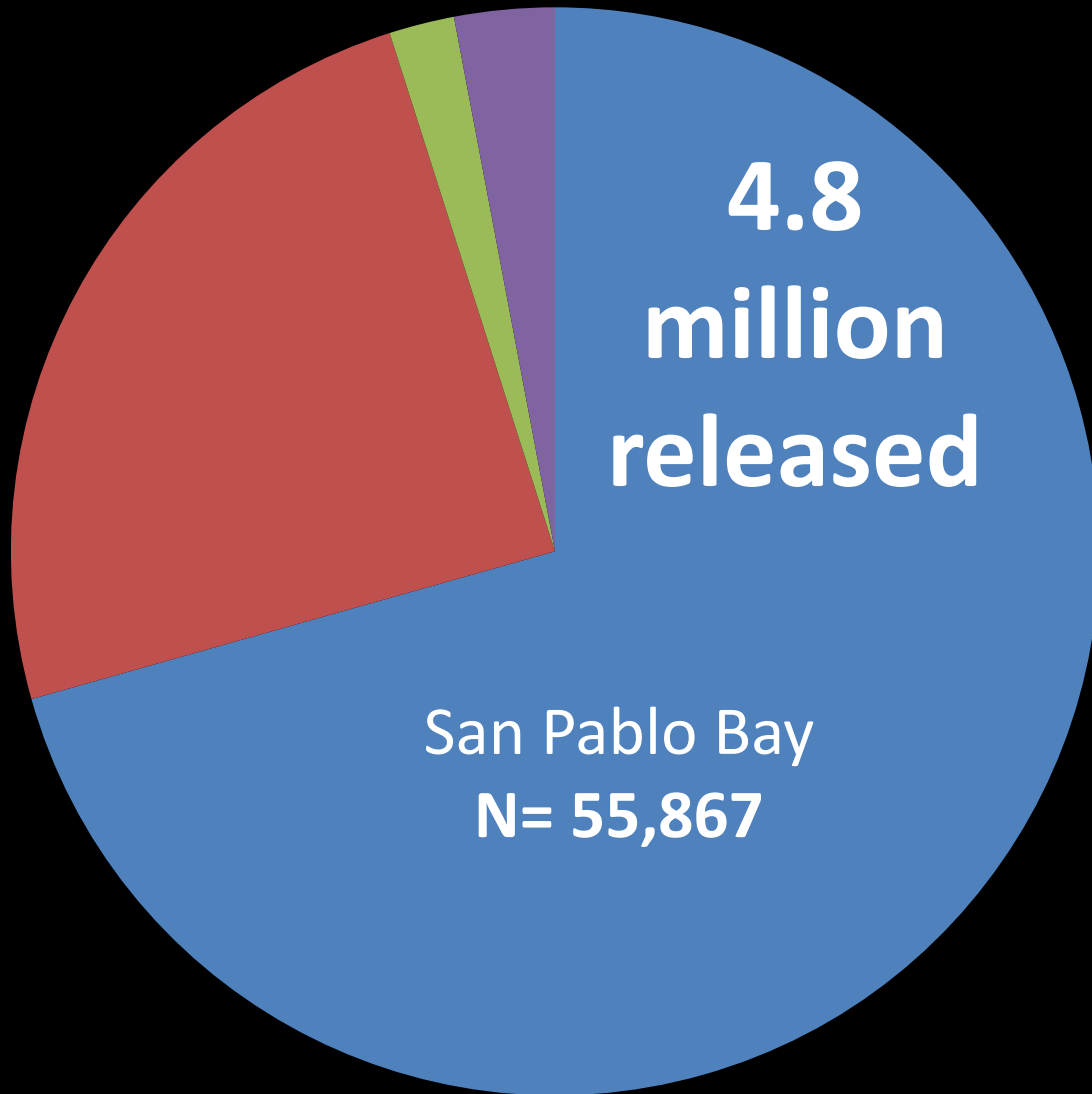
Coleman NFH



- Ocean
- Freshwater Stray
- Battle Creek
- Sac River Sport

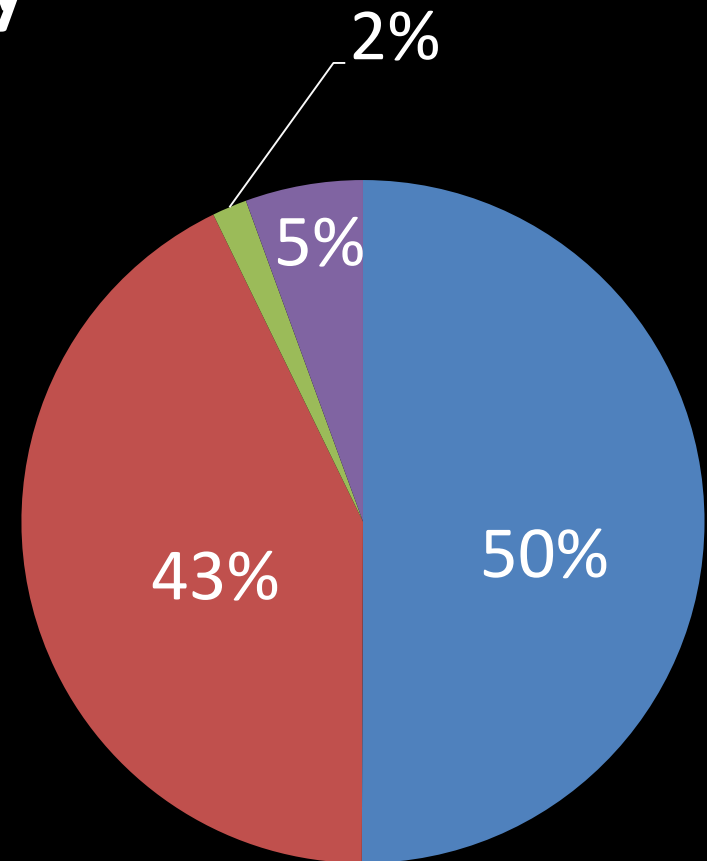
Trucking Fall Chinook Salmon

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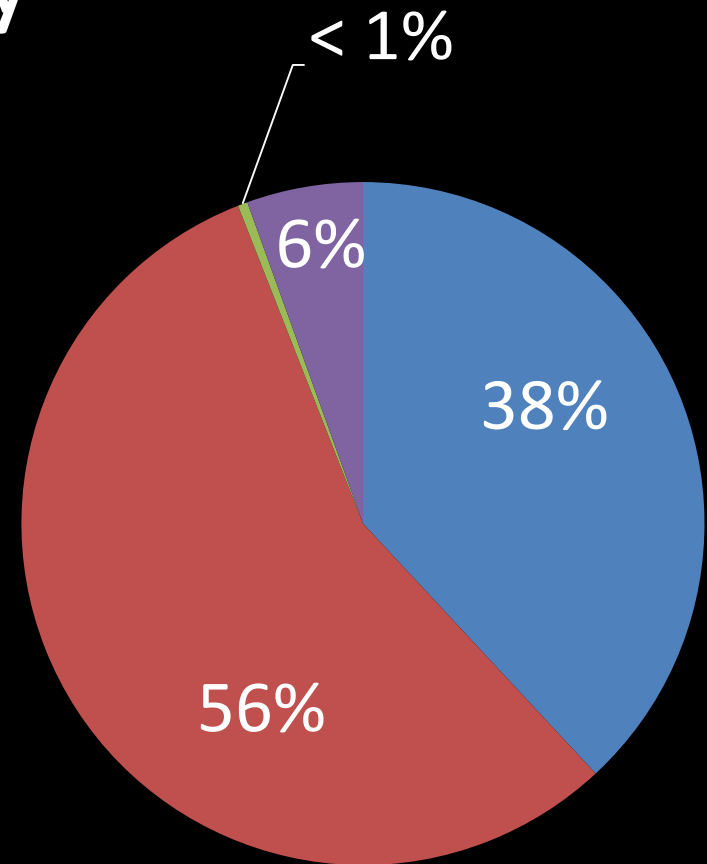
BY 2014 CWT Recovery



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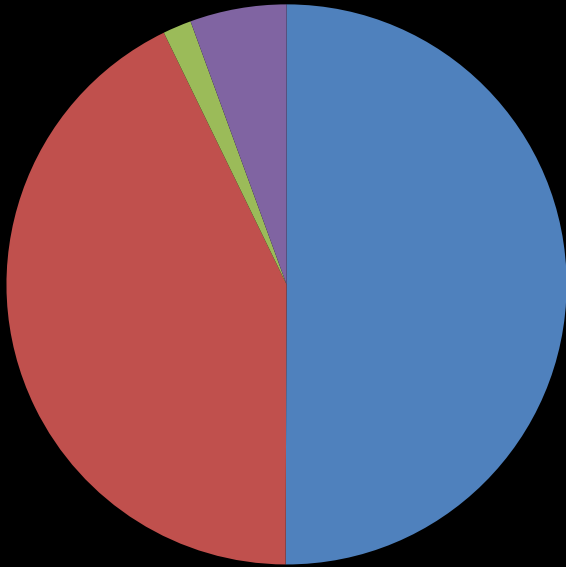


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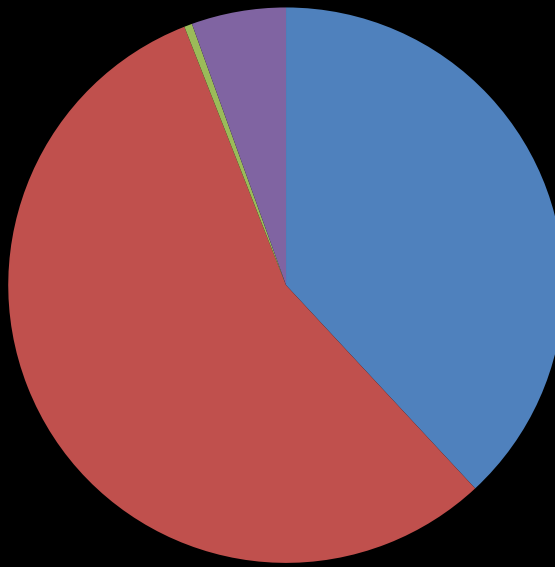
Trucking Fall Chinook Salmon

BY 2014 CWT Recovery

San Pablo Bay



Rio Vista



Coleman NFH



- Ocean
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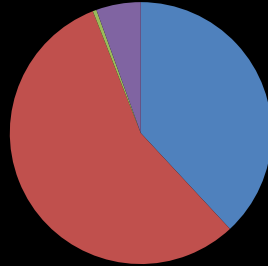
BY 2014 CWT Recovery

**11 million
released**

0.8 million
released

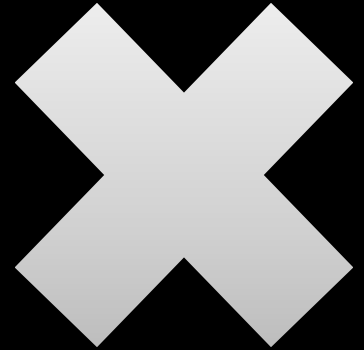


San Pablo Bay
N= 4,719



Rio Vista
N= 11,851

**0
released**



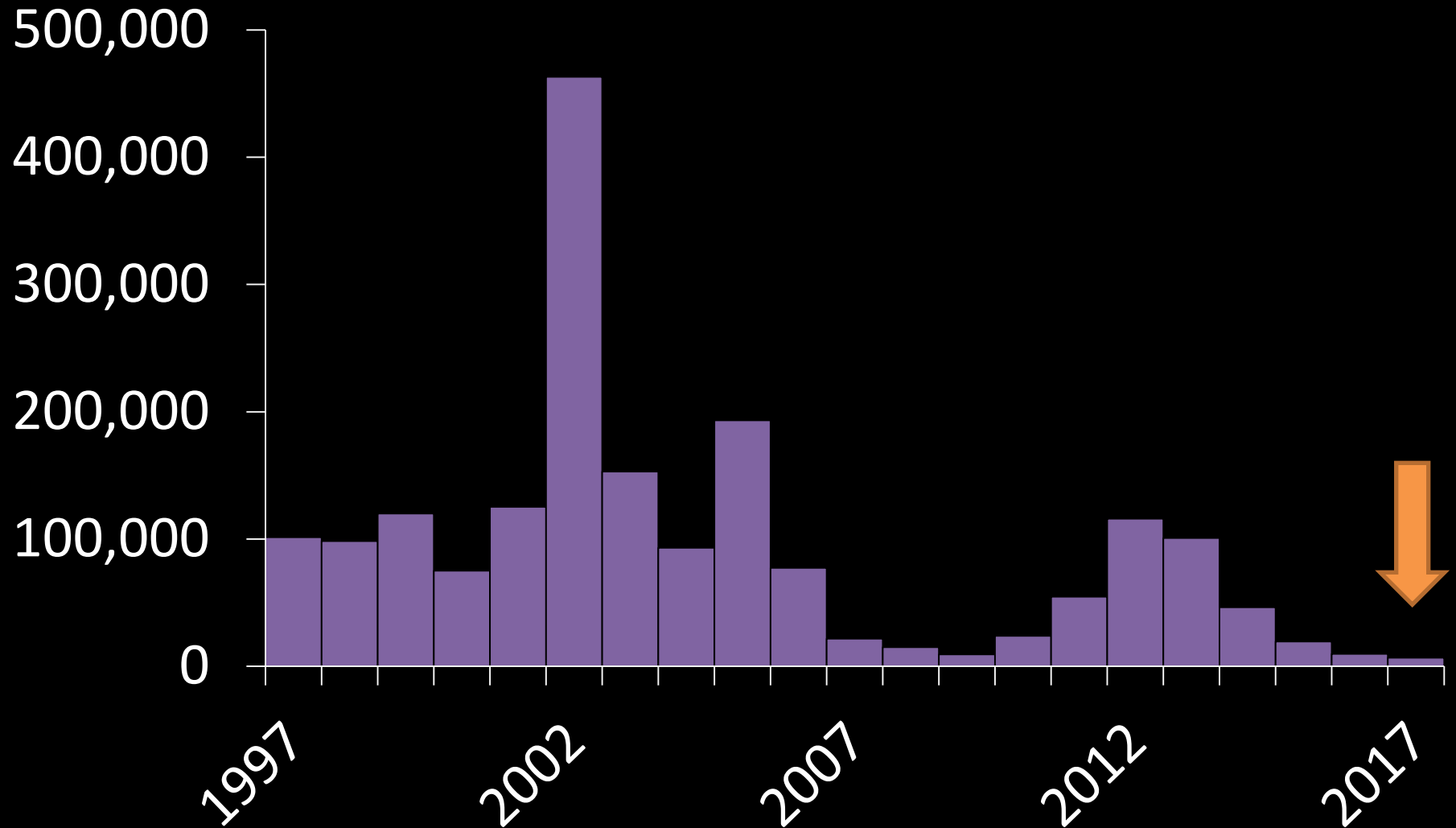
Coleman NFH
N= 0

2017 Coleman NFH Production

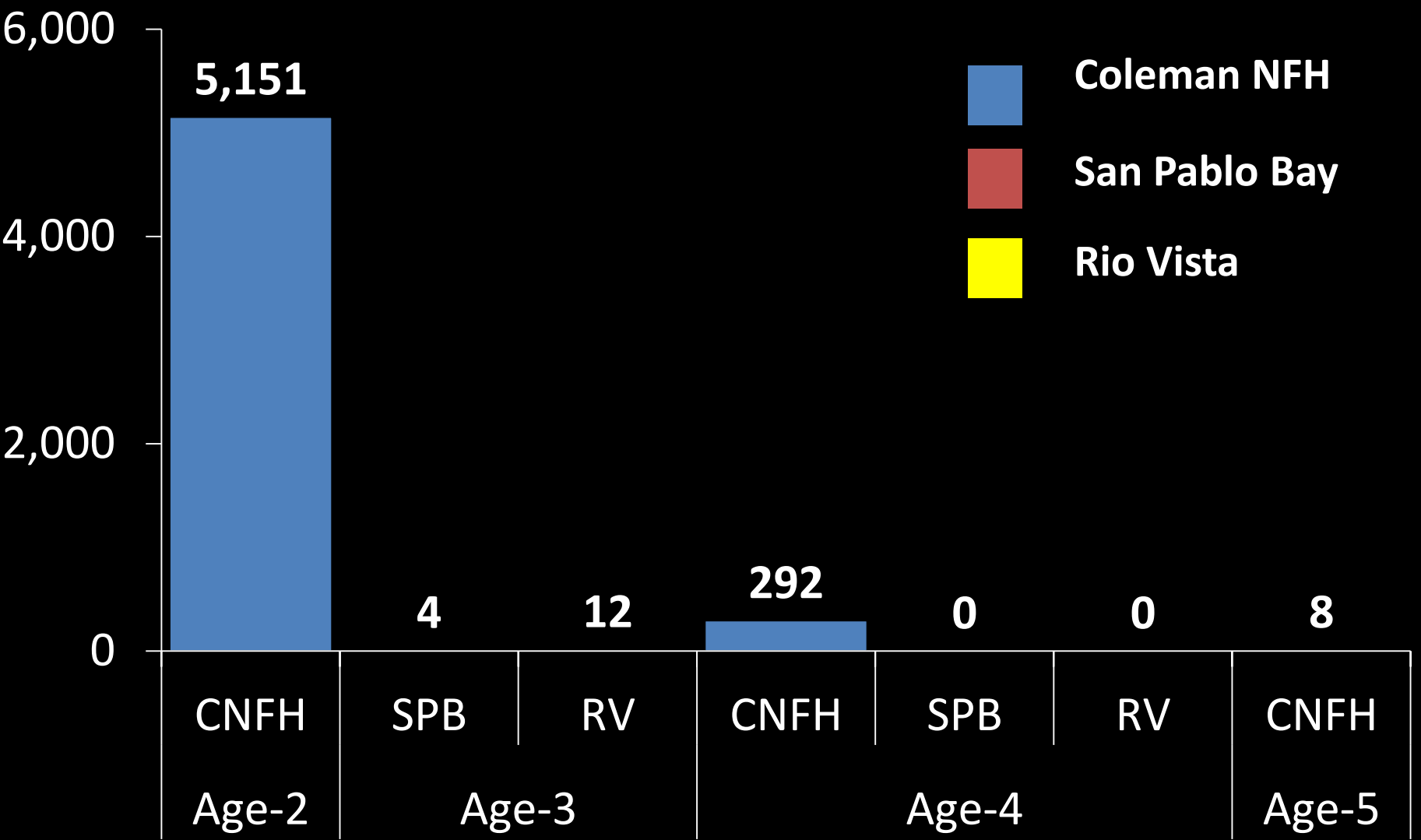


2017 Coleman NFH Production

Battle Creek Run Size

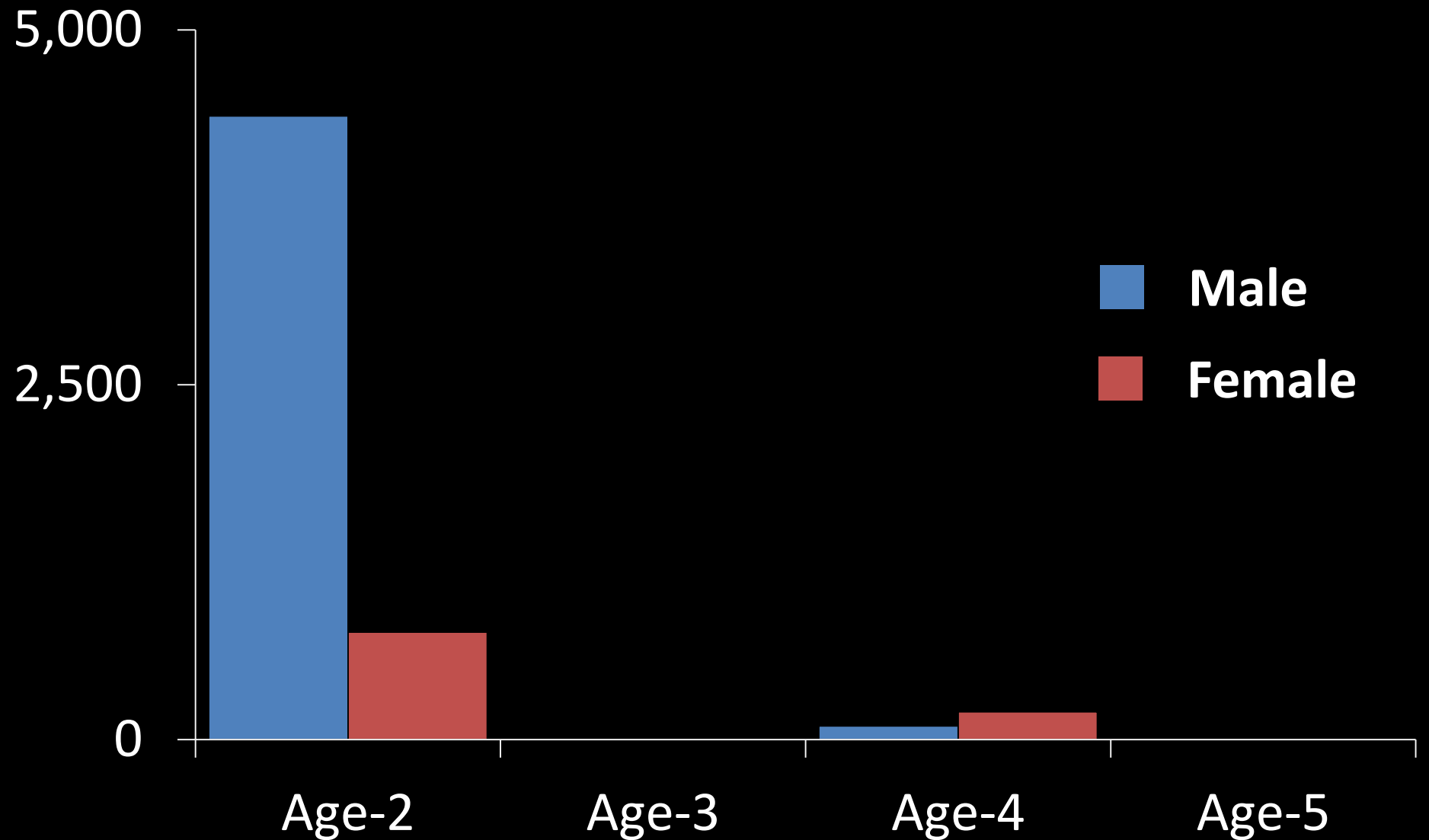


Run Composition: Origin & Age



2017 Coleman NFH Production

Run Composition: Age & Sex

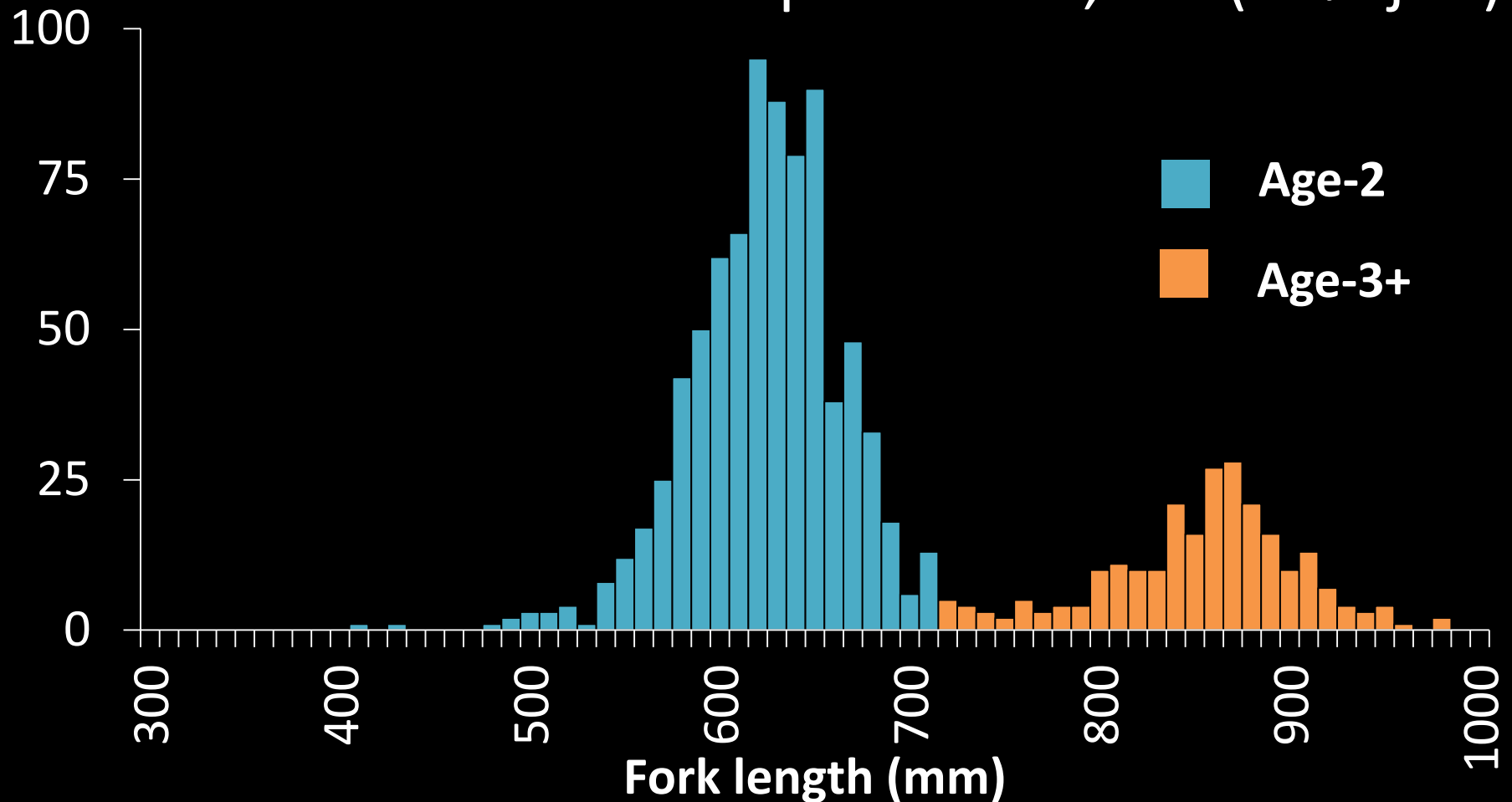


2017 Coleman NFH Production

Females Spawned

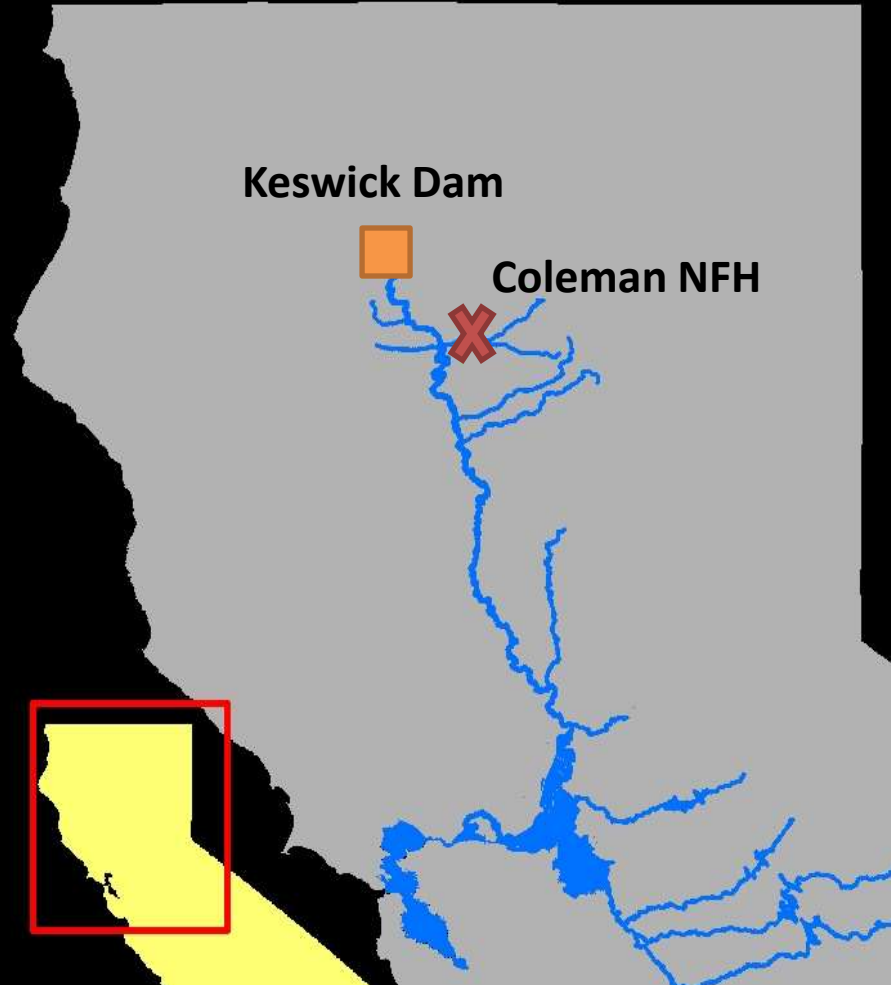
Minimum Requirements: 2,600 females

Spawned: 1,050 (75% jills)



2017 Coleman NFH Production

Keswick Dam Fish Trap



2017 Coleman NFH Production

Keswick Dam Fish Trap



Keswick Trap

- 16 times
- 92 salmon spawned
- 350,000 eyed eggs

2017 Coleman NFH Totals

- 4.2 million eyed eggs
- 30% Egg goal



2017 Coleman NFH Production

Nimbus State Hatchery Spawning

- Collaborative effort between agencies
- Real-time CWT reading
 - Target CNFH:CNFH crosses
- Keep unmarked fish eggs if 75% of CWTs from CNFH



S. Martarano/USFWS

2017 Coleman NFH Production

Nimbus State Hatchery Spawning

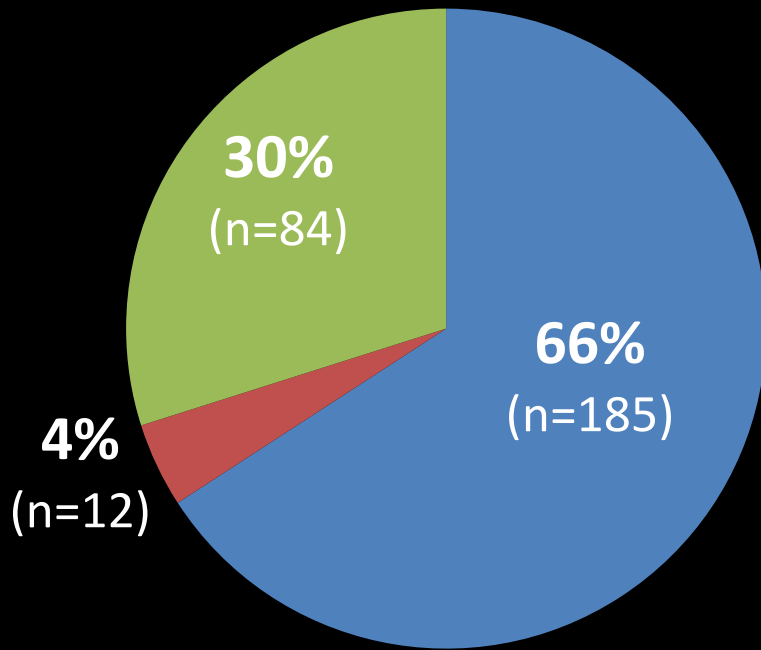
Why Nimbus?

- Run time difference
- High % Coleman strays seen in 2016
- Low impact on Nimbus broodstock collection

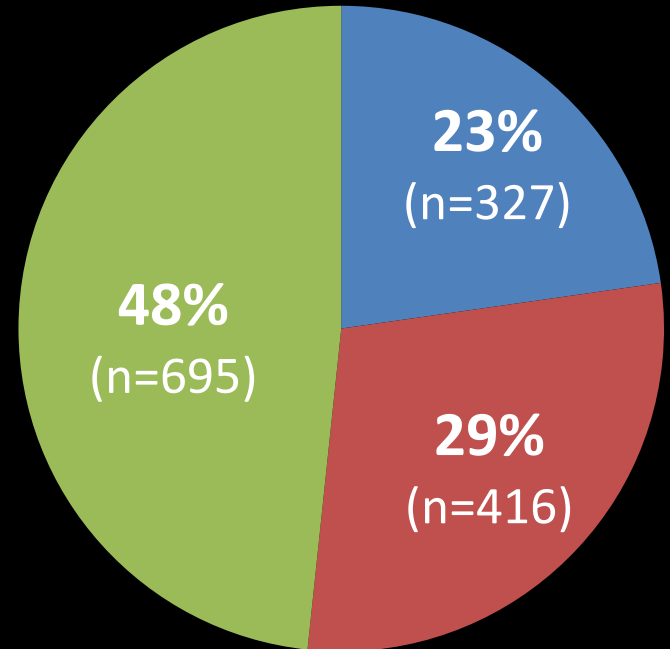


Nimbus State Hatchery CWT Totals

October



November



■ Coleman NFH ■ Nimbus Fish Hatchery ■ Other Hatcheries

Nimbus State Hatchery Spawning

- 1.9 million eggs collected
- Reared to eyed egg stage
- Transferred to CNFH



2017 Totals

- 6.1 million eyed eggs
 - 1.9 mil Nimbus + 4.2 mil CNFH
- ~ 50% Production goal



Next Steps

Better Next Year?



Experimental Early Release

- Fish out smaller/earlier
- Flow event
- Bypass bad in-river conditions
- Adaptive management

Next Steps

Better Next Year?



First year results

- 2 year old returns
- Fish from all groups came back
- Stay tuned

Summary



S. Martarano/USFWS

- High stray rates with off-site releases during drought
- Low returns to Coleman NFH
- Egg collection at Nimbus Hatchery
- ~ ½ of production goal
- More information to come

Questions?

Thank you!

Acknowledgements

- Special thanks to CDFW staff for all their help at Nimbus Hatchery!!
- USFWS Staff at Coleman NFH and RBFWO

