

A study to understand the early life history of Snake River Fall Chinook salmon



**National Marine
Fisheries Service**



Research Objectives

- Collect scale samples from returning adult fall Chinook salmon that had been PIT-tagged as juveniles

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- Compare age-at-ocean-entry with juvenile detection history

Collect scale samples from
previously PIT-tagged fish

NOAA, USFWS, NPT

2005 – 170,239

2006 – 494,172

2008 – 625,451

Lower Granite Dam

2004 – 49,287

Fall 2004-06 – 7,398

Fall 2007-08 – 20,466

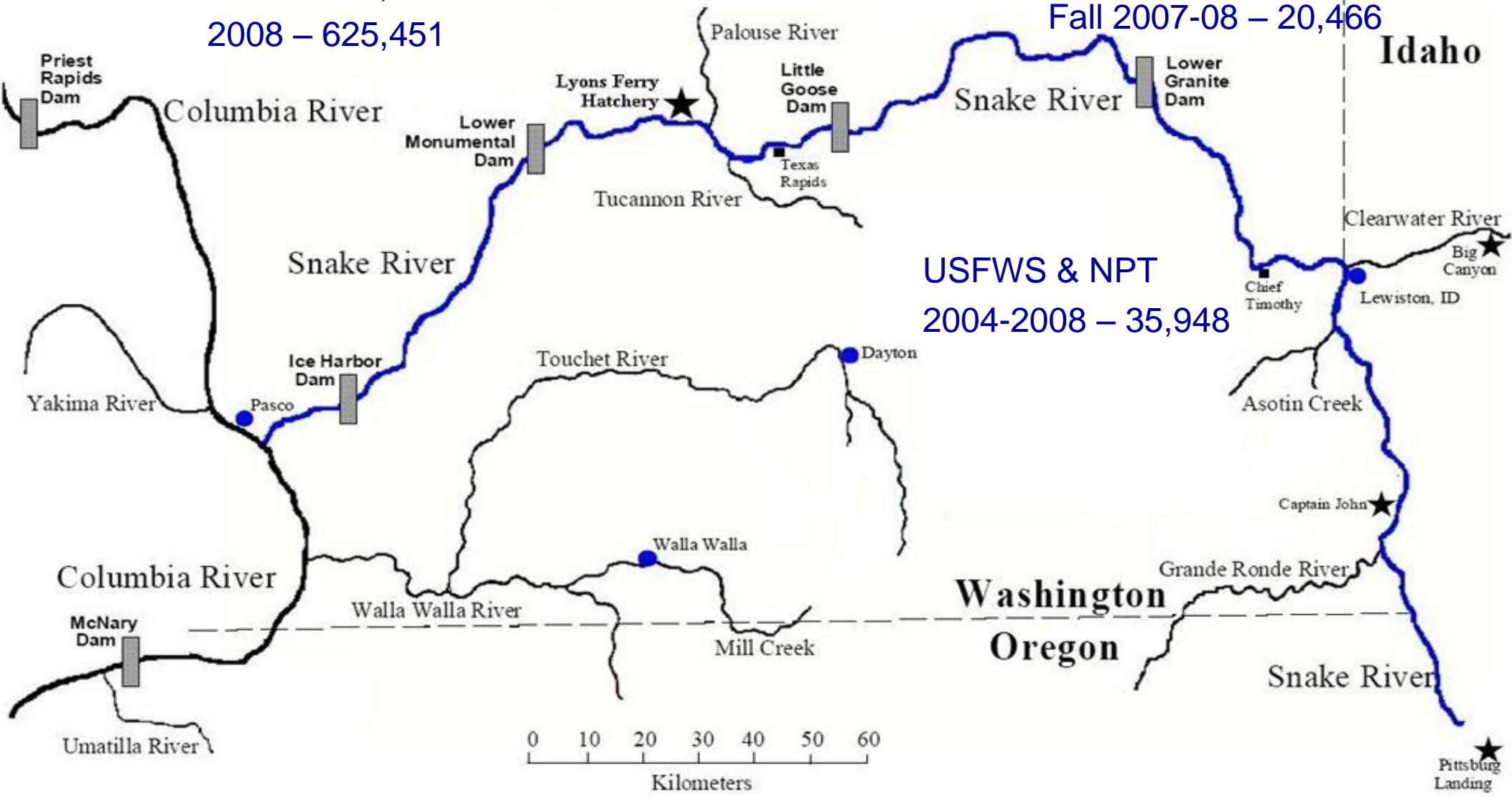
Idaho

USFWS & NPT

2004-2008 – 35,948

Washington

Oregon



2009 – Targeted 1,416,344 NOAA, USFWS, & NPT



2007 3 28

Determine age-at-ocean-entry

Determine age-at-ocean-entry



Compare age-at-ocean-entry
with juvenile detection history

How to group scale results?

| Outmigration year | | Release river/location | | Life history | | Migration history | |
|-------------------|-------|------------------------|-------|--------------|-------|-------------------|-------|
| 2004 | 1 | Snake | 1,797 | Yearling | 426 | Transport | |
| 2005 | 18 | Grande | | Production | 1,278 | Summer | 454 |
| 2006 | 228 | Ronde | 48 | Surrogate | 666 | Fall | 38 |
| 2007 | 134 | Clearwater | 627 | Natural | 110 | Spring | 1 |
| 2008 | 2,258 | Lyons Ferry | 8 | LGR-fall | 159 | Migrants | |
| | | LGR-fall | 159 | | | Summer | 513 |
| | | | | | | Fall | 10 |
| | | | | | | Winter | 17 |
| | | | | | | Spring | 40 |
| | | | | | | Unknown | 1,403 |
| | | | | | | Unknown | 4 |
| | | | | | | LGR-fall | 159 |

Scale Sampling by Return Year

| Return year | Subyearling | Yearling | Unknown | Errors | Totals |
|----------------|-------------|----------|---------|--------|--------|
| 1998 | 2 | 9 | - | - | 11 |
| 1999 | 6 | 23 | - | - | 29 |
| 2000 | 9 | 21 | - | - | 30 |
| 2001 | 1 | 2 | - | - | 3 |
| 2002 | - | 1 | - | - | 1 |
| 2003 | - | 6 | - | - | 6 |
| 2004 | 1 | 8 | - | - | 9 |
| 2005 | 36 | 53 | 14 | - | 103 |
| 2006 | 69 | 71 | 3 | - | 143 |
| 2007 | 434 | 118 | 75 | 5 | 632 |
| 2008 | 484 | 246 | 66 | 7 | 803 |

*Excluded 1999 migration year

Migration Pathway and time of year

| | Subyearling | Yearling | Unknown | Errors | Totals |
|------------------|-------------|----------|---------|--------|--------|
| Transport | | | | | |
| Summer | 276 | 11 | 36 | 1 | 324 |
| Fall | 9 | 35 | 3 | - | 47 |
| Spring | - | 1 | - | - | 1 |
| Late season | 47 | 170 | 15 | 1 | 233 |
| Migrant | | | | | |
| Summer | 294 | 18 | 31 | 2 | 345 |
| Fall | 2 | 27 | 2 | - | 31 |
| Winter | - | 38 | 6 | - | 44 |
| Spring | - | 103 | 11 | 3 | 117 |
| Not detected | 408 | 155 | 54 | 5 | 622 |

Migration Pathway and time of year - Snake and Clearwater Rivers

| | Snake River | | Clearwater River | |
|------------------|-------------|----------|------------------|----------|
| | Subyearling | Yearling | Subyearling | Yearling |
| Transport | | | | |
| Summer | 173 | 10 | 103 | 1 |
| Fall | 2 | 8 | 7 | 27 |
| Spring | - | - | - | 1 |
| Migrant | | | | |
| Summer | 183 | 14 | 111 | 4 |
| Fall | 1 | 13 | 1 | 14 |
| Winter | - | 4 | - | 34 |
| Spring | - | 30 | - | 56 |
| Not detected | 248 | 54 | 160 | 80 |

Migration Pathway and time of year - Pre-spill and With spill

| | 1998-2004 | | 2005-2008* | |
|------------------|-------------|----------|-------------|----------|
| | Subyearling | Yearling | Subyearling | Yearling |
| Transport | | | | |
| Summer | 36 | 8 | 240 | 3 |
| Fall | 2 | 7 | 7 | 28 |
| Spring | - | - | - | 1 |
| Migrant | | | | |
| Summer | 24 | 13 | 270 | 5 |
| Fall | 2 | 13 | - | 14 |
| Winter | - | 5 | - | 33 |
| Spring | - | 34 | - | 69 |
| Not detected | 7 | 45 | 401 | 110 |

Age of Ocean entry

- Adult age class distributions

| | Mini-jack | Jack | 2-ocean | 3-ocean | 4-ocean | 5-ocean |
|-------------------------|-----------|------|---------|---------|---------|---------|
| Number of adults | | | | | | |
| Age-0 | - | 451 | 515 | 70 | 18 | 1 |
| Age-1 | 176 | 232 | 103 | 54 | 1 | - |
| Adult length | | | | | | |
| Age-0 | - | 479 | 663 | 793 | 885 | 830 |
| Age-1 | 440 | 616 | 752 | 849 | 740 | - |

Age of Ocean entry

- Adult age class distributions

| | Mini-jack | Jack | 2-ocean | 3-ocean | 4-ocean | 5-ocean |
|--------------|-----------|------|---------|---------|---------|---------|
| Age-0 | | | | | | |
| Females | - | - | 150 | 39 | 11 | 1 |
| Males | - | 448 | 340 | 26 | 6 | - |
| Age-1 | | | | | | |
| Females | - | 26 | 59 | 31 | - | - |
| Males | 174 | 197 | 35 | 15 | 1 | - |