

# FISH POPULATION TRENDS IN OREGON:

WHAT DOES THE PAST TELL US ABOUT THE FUTURE



**LESSONS LEARNED (Past)**  
OR  
**DOCUMENTED DOOMSDAY (Past)**

☐ **FISH BI-OPTIMIST**

☐ **FISH BI-OLOGIST**



# How? When? Where? and Why?

## Did This Happen to Our Fish

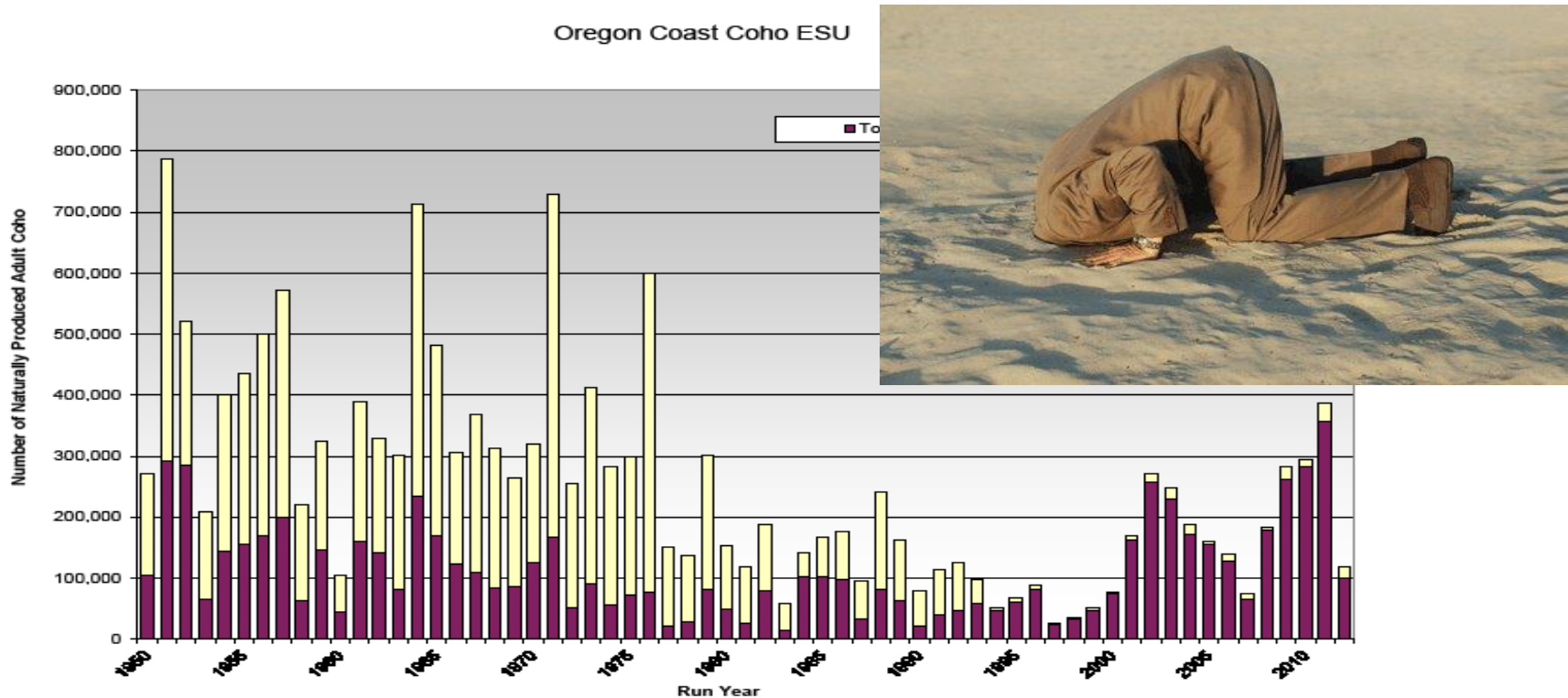


Figure 1. Estimated numbers of naturally produced adult coho in the Oregon Coast Coho ESU (run years 1950 to 2012). Number of adult coho spawning in the wild, and harvest impacts (both landed and non-landed).

# The Very Past: Fish and Habitat

- 100+Million Years Ago (MYA) – Fish with/wo bones
- **65 MYA -Really Big Rock Hit Planet- 90% survived**
- 24 MYA – salmon and trout family
- 10 MYA – chinook, coho, sockeye, chum, pink
- 10,000 years ago (YA)- evolution process (**Extinction**)
- 7,000 YA- recolonize during/after glaciers (**Move**)
- 5,000 YA- current ecosystems developed (**Adapt**)
- **200 YA- European settlement (**Tolerate**)**
- **FUTURE>>> (any/all of above ???)**

What Response Will Fish Make- Future “FinPrint” =LESS  
What Choice Will We Make-Human “Footprint”=MORE

- **1. Go “Extinct”**  
*(All In, All Dead)*
- **2. Change “Distribution”**  
*(Move In, Move Out)*
- **3. Tolerate “New Conditions”**  
*(Survival Mode, No Time for Change)*
- **4. Adapt to “New Normal”**  
*(Maintain Diversity, Continue Evolution Process)*

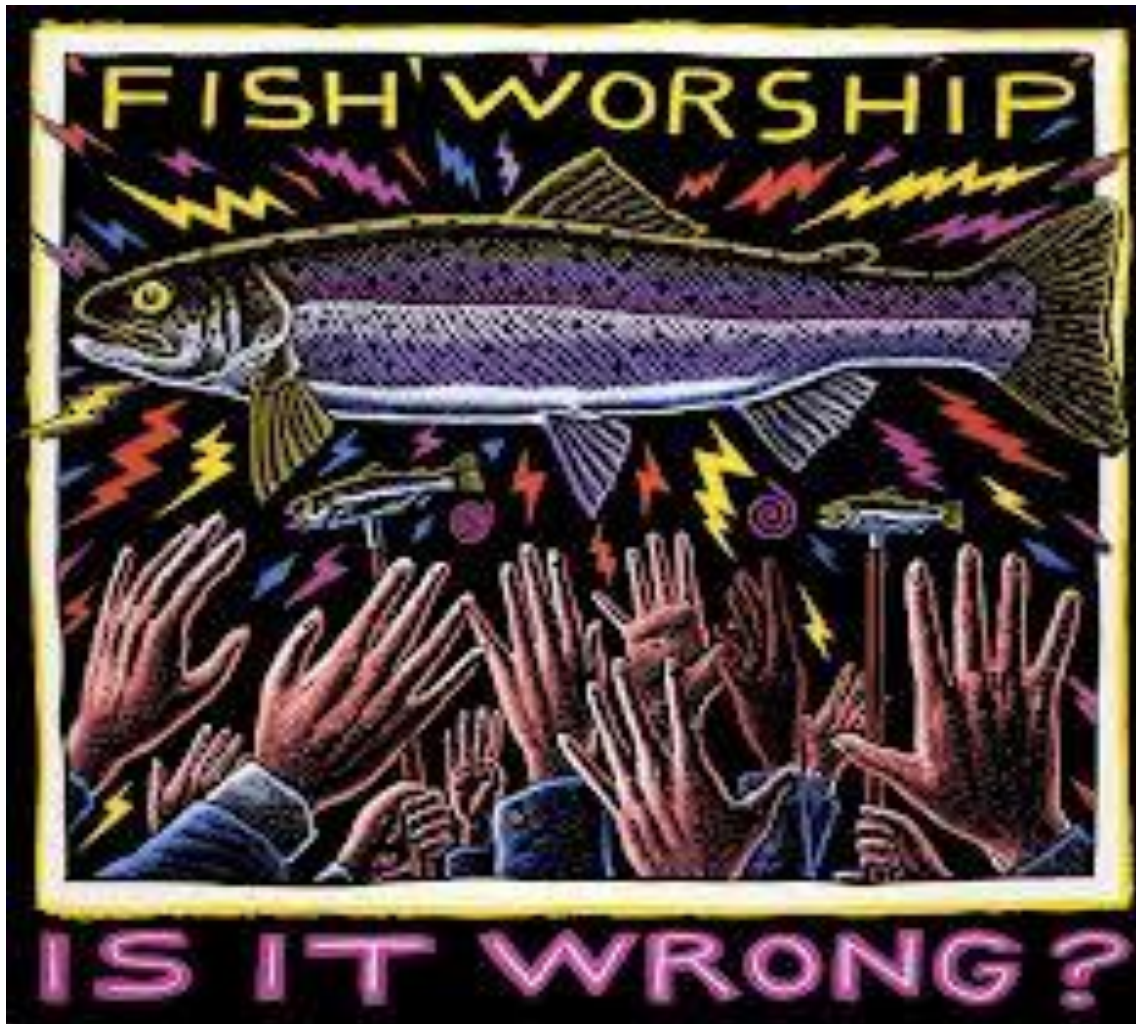
(Waples et al, 2008)

# Recent Past: 50-100 years

- **Extinction:** 30% of historical salmon populations in the Pacific Northwest and California are now extinct.
- **Movement** limited and/or forced: Significant range blocked by fish passage and fragmented habitat
- **New Conditions:** Habitat, Harvest, Hatchery need to be tolerated (limiting factors)
- **Abundance/Diversity**- Very few salmon generations (less than 35) have gone through recent changes to adapt genetically compared to past timeline (more than 1000)



# FUTURE OF ENDANGERED SPECIES ?



# Oregon Coast Coho ESU



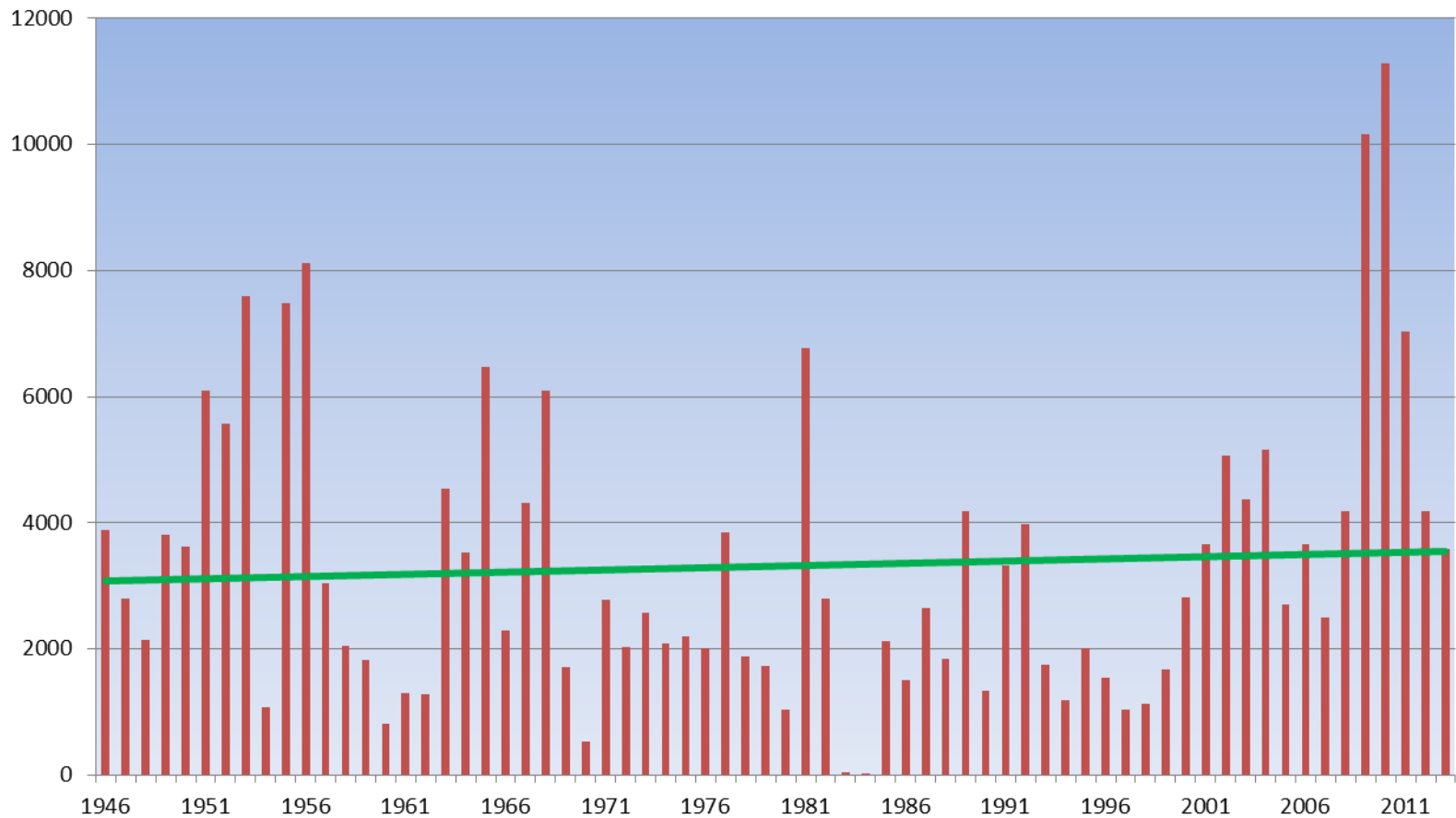


# Oregon Coastal Salmon and Trout Management Plan, ODFW 2014

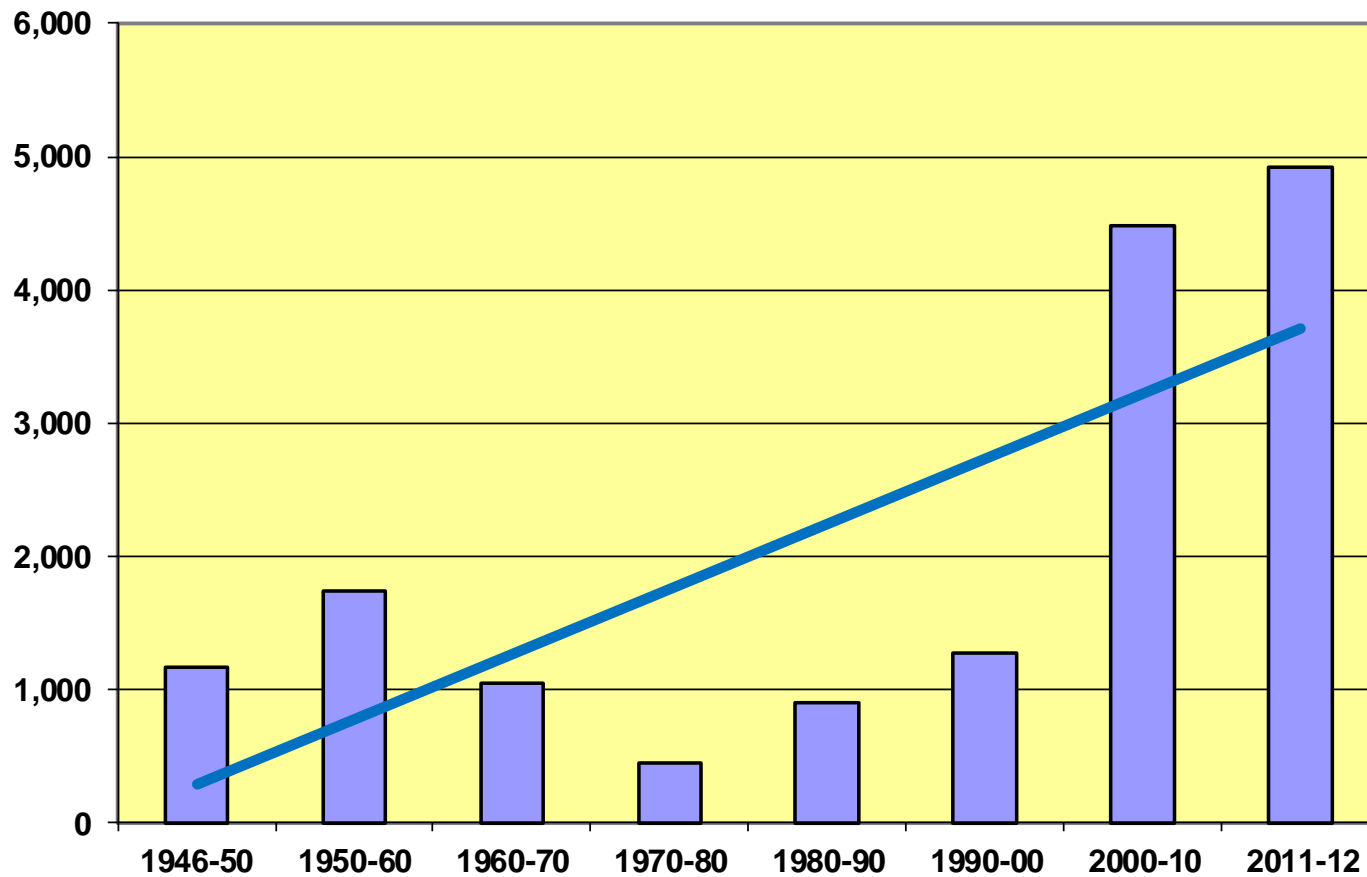
## COUNTS OF FISH NOSES AND FINS

- ❖ **Species status and fishing are not in a crisis mode**, although virtually all species are likely to be at less than 25% of historical abundance.
- ❖ **All species management units (SMU's)**, except chum salmon, **are currently viable and healthy**, although not necessarily at historical abundance levels.
- ❖ **Only 3 out of 64 populations are “non-viable”.**

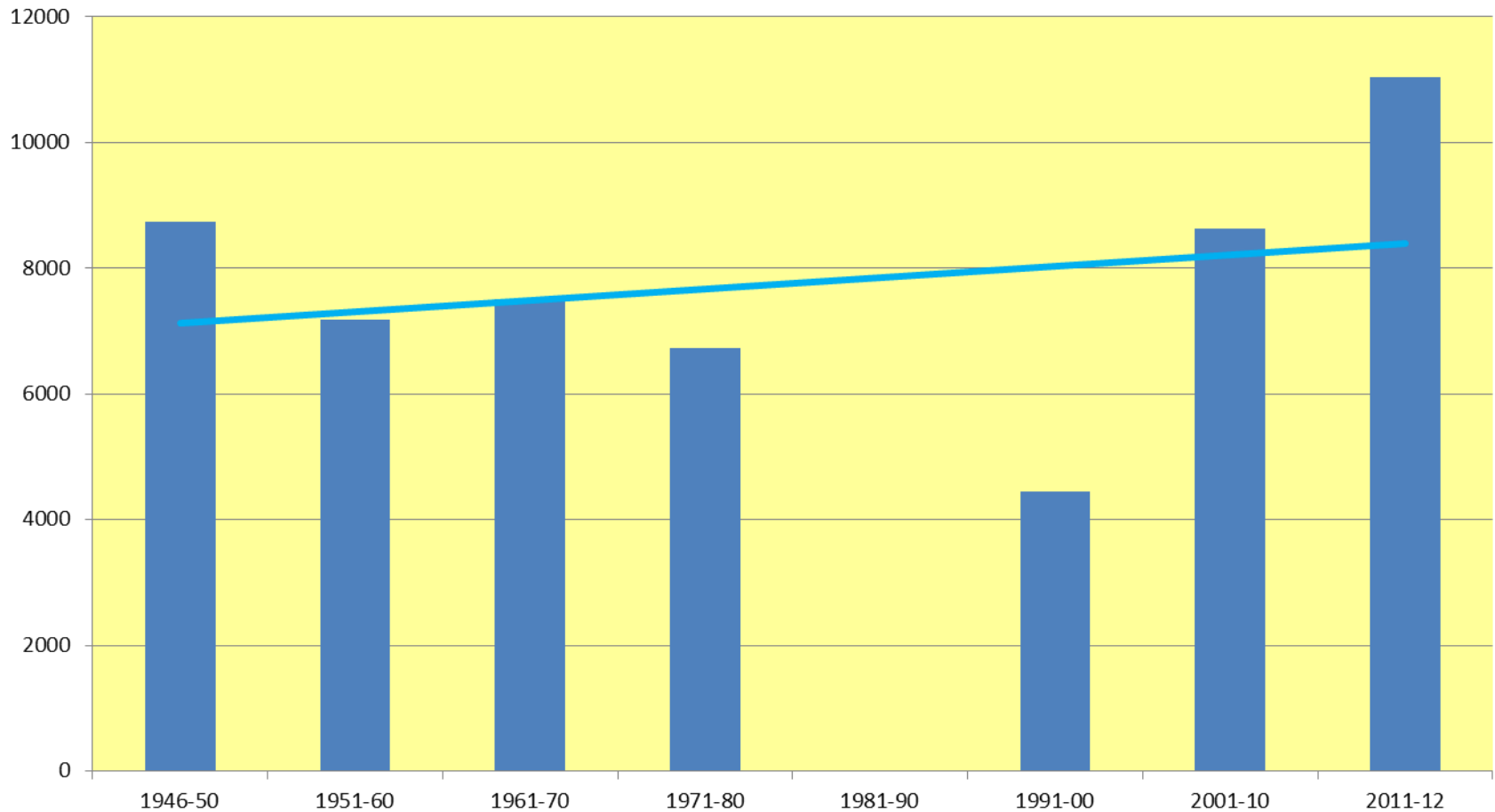
# NORTH UMPQUA WILD COHO POPULATION ABUNDANCE since 1946



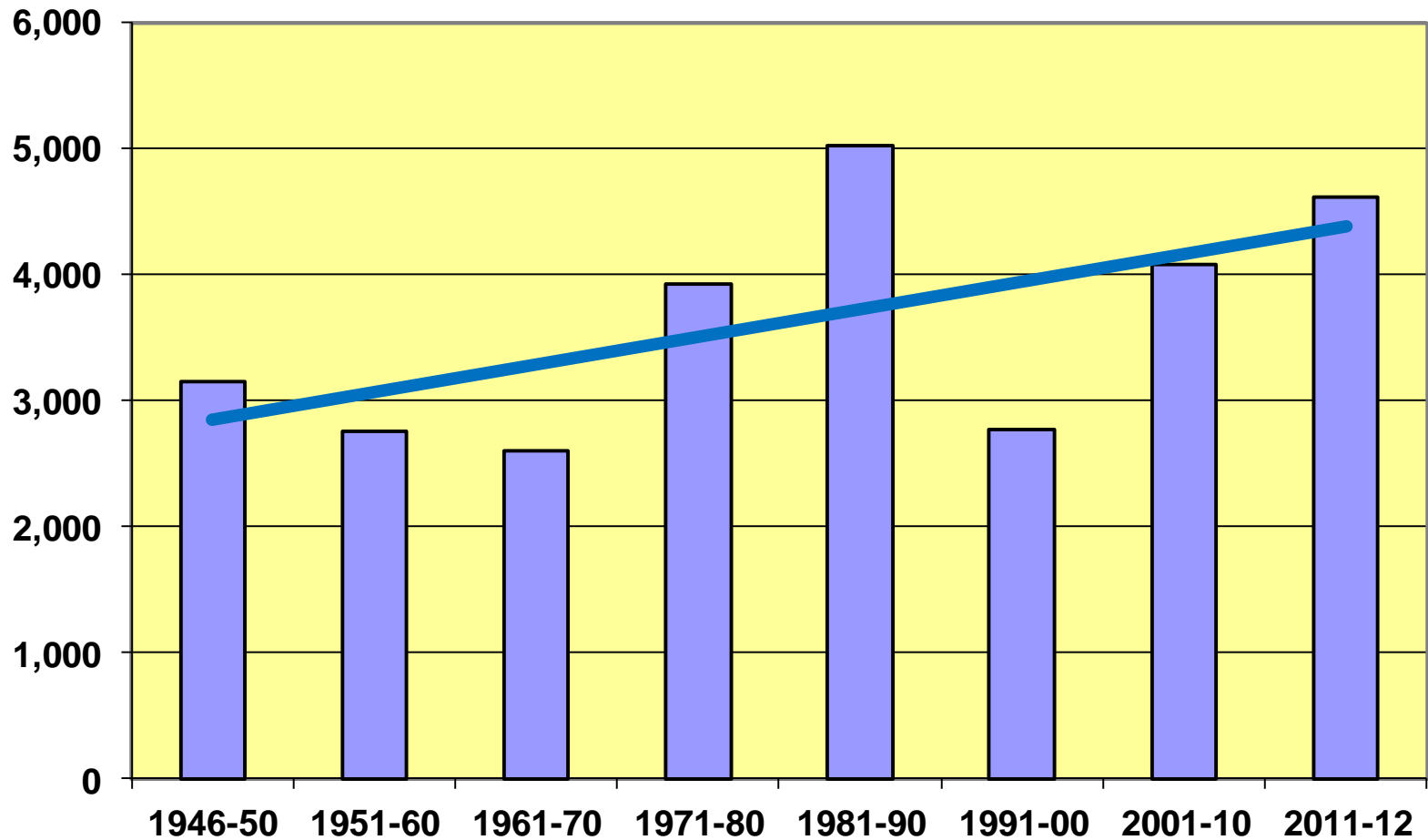
# WILD COHO NORTH UMPQUA BY DECADE



# WILD WINTER STEELHEAD NORTH UMPQUA BY DECADE



# WILD SUMMER STEELHEAD NORTH UMPQUA BY DECADE

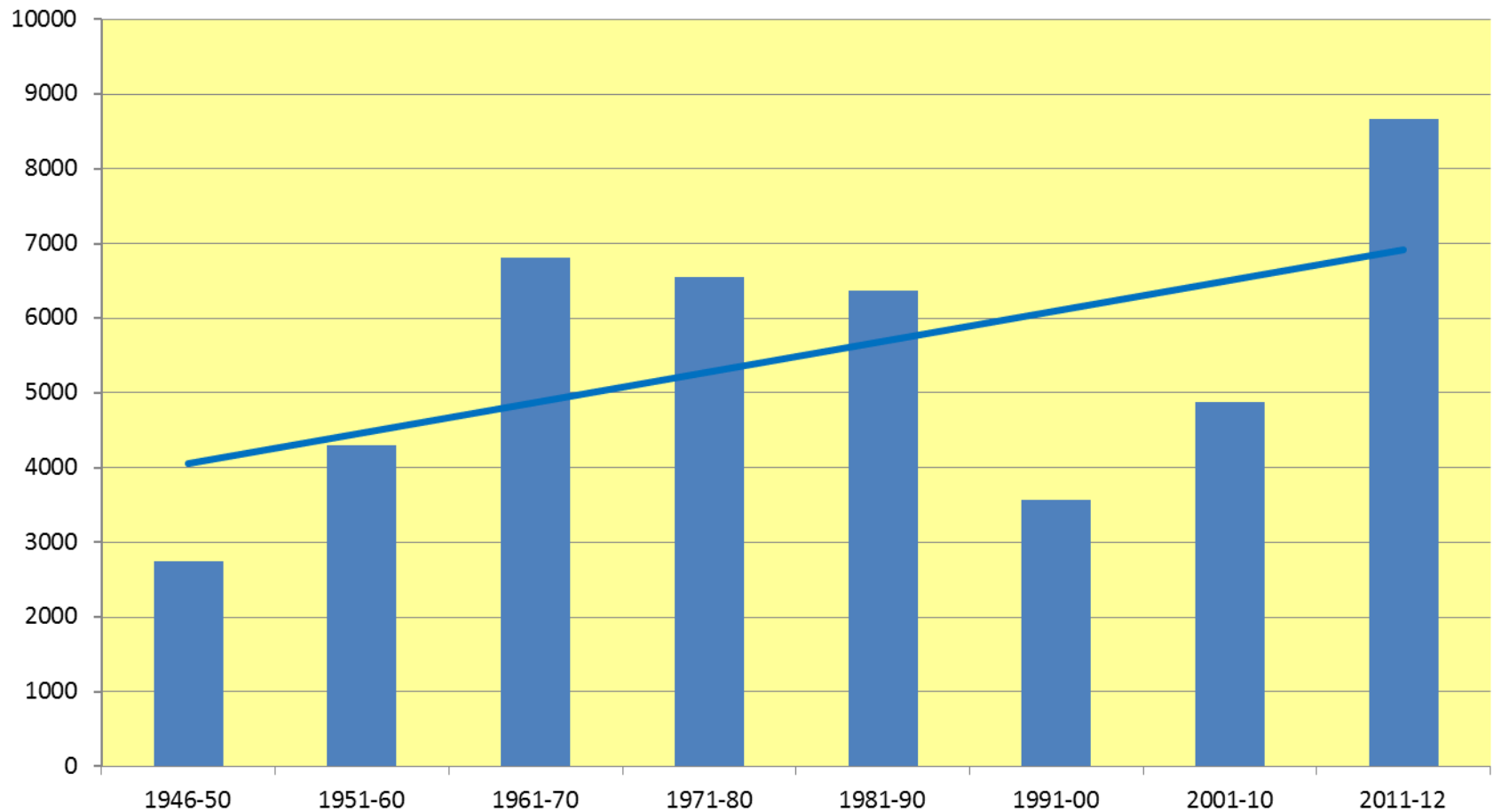




# WILD SPRING CHINOOK

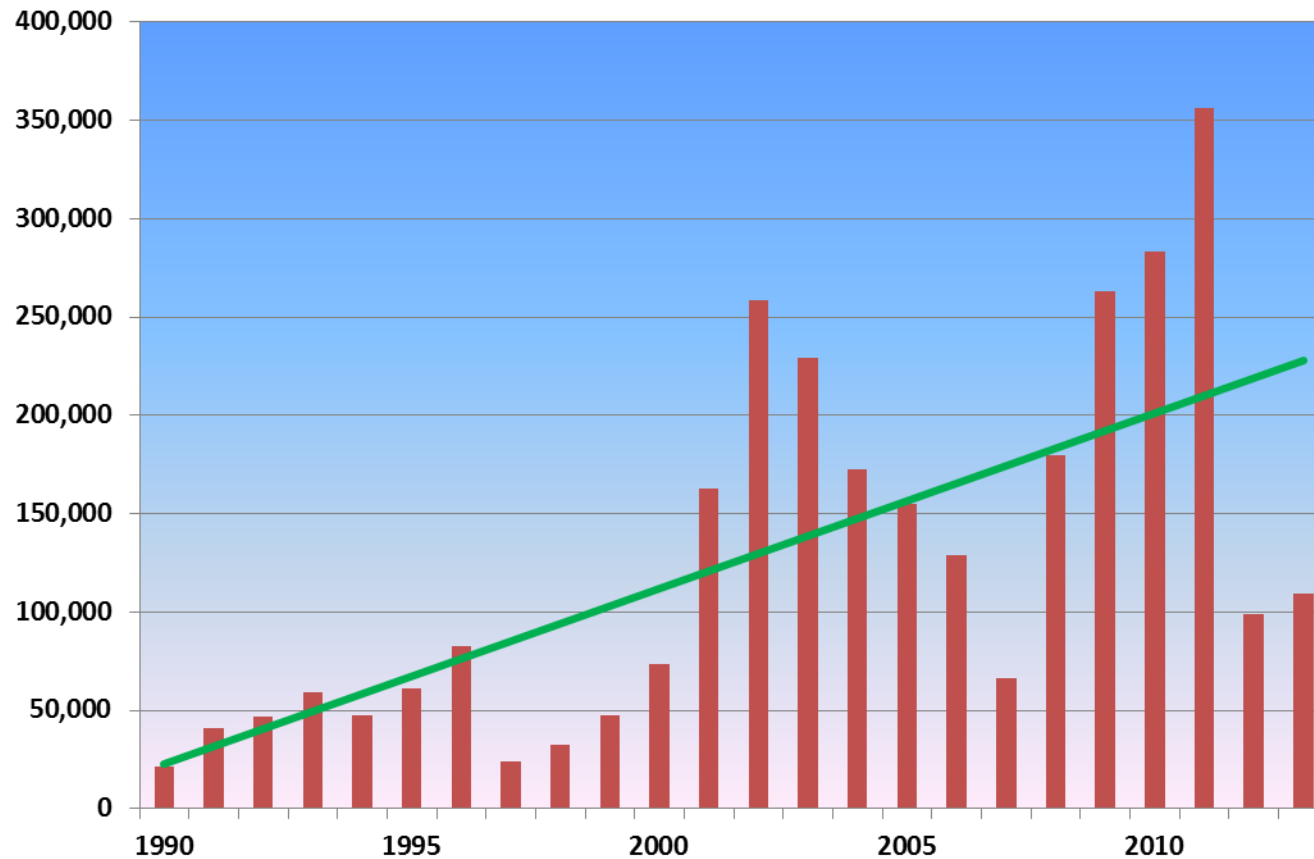
## NORTH UMPQUA

### BY DECADE



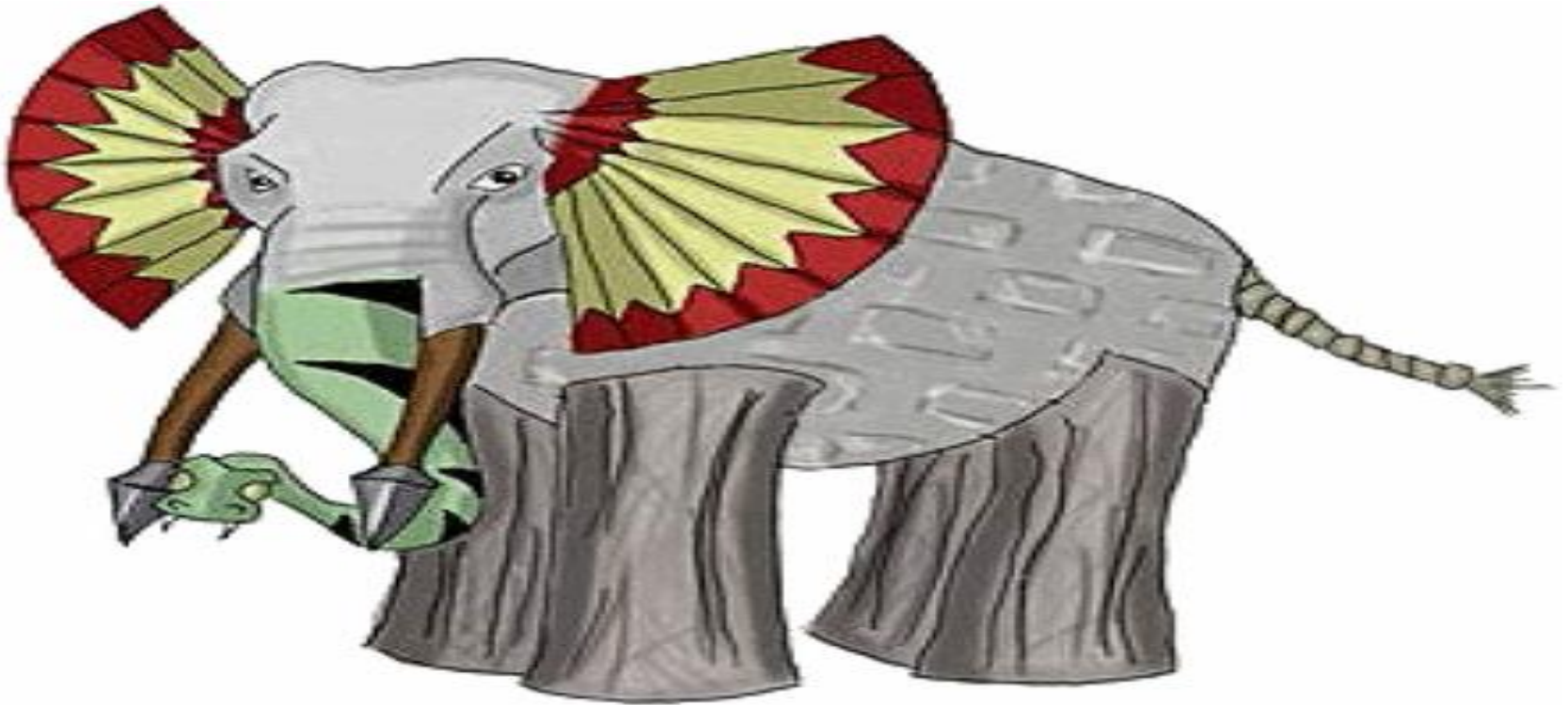
# WILD COHO SPAWNERS

## OREGON COAST, 1990-2013

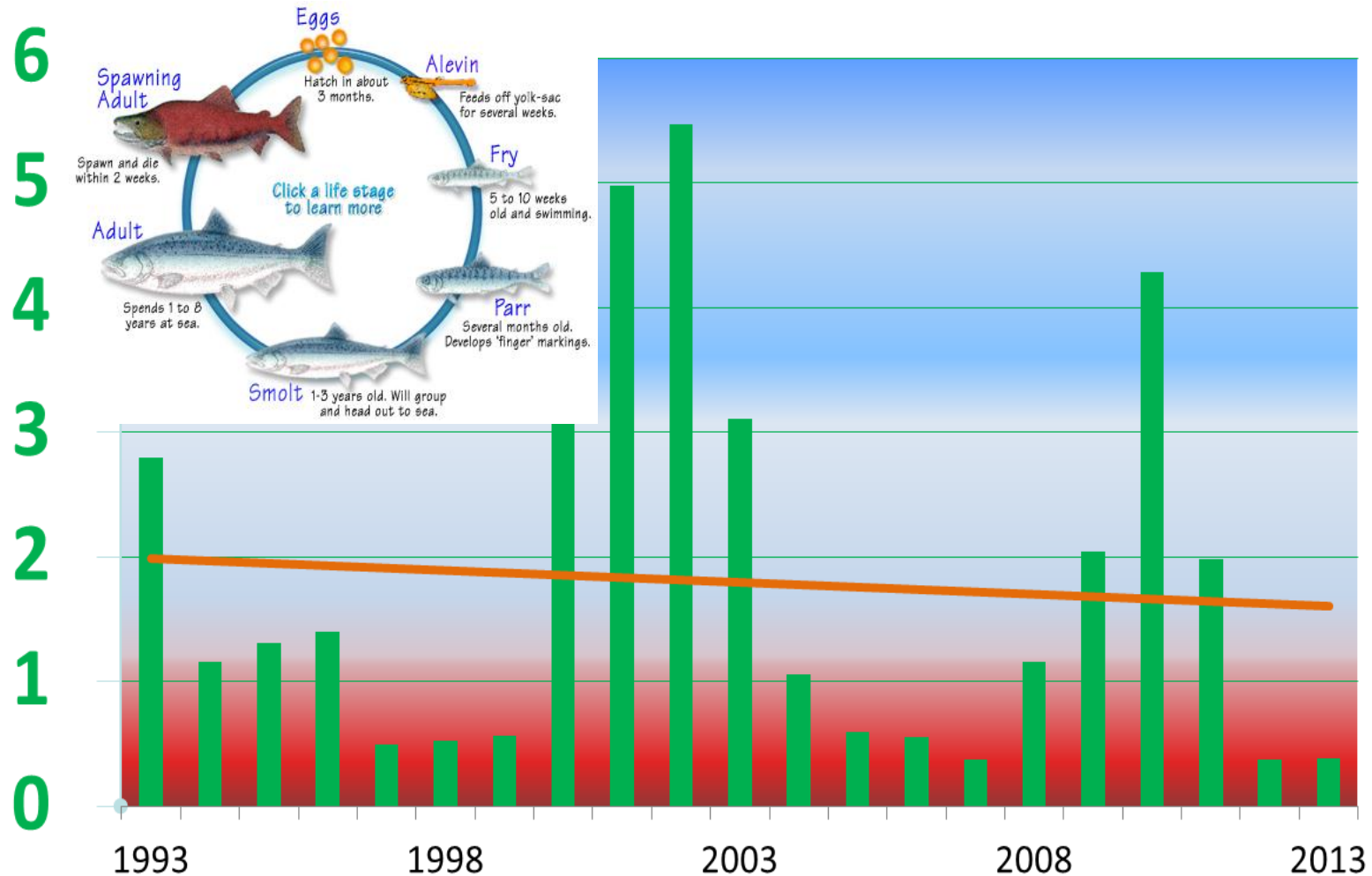


# Best “and” Available Science

What do we know about the problem & solve “in time”  
when we have access to only parts of the fish & its past



# Spawner to Spawner Ratio Has Not Been at Replacement Level for Oregon Coast Wild Coho 1 out of 3 Years



# The Mysterious & Lessor-Known Fishes

## Species in Nearby Stream

**Pacific lamprey**

**Western Brook lamprey**

**Redside shiner**

**Umpqua chub**

**Umpqua pikeminnow**

**Largescale sucker**

**Dace**

**Sculpin**

\*\*\*\*\*

Coho salmon

Winter steelhead

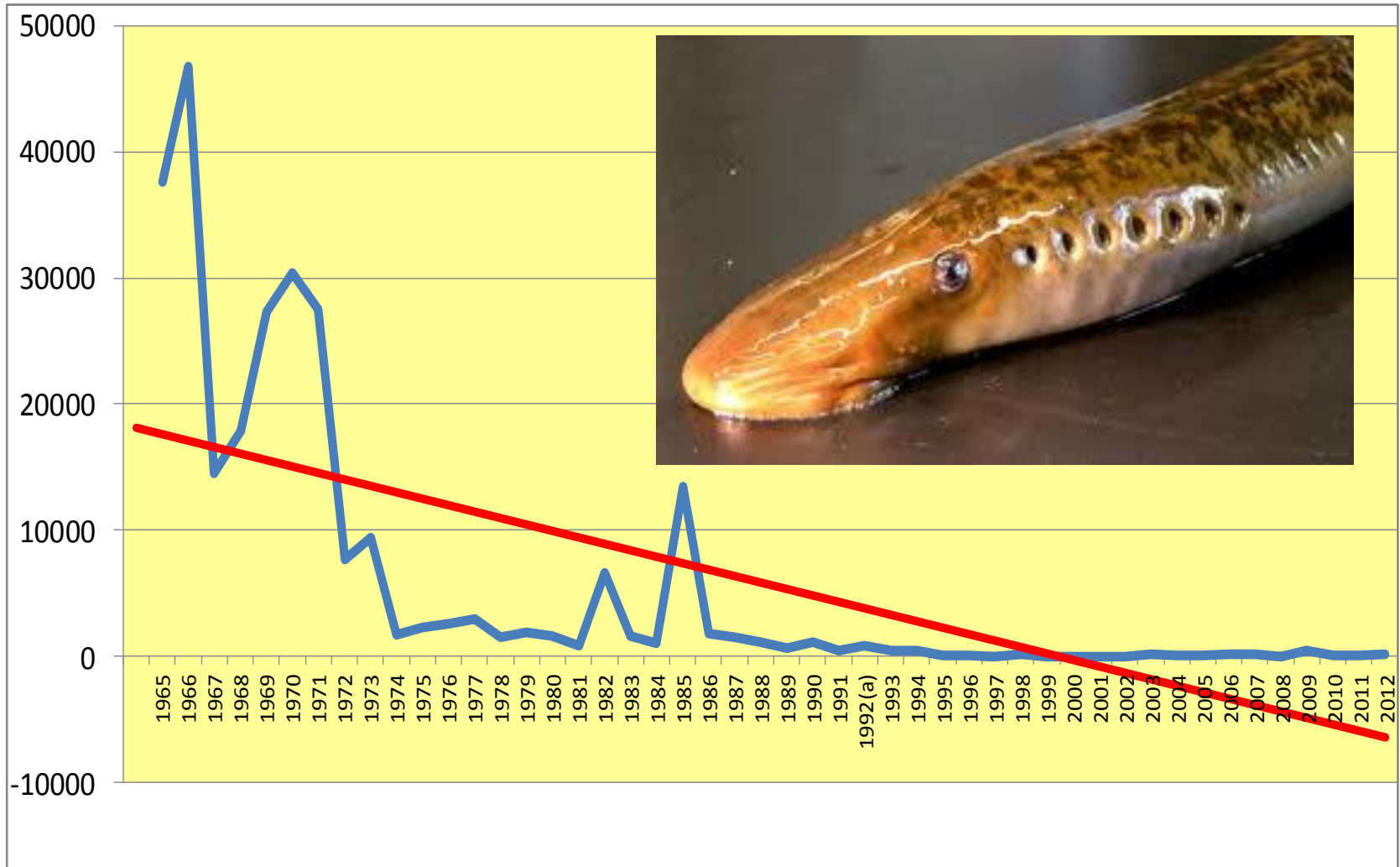
Cutthroat trout



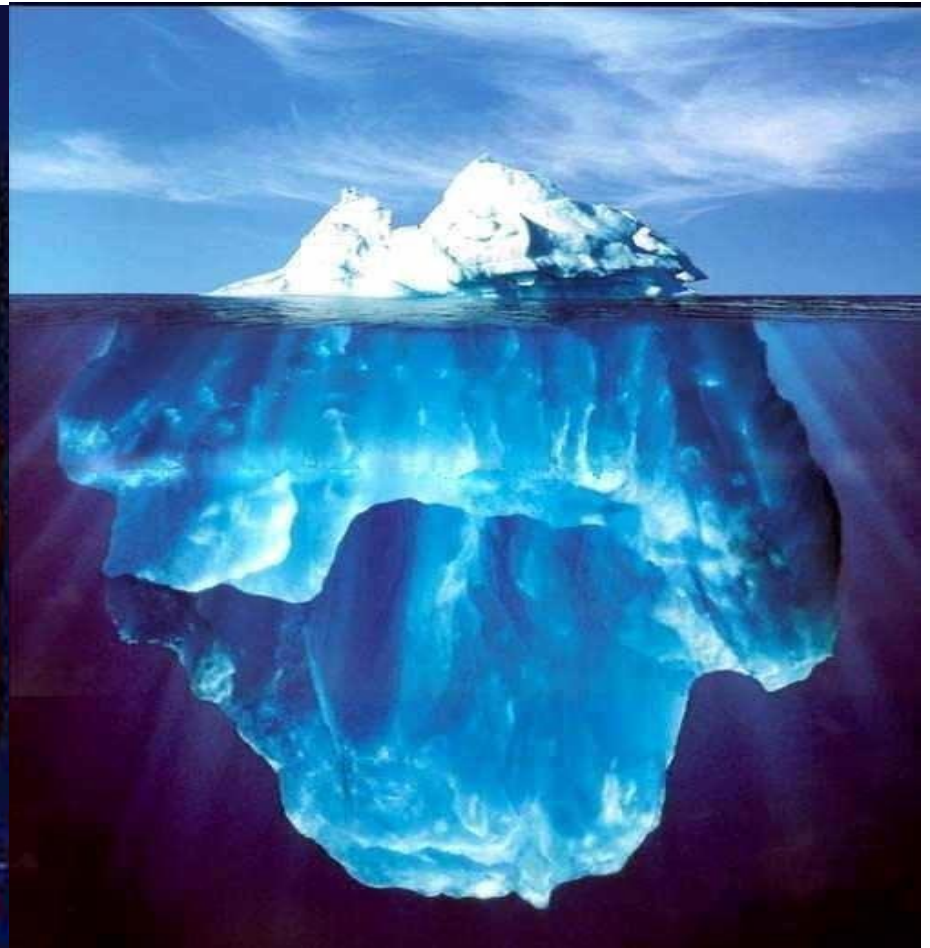


# Pacific Lamprey

## North Umpqua River, 1965-2012



# Harvest Rates Were A Problem: Current Fisheries Very Conservative



# MAXIMUM ALLOWABLE “IMPACT”

## Oregon Coast Coho Fisheries

1998-2014

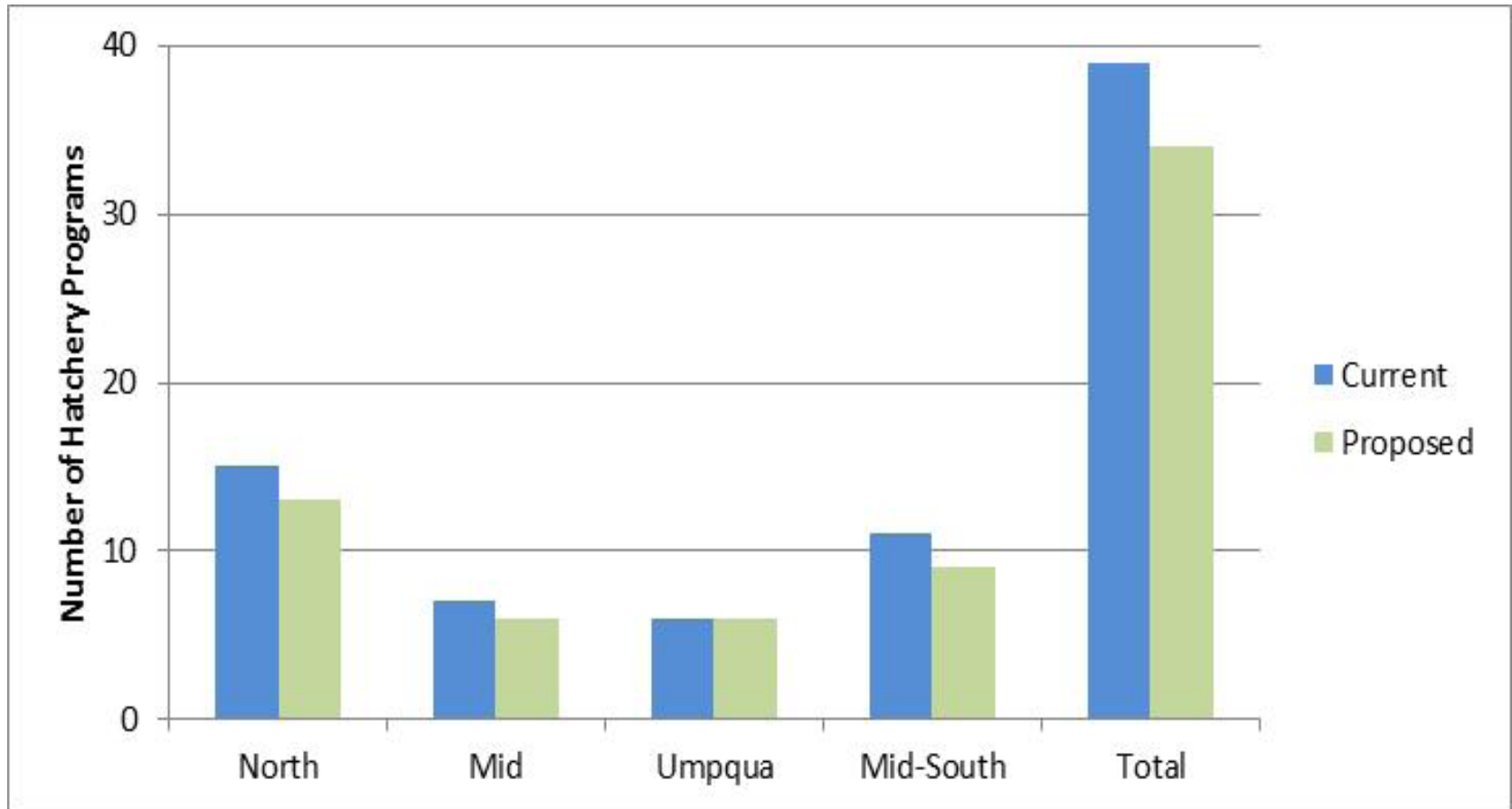
- **CRITICAL (0-8%) - 1998,1999,2000,2001,2008**
- **Extremely Low (<15%)- 2002,2003,2004,2005,2006,  
2009,2010,2011,2012,**
- **Low (<20%)- None**
- **Medium (<25%)- 2013,2014**
- **High (<38%)- None**
- **Extremely High (<45%)- None**

**Wild fish populations have survived in the past  
when fishing mortalities were 15%-25%**

# Hatchery Fish:

Not the single most major problem in the “Past”

Not the best option for restoring wild fish in the “Future”



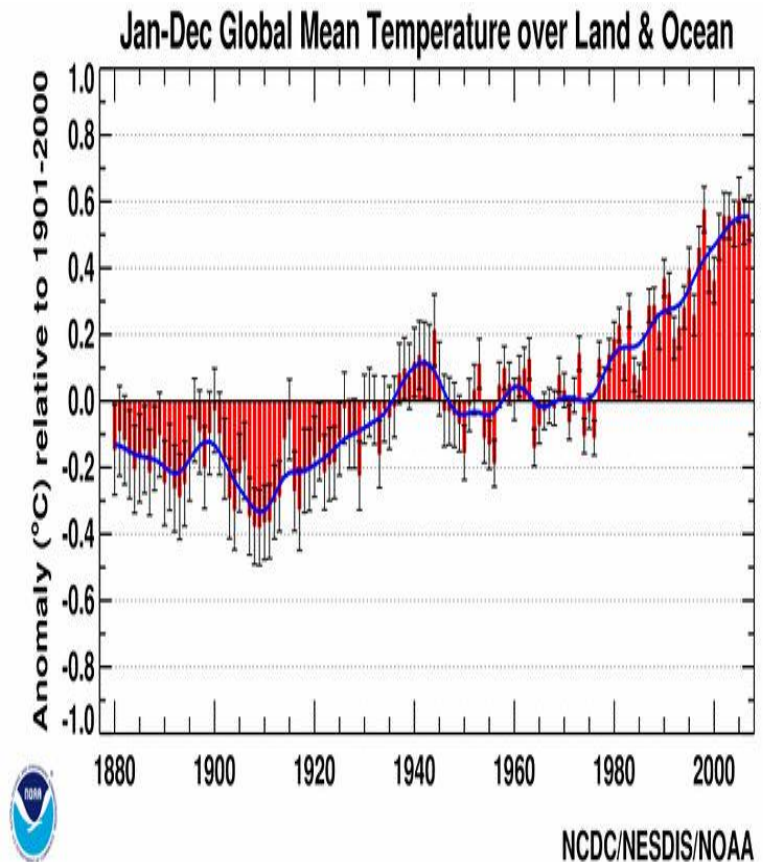
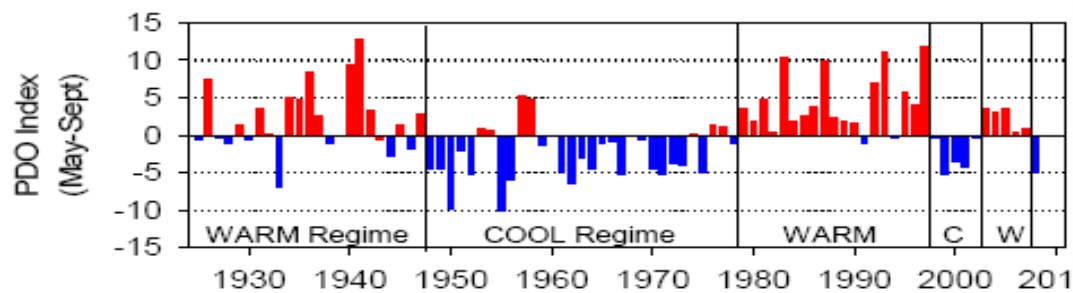
# Certain: Climate Change !!!

## Certainty: Foreseeable Prediction ???

Figure 2. Ocean Condition Index.

### Ocean condition index

From Bill Peterson- NOAA Fisheries: Sept. 2008





# MARINE SURVIVAL CATEGORY

## Oregon Coast Coho

1998-2014

- **Extremely Low-** 1998,2008
- **Low-**1999,2000,2002,2005,2006,2010,2011,2012
- **Medium-**2001,2003,2004,2007,2009,2013,2014
- **High-** None
- **Extremely High-** None

At 1% marine survival = 190,000 adult coho

At 3% marine survival = 570,000 adult coho

At 8% marine survival = 1,500,000 adult coho

**BOTH FISH AND HABITAT ARE IN OUR HANDS  
AND IT'S NOT A GAME WE WANT TO LOSE**



# FOCUS ON THE BEST"EST" AND THE MOST"EST"- TO ENSURE THE FUTURE IS THE HEALTHY"EST"

## FISH HABITAT- QUALITY + MILES = SUSTAINABILITY

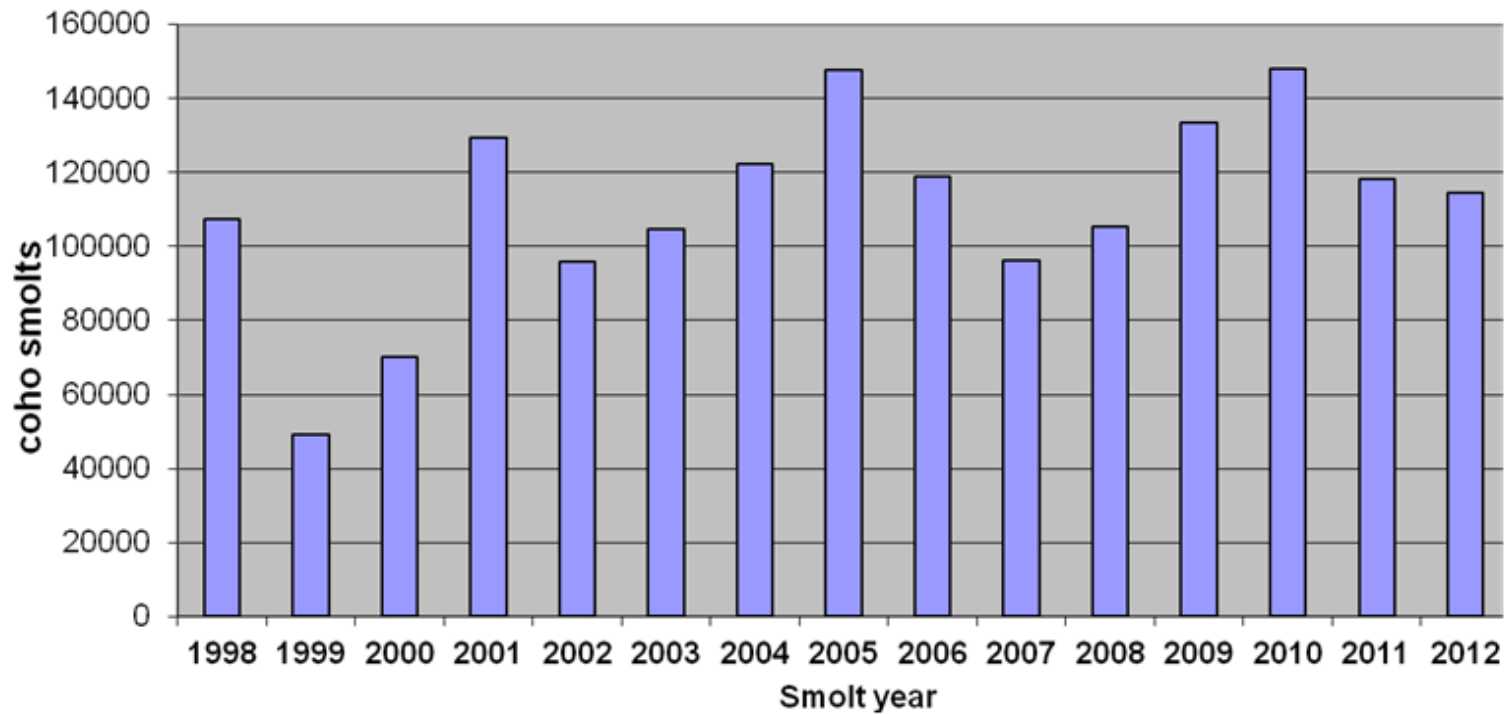
- **17%** of stream habitat is “**high quality**” (HQ)
- **62%** of potential smolt production is from **HQ** sections
- **7800 smolts/mile** from HQ habitat

## FISH ABUNDANCE- QUANTITY + MILES = PRODUCTIVITY

- 2100 smolts/mile average
- 2500 smolts/mile “ **20% Increase from Restoration?**”
- **7200 miles = 19 Million smolts vs. 15 Million smolts**

# WATERSHED HEALTH CHECK-UP

**Estimated wild coho smolt migrants at eleven coastal monitoring sites**





# Over the Course of Time: People, Fish, Watersheds

**WALK SOFTLY**



**AND CARRY A BIG FISH**

Parents don't frame pictures  
of their kids playing video games....



**TAKE THEM FISHING**



# Future Challenges- Responsibility

**Concern:** Analyzing only a single part of the animal or its past



**Approach:** Coordinate information from all sources and groups to address the challenge of complexity and diversity of fish populations

# Future Challenges- Quality

**Concern:** Our effects on fish habitat  
tend to be permanent,  
at least over ecological time frames



**Approach:** Follow disturbances in watersheds  
by gradual recovery  
of habitat fragmentation

# Future Challenges- Quantity

**Concern:** Significant loss of genetic diversity because of cumulative effects of small **fish** migration barriers

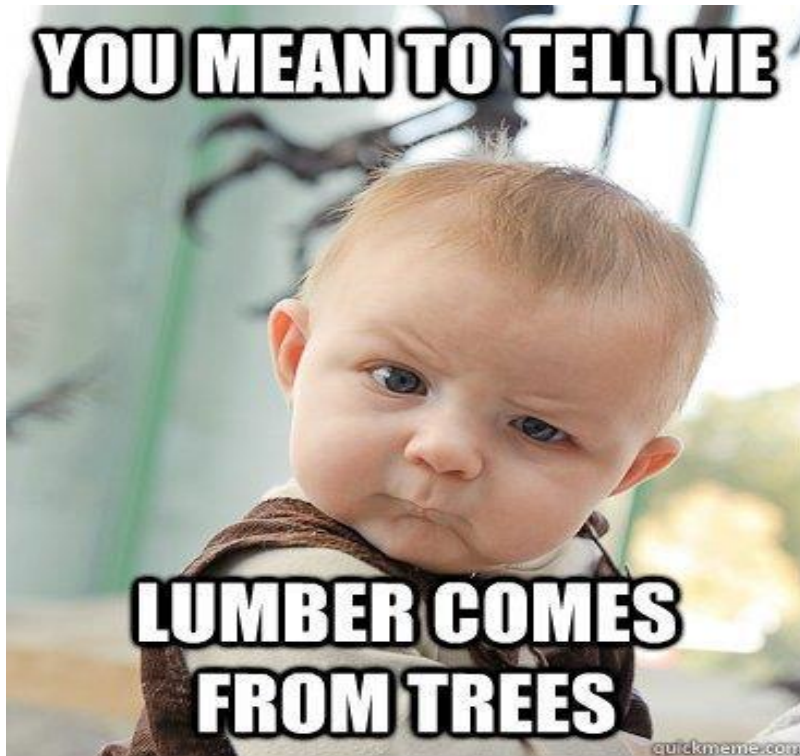


**Approach:** Reduce frequency of disturbance events, as well as magnitude

# Nature Deficit Disorder

“Last Child in the Woods” Richard Louv, 2005

Forested landscapes- Important to ecological and economic health



Naturehoods- Engage with nature through learning and exploration







**It is the long history of humankind  
(and animal kind, too) those who  
learned to collaborate and improvise  
most effectively have prevailed.**

**—Charles Darwin-ism**

# Salmon-ism



**What doesn't kill you  
Makes you stronger.**

**Except for bears,  
Bears will kill you**

Since light travels faster than sound, some people appear bright until you hear them speak.

