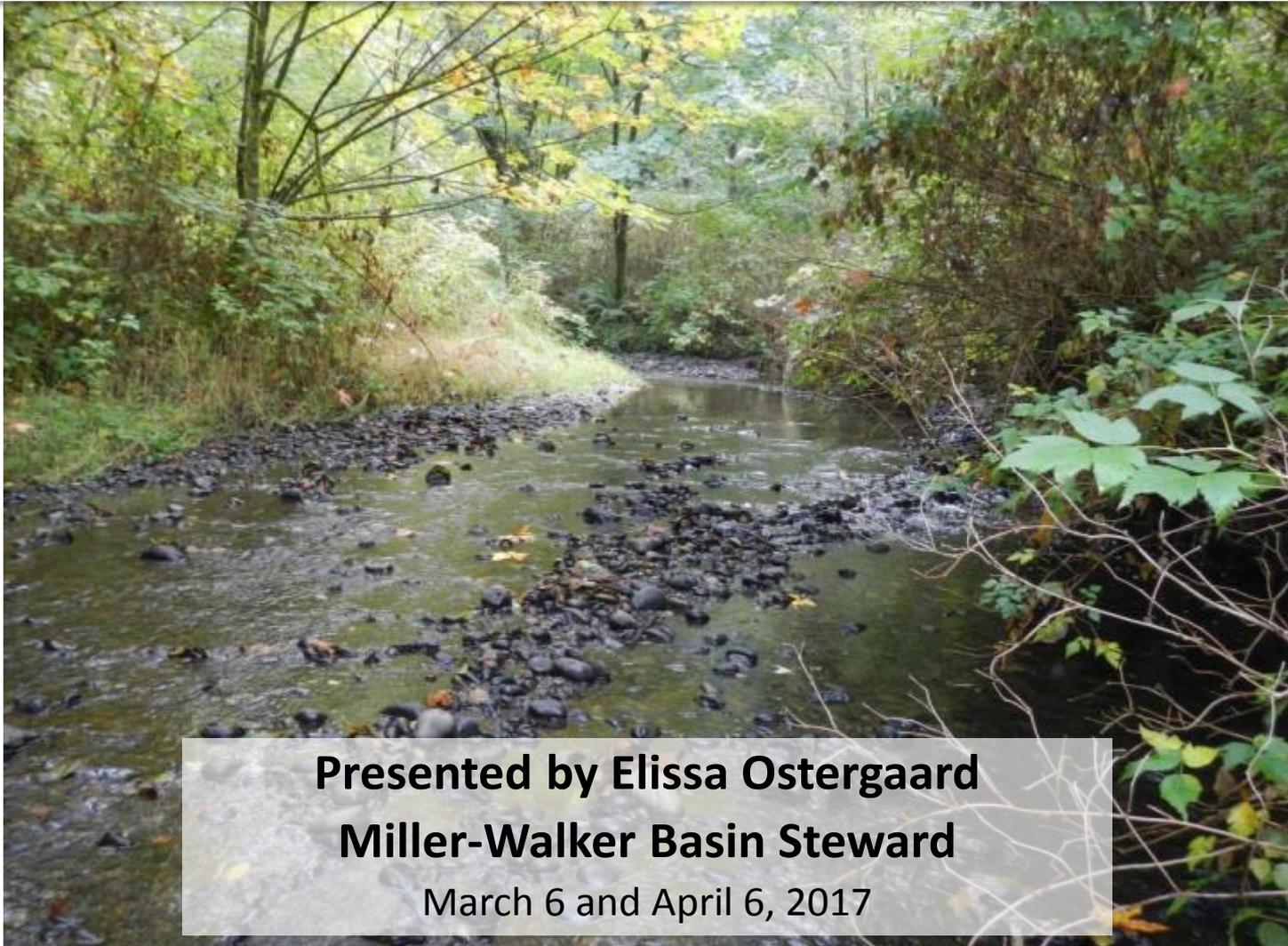
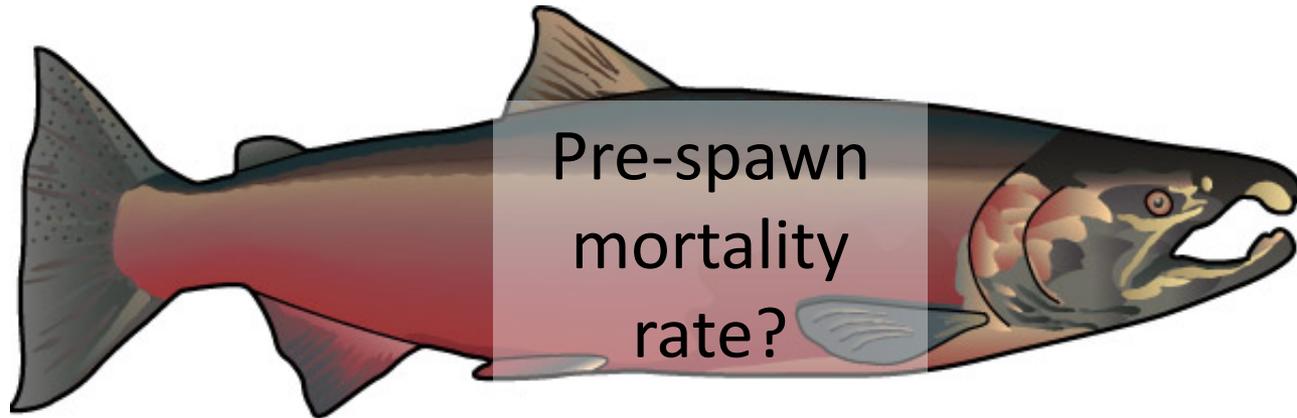


# Community Salmon Investigation (CSI) for Highline: 2016 Findings



**Presented by Elissa Ostergaard**  
**Miller-Walker Basin Steward**  
March 6 and April 6, 2017



# What percent of coho died before spawning in Miller and Walker Creeks in 2016?

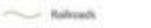
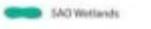
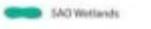
The “pre-spawn mortality” rate is the percent of returning adult female coho that died before spawning – as indicated by a dead fish that had a belly full of eggs and no sign of damage by a predator.

**Whoever guesses closest will win something “fishy”!  
Complete the slip and place in the orange bucket.**

# Basin Boundaries for Miller and Walker Creeks

**Puget Sound Starts Here**

## Legend

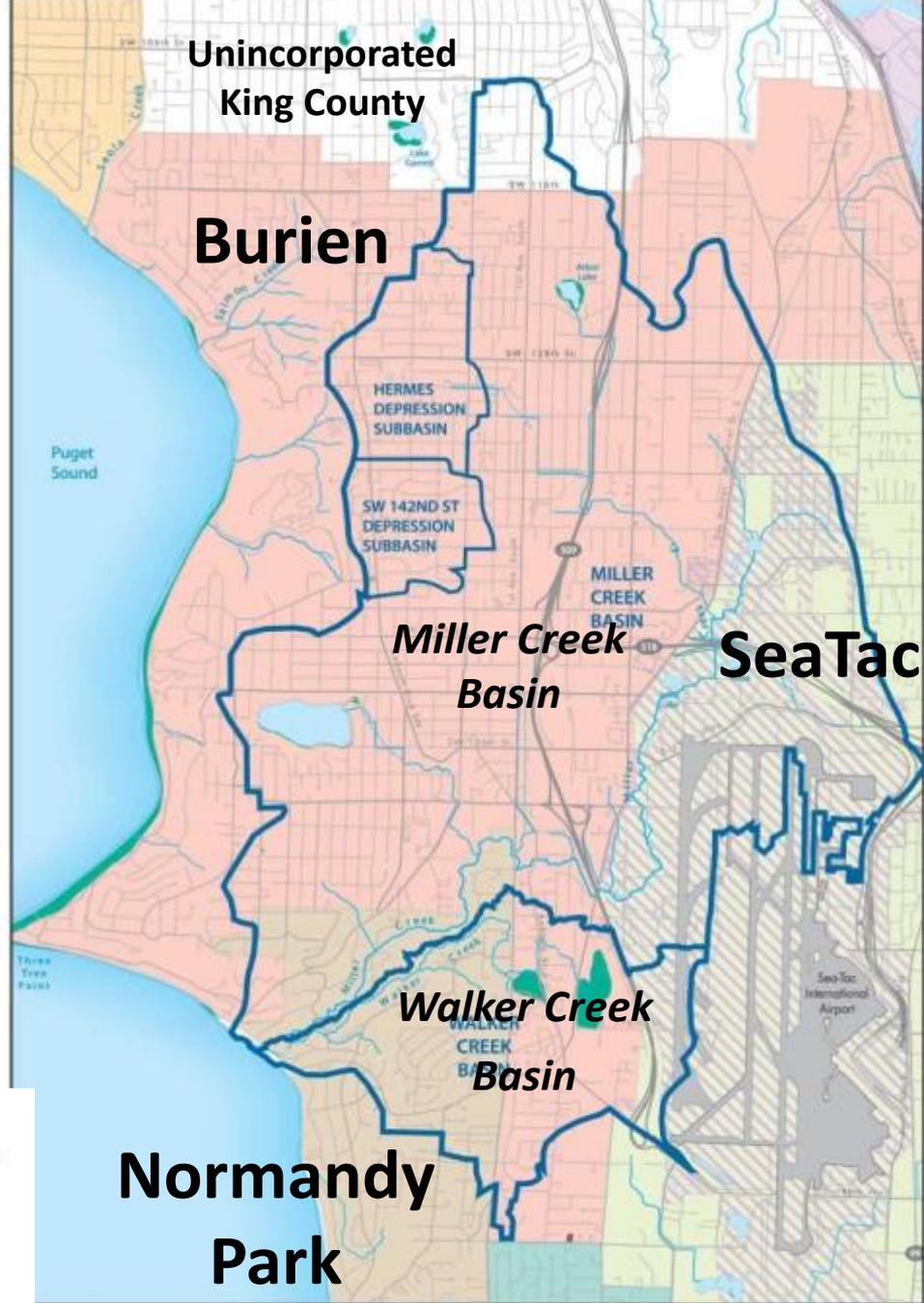
- |  |  |   |
|--|--|---|
|  Basin         |  King County (unincorporated) |  Basin Boundary                      |
|  Normandy Park |  Part of Seattle Property     |  Subbasin Boundary                   |
|  Seattle       |  Streams & Waterline          |  SAO Wetlands                        |
|  SeaTac        |  Pipes                        |  Other Significant Man-made Features |
|  Tukwila       |  Freeways & Arterials         |  Local Roads                         |
|  Des Moines    |  Railroads                    |   |



Basin Boundaries  
as shown on the map are based on  
the 2008 King County GIS.

Basin Boundaries  
were created by the Department of Ecology, King  
County Department of Natural Resources and Parks,  
King County Department of Public Works, and  
King County Department of Public Utilities.  
Revised from Department of Ecology, 2008.

**King County**  
Department of Natural Resources and Parks  
Water and Land Resources Division



Miller and Walker Basins

# Community Salmon Investigation for Highline - 2016 Results

1. Purpose of *Community Salmon Investigation: Highline*
2. How *CSI: Highline* works
  - Stream surveys
  - Necropsies
  - Survey locations
3. Results of October – December surveys
  - Summary data
  - Analysis
  - Weather and Wildlife
  - Thank you to volunteers
4. Plans for 2017
5. Factors affecting stream and salmon health
6. Our role!

# 1) Purpose of CSI



**Coho**

**October 27, 2015**

**Photo courtesy of Laura Milleville**

# Draft 2006 Basin Plan

## Recommendation on Monitoring

An on-going basin monitoring program should be started that will allow for trend analysis of:

- Stream flow (volume)
- Water quality
- Habitat data



**Port of Seattle water  
quality sampling station  
at Walker wetlands**

October 16, 2007

# Basin Monitoring Coordination Workshops with Dennis Clark, Fall 2008



**Monitoring Workshop #1 at  
Burien Community Center  
September 24, 2008**

**Monitoring Workshop #3  
in Burien  
December 4, 2008**



## Watersheds, rivers and streams

Central Puget Sound

You're in: [Central Puget Sound Watershed](#) » [Miller and Walker Creeks Stewardship](#) » [Monitoring Information](#)

Central Puget Sound Watershed

Vashon - Maury Island

Miller and Walker Creeks Stewardship

Stewardship Tips

Volunteer Calendar

Stream Blog

Miller Creek Photo Tour

Walker Creek Photo Tour

Basin Plan

Clean Stormwater

**Monitoring Information**

Salmon Monitoring Program - "CSI: Highline"

Contacts

Hydrologic Modeling

Nearshore environments

Puget Sound Shoreline Stewardship Guidebook

Related organizations

News archive

Site Map

To offer a suggestion or report an error on the Water and Land Resources' Web site, please contact [Fred Bentler](#), webmaster.

### Monitoring Information: How Are Miller and Walker Creeks Doing?

This page provides information on:

- [Current and Past Monitoring](#)
- [Community Salmon Investigation for Highline](#)
- [Monitoring Sampling and Analysis Plan](#)
- [Final Monitoring Coordination Recommendations](#)
- [Background Information on Monitoring Coordination Workshops in 2008](#)

### Current and Past Monitoring

[General flow, water quality and other stream condition monitoring in 2012-2013](#) (Adobe PDF, 2MB)

### Water Quantity (Hydrology or Flow)

#### [Stream Gage Information](#)

There are five active gages and additional inactive gages that record flow in Miller and Walker Creeks. At the King County website, type in the number "42" to list all gages on Miller and Walker Creeks. This Web site will allow you to display information in graph form to illustrate the dramatic peaks of stormwater runoff.

#### [Hydrologic Modeling](#)

While not a source of current data from the stream, this page provides background on how land uses affect flow in the streams by influencing the volume of stormwater runoff.

### Water Quality

[2012 Miller Creek Water Quality analysis for Prespawn Mortality - King County](#) (Adobe PDF)

[Miller Creek Water Quality Information - Department of Ecology](#)

[Walker Creek Water Quality Information - Department of Ecology](#)

### Habitat Quality

Miller and Walker Creeks Basin Plan - Appendix C: Habitat Characteristics and Identified Problems of Miller and Walker Creeks

### Miller and Walker Basin Stewardship Sponsoring Jurisdictions

- [City of Burien](#)
- [City of Normandy Park](#)
- [City of SeaTac](#)
- [King County](#)
- [Port of Seattle](#)

### Miller-Walker Creek Questions

- [Contact Elissa Ostergaard with questions about Miller and Walker Creeks, \(206\) 477-4792](#)

### Lake Burien Questions

- [Direct questions about Lake Burien, including toxic algae testing, to Sally Abella, \(206\) 477-4605](#)

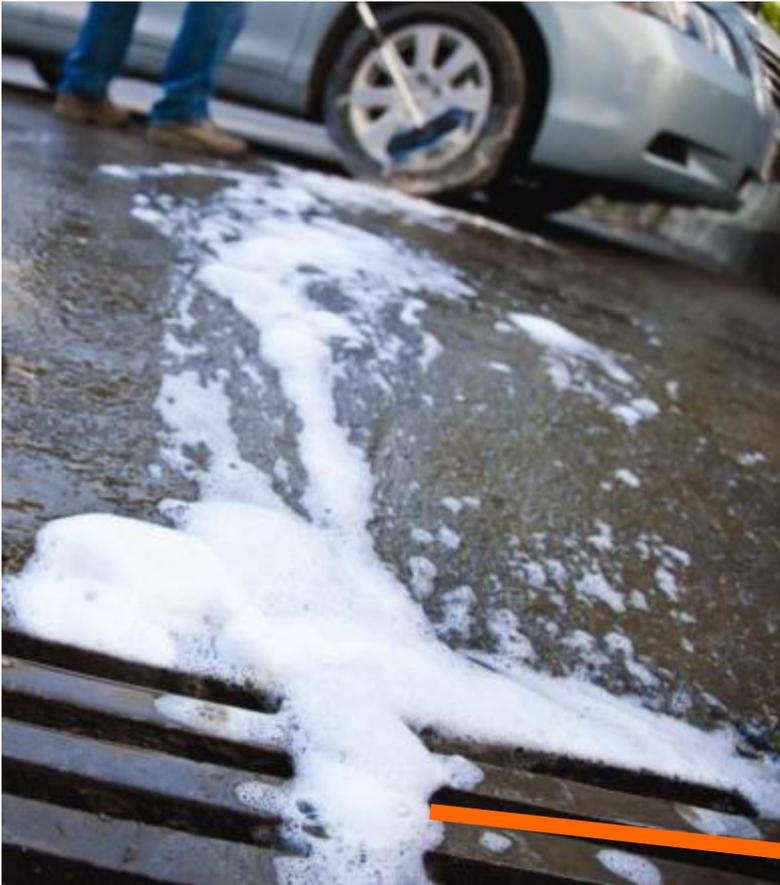
# Why do *CSI: Highline*?



- Count adult salmon – indicators of the health of the ecosystem
- Document rate of coho “pre-spawn mortality” to see how pollution prevention helps
- Raise the awareness about the streams in the community



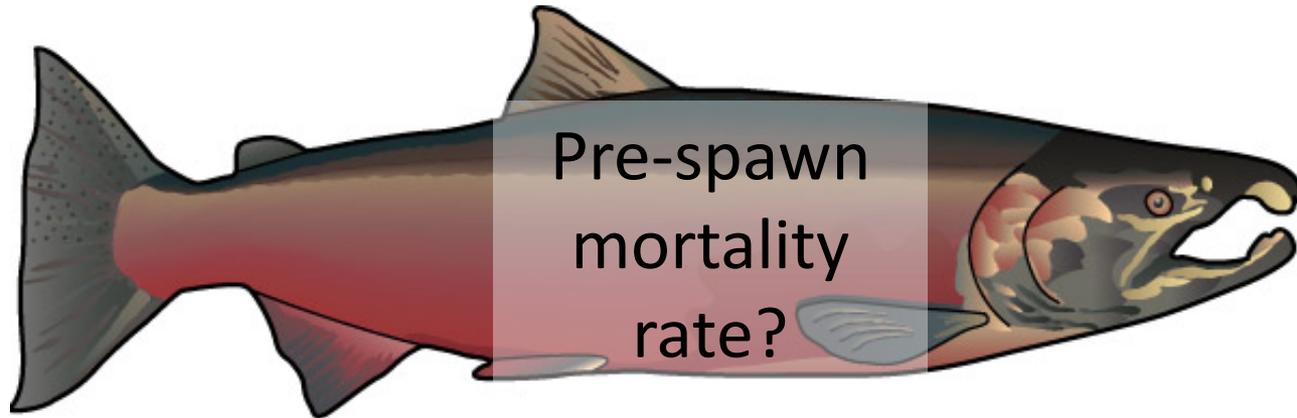
# Stormwater is not treated



# Testing highway runoff on adult coho



Photo courtesy of Tiffany Royal, Northwest Indian Fisheries Commission



# What percent of coho died before spawning in Miller and Walker Creeks in 2016?

The answer is some percentage between 0 and 100%.

The “pre-spawn mortality” rate is the percent of returning adult female coho that died before spawning – as indicated by a dead fish that had a belly full of eggs and no sign of damage by a predator.

**Whoever guesses closest will win something “fishy”!  
Complete the slip and place in the orange bucket.**

# 2) How CSI Works

- **Methods: *Survey Plan for Adult Fish Counting and Coho Prespawn Mortality in Miller and Walker Creeks***
- **Methods developed by NOAA, National Marine Fisheries Service & U.S. Fish and Wildlife Service**
- **Examine dead female salmon for eggs (=not spawned) and video/photograph pre-spawn mortality symptoms**

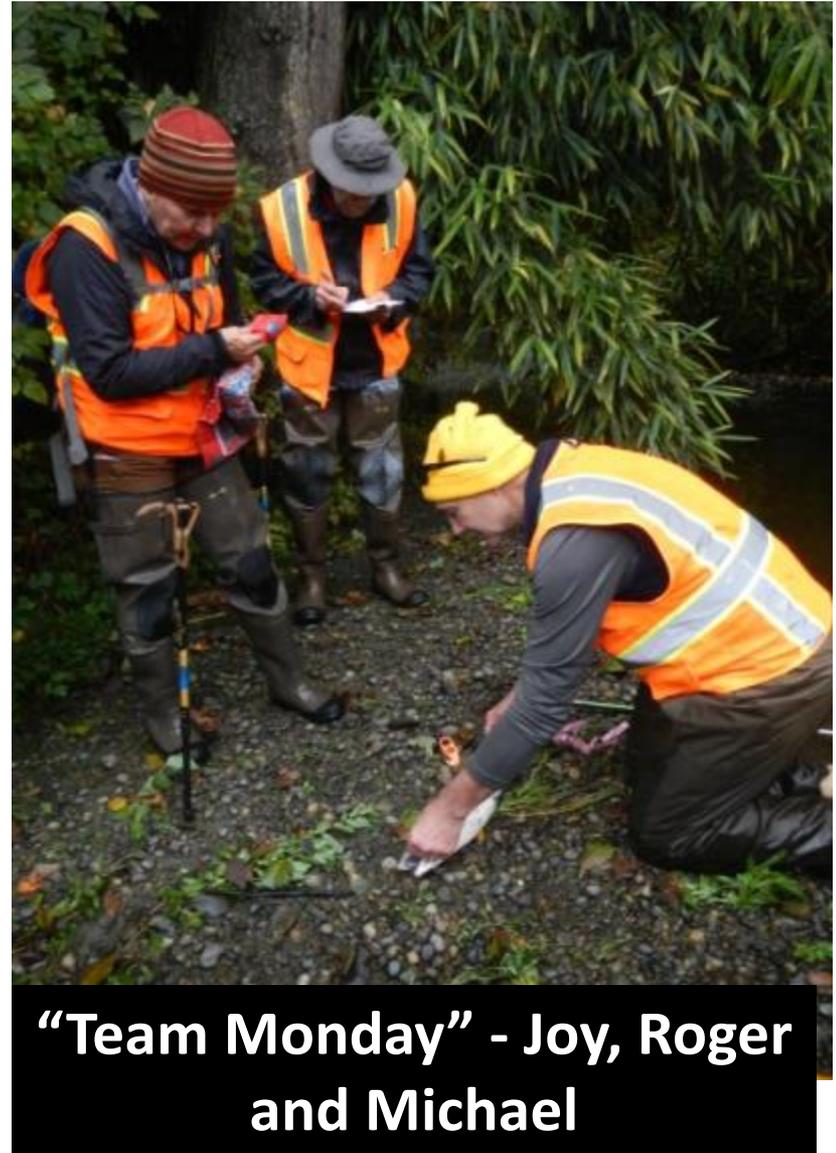


**“Team Wednesday” Brenda and Dahli survey Miller Creek**

**October 8, 2015**

# CSI “Cast”

- 31 volunteers from Burien, Normandy Park, and Seattle
- Seven daily teams – one team for each day of the week
- Teams had 2-6 people – some surveyed weekly, some every other week
- Backups filled in



**“Team Monday” - Joy, Roger and Michael**

# CSI Orientation Workshop

**Staff from NOAA or US Fish & Wildlife  
teach necropsy techniques**

Steve Damm, U.S. Fish & Wildlife Service, October 7, 2010



# CSI *Style*

**Polarized sunglasses for fish spotting**

**Back pack for supplies**

**“Team Tuesday” Kay modeling survey attire on Miller Creek**  
Photo courtesy of Pam Silimperi

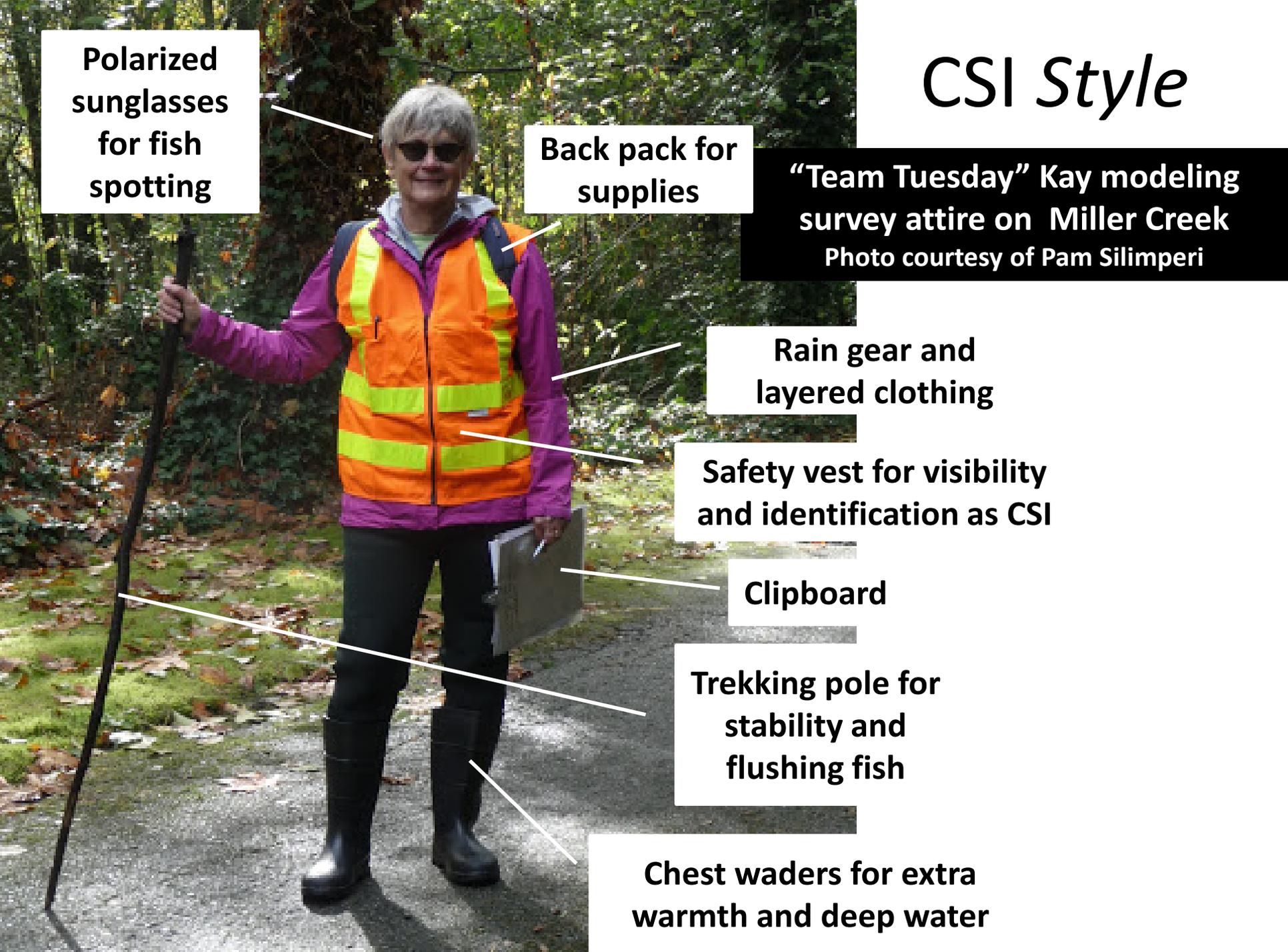
**Rain gear and layered clothing**

**Safety vest for visibility and identification as CSI**

**Clipboard**

**Trekking pole for stability and flushing fish**

**Chest waders for extra warmth and deep water**



# CSI in Action



**“Team Friday” Ed along  
Lower Miller**

**2015**

# CSI in Action

**“Team Tuesday” Liesl  
taking notes**

**Photo courtesy of Kristine  
Feldman, 2016**



# CSI in Action

**Male and female coho  
on Upper Miller Creek**

**October 14, 2011**

**Photo Courtesy of Ed Nugent**



# CSI in Action

**“Team Saturday”  
Ashley measuring  
a salmon carcass**

**Photo courtesy of Ashley  
Townes**



# CSI in Action

**“Team Tuesday” Pam  
cutting open the carcass**

Photo courtesy of Pam Silimperi/Kay Larsen



# CSI in Action

**Investigating egg retention –  
this female spawned!**

Photo by L. Moyer



# CSI in Action

**Investigating pre-spawn mortality – this is a male coho –  
note white milt sacs**



# CSI in Action

Each carcass was  
“marked” by cutting off  
the tail



# Collecting Coho Heads for Coded Wire Tags



Image from Alaska Department  
of Fish and Game

# CSI in Action – Teamwork!



**“Team Sunday” Drew,  
Jeremy and Nick**

Fall 2014

Photo courtesy of Robin Hoefer



**“Team Saturday”  
Meghan and Shelby**

2016

Photo courtesy of Meghan Schuster

# CSI in Action



**Coho swimming**

**November 10, 2016**

**Photo courtesy of Erik McDonald**

# Property Owner Permission

## Graciously Provided by:

- Clint and Kathy Adams
- Ann and Stephen Backstrom
- Linda and Thomas Beffa
- Brett Fish
- Mark and Sherri Henry
- RH Brecht Sandlian
- Susan Klein
- Normandy Park Community Club
- Normandy Park Swim Club
- Southwest Suburban Sewer District





# Survey Locations

- Four locations
  - Two on Miller Creek
    - Lower Miller – Sandlian, The Cove, and Adams property
    - Upper Miller – Sewer District and Fish property
    - (Above 1<sup>st</sup> Ave S. not surveyed – not many fish and difficult access)
  - Two on Walker Creek
    - Upper Walker – Beffa, Backstrom, Henry properties  
(shorter than past years)
    - Lower Walker – The Cove, Swim Club



# CSI Survey Locations Topographic Map of the Miller and Walker Creek Drainages

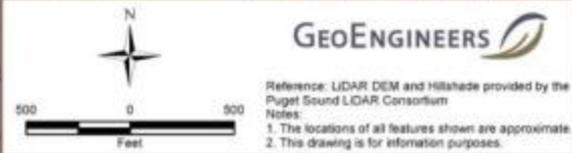
**Upper Miller  
Survey Location**

**Lower Miller  
Survey Location**

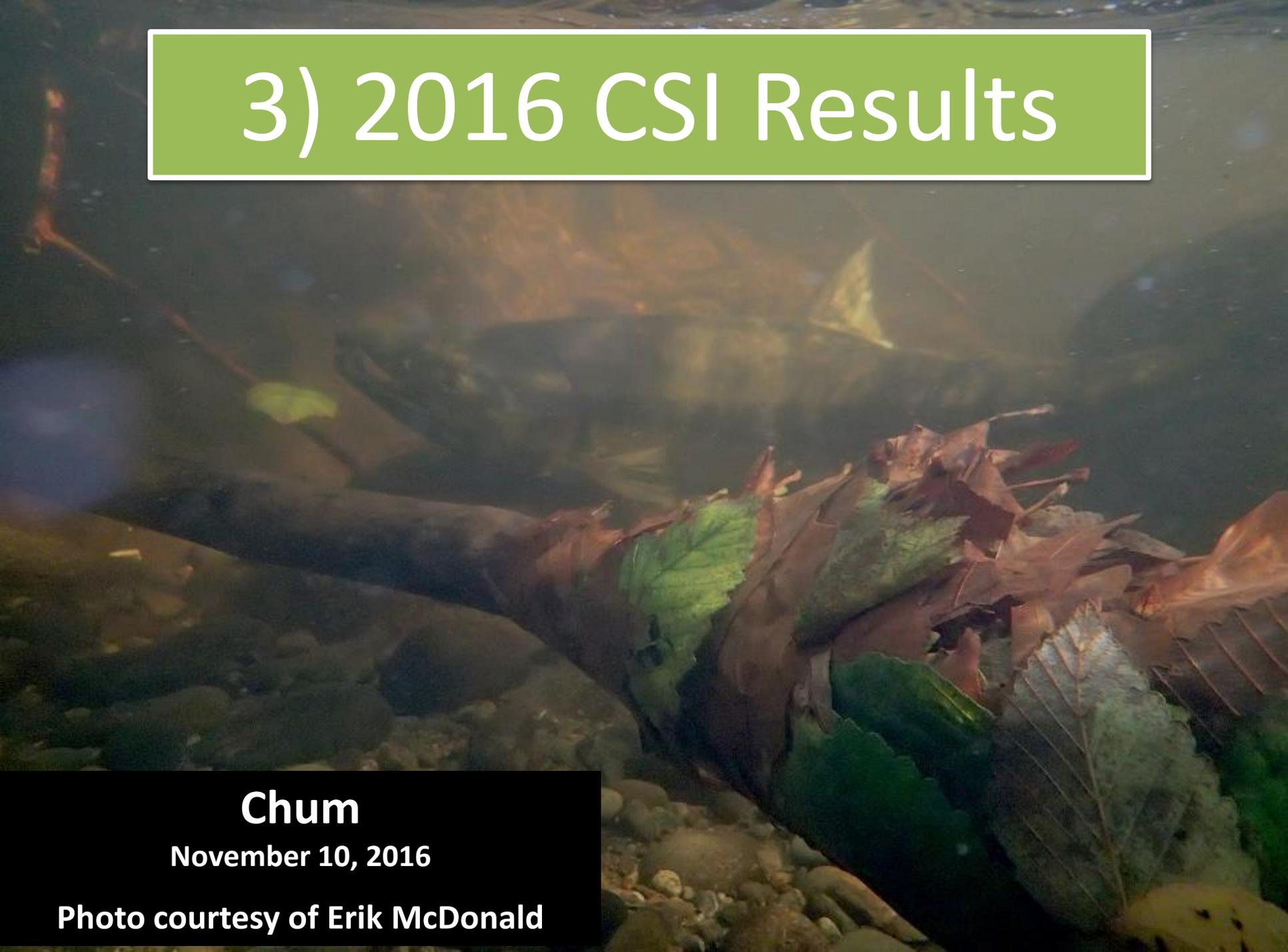
**Upper Walker  
Survey Location**

**Lower Walker  
Survey Location**

**First Ave South**



# 3) 2016 CSI Results

An underwater photograph of a chum salmon resting on a log in a stream. The fish is positioned horizontally, with its head to the left and tail to the right. The log is covered in a thick layer of fallen leaves, some of which are green and others are brown. The water is clear, and the background shows the rocky stream bed and some more logs.

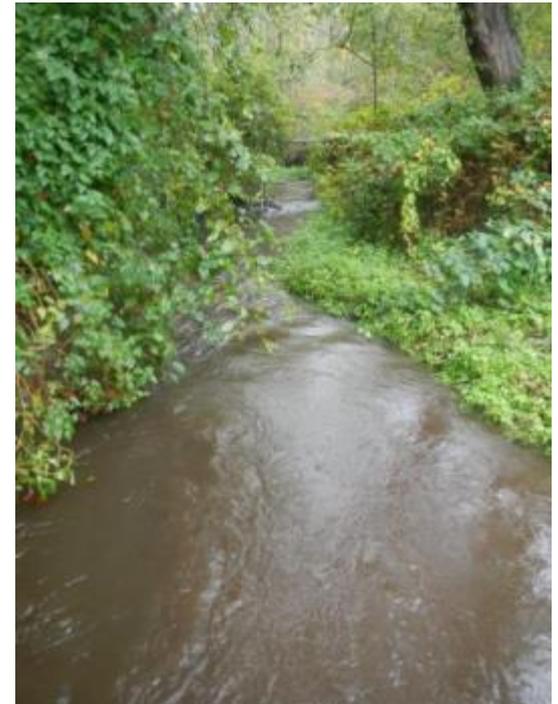
**Chum**

November 10, 2016

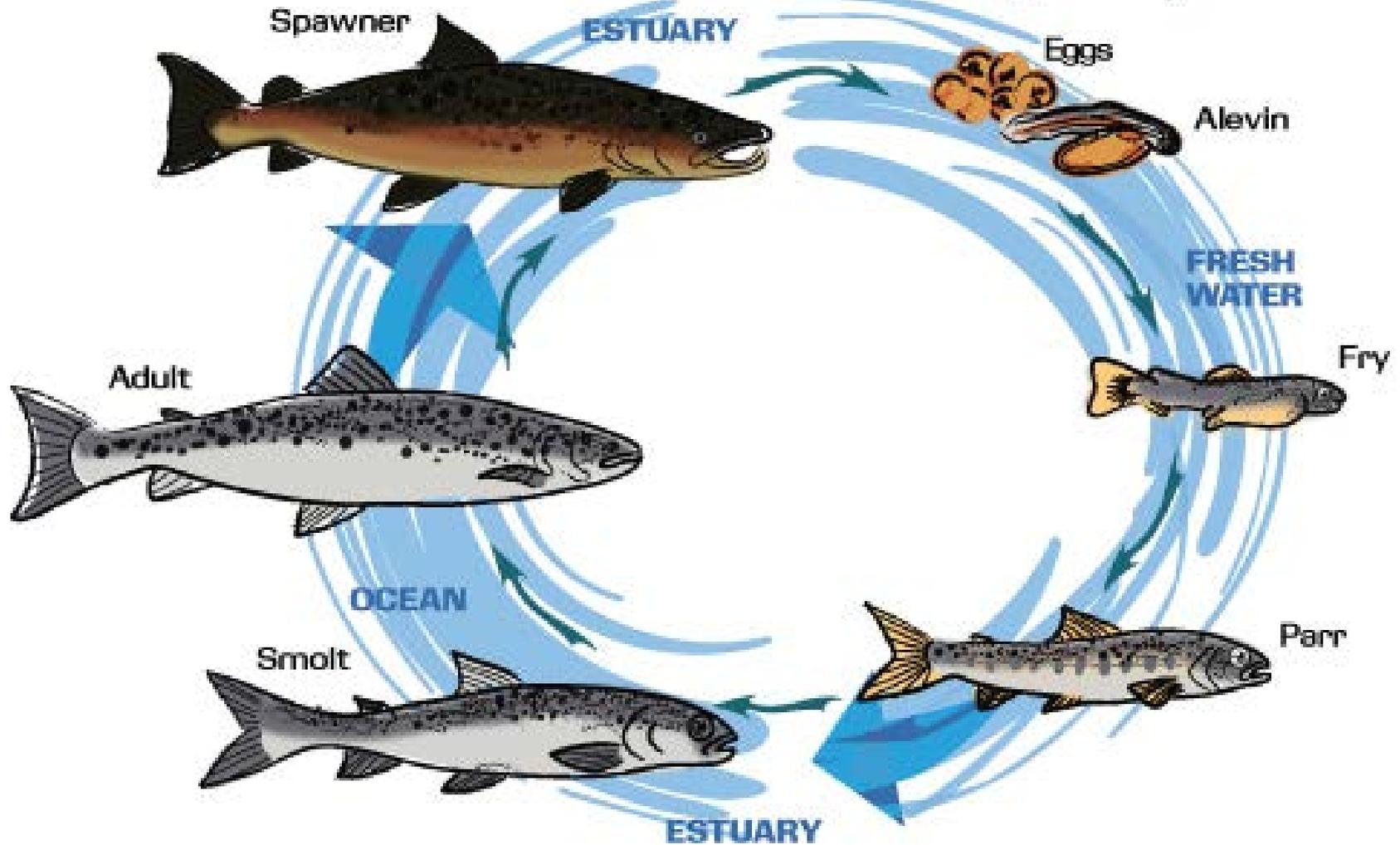
Photo courtesy of Erik McDonald

# CSI Survey Days

- Surveyed October 8 – December 19, 2016
- 73 days in season, surveyed 57
- Surveyed during daylight hours
- Days missed (15) for:
  - Rain & wind
  - High water, no visibility



# Life Cycle of the Salmon



# CSI Survey Locations Topographic Map of the Miller and Walker Creek Drainages

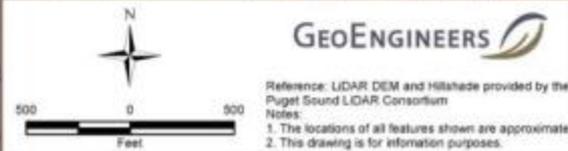
**Upper Miller  
Survey Location**

**Lower Miller  
Survey Location**

**Upper Walker  
Survey Location**

**Lower Walker  
Survey Location**

**First Ave South**



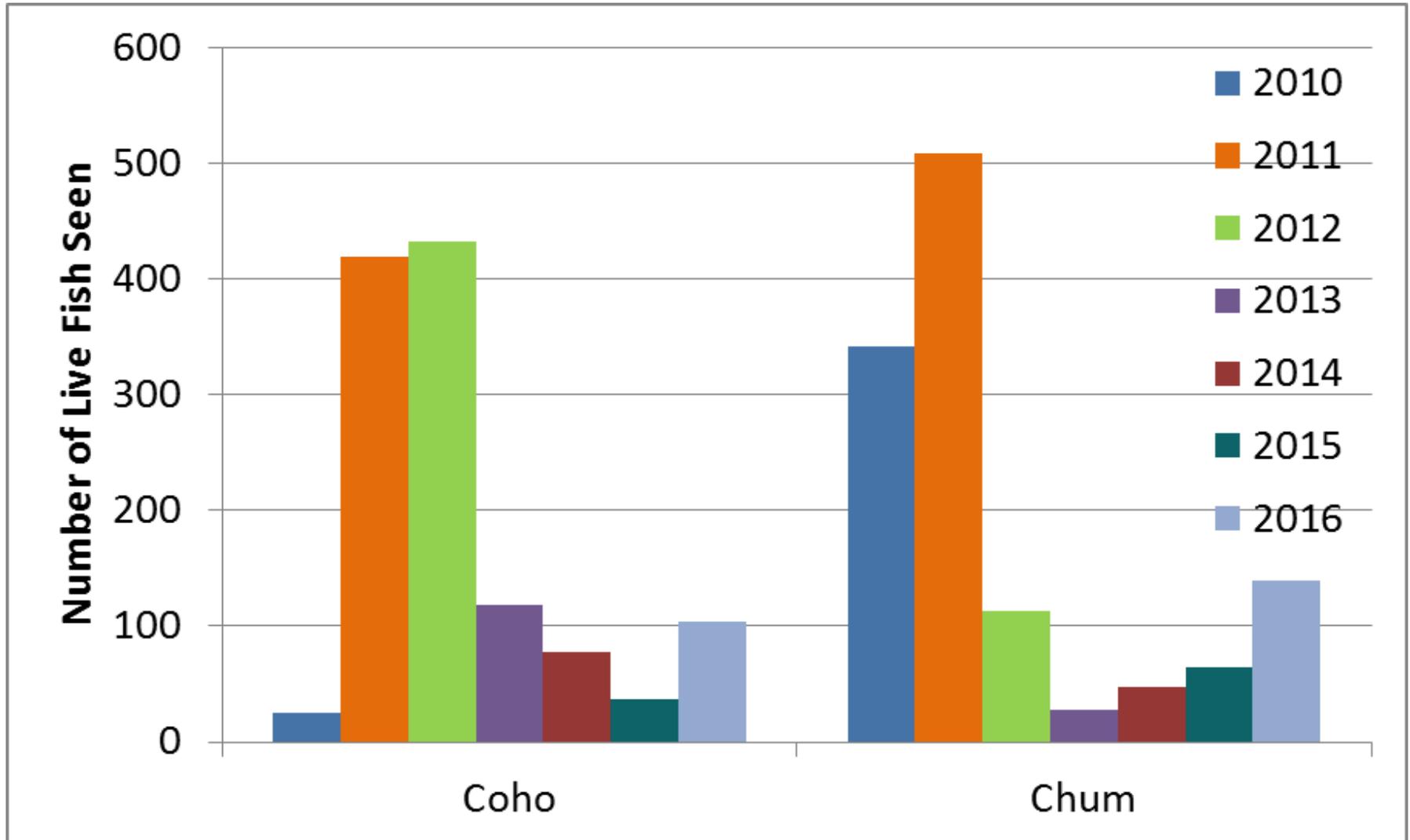
# Results: Live Fish Observations

Species	Coho 	Chum 	Unidentified Adults ??
Miller Creek	61	93	42
Walker Creek	43	46	11
<b>Total</b>	<b>104</b>	<b>136</b>	<b>53</b>

**GRAND TOTAL: 294 live fish seen**

Unidentified adults were 17% of total fish observed.

# Results: 2010-2016

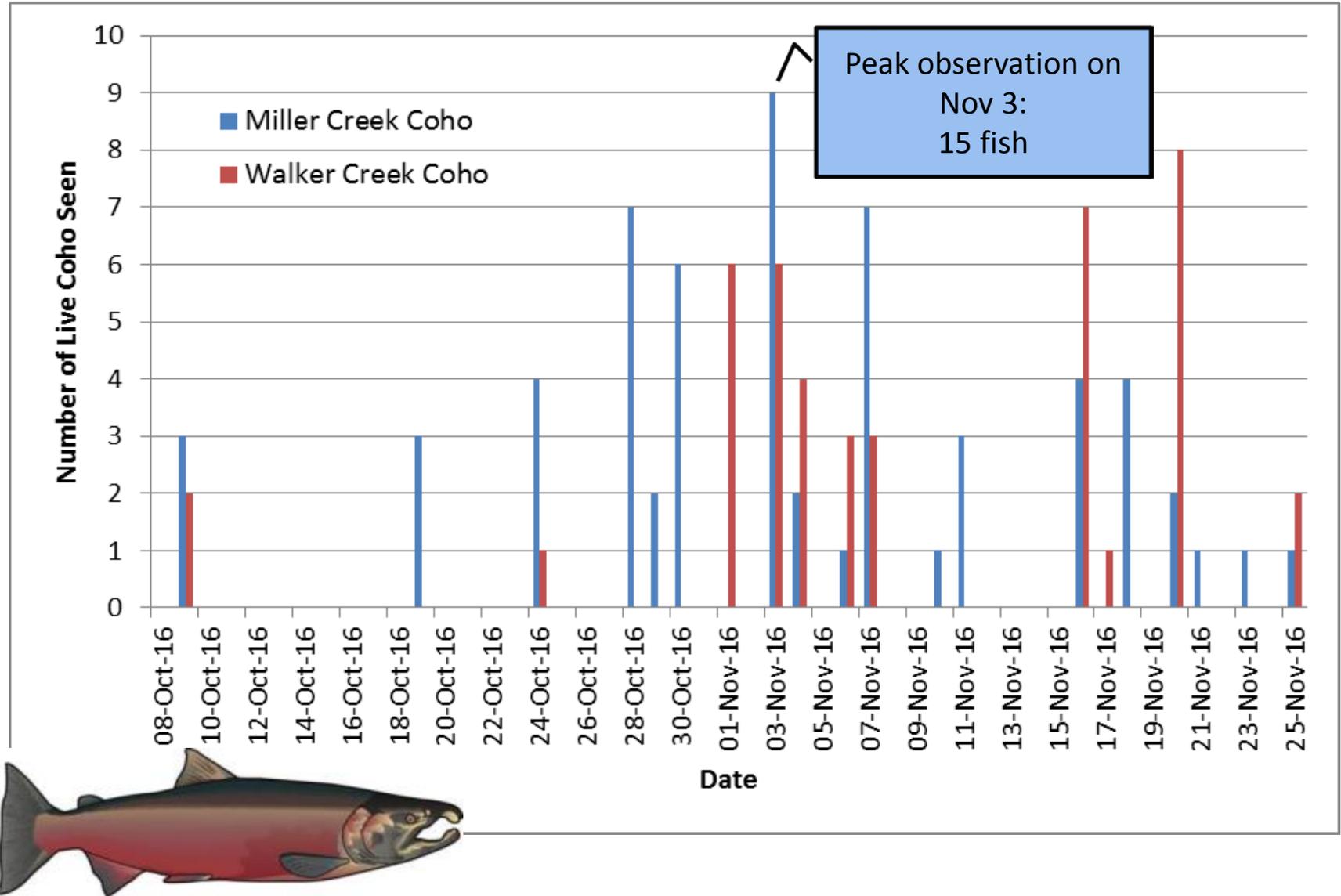




# Coho: 3-year Life History

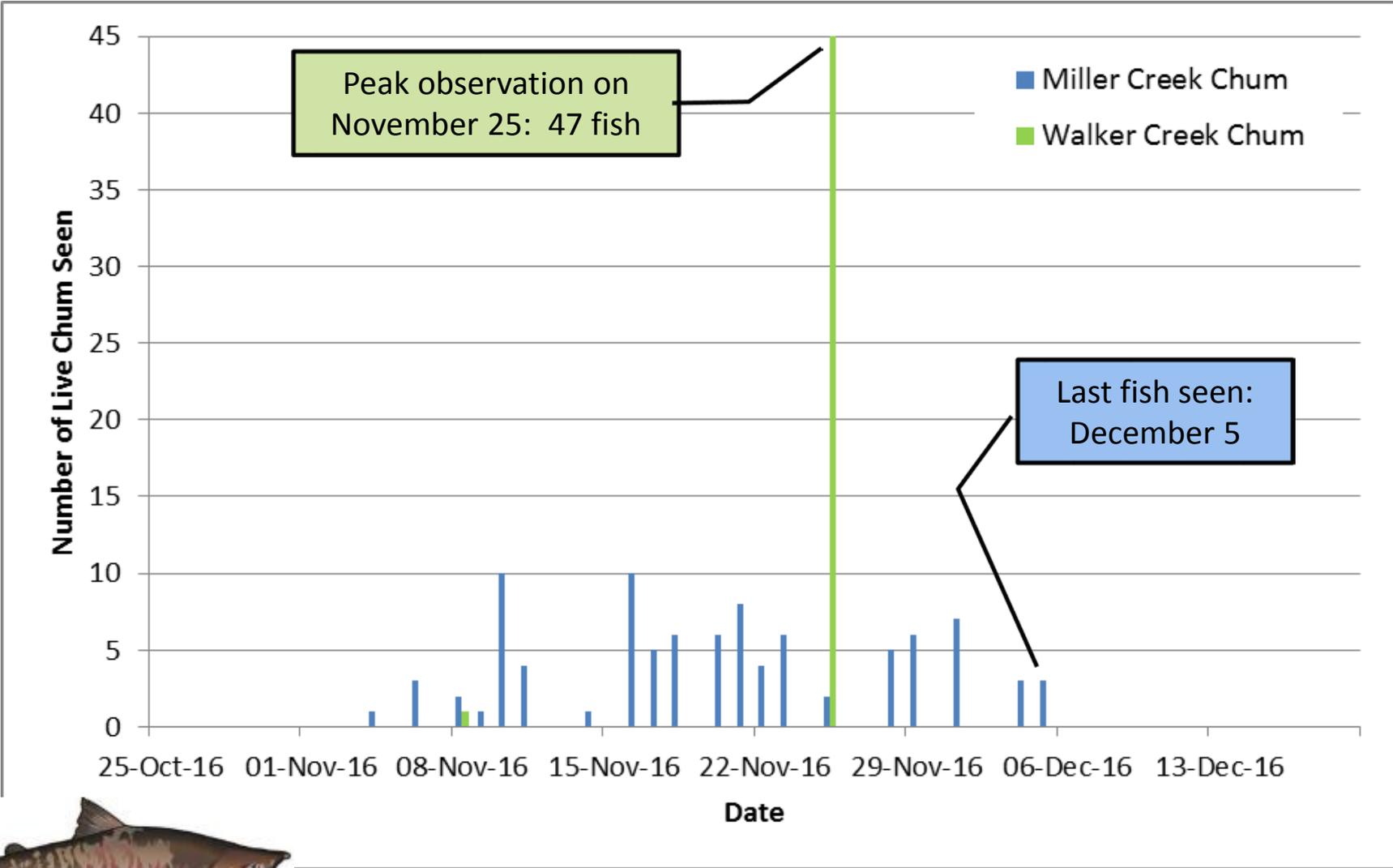
- October-Nov 2013 Spawned
- Early 2014 Hatched
- Early 2014 – early 2015 Rearing in stream
- Early 2015 Migration to salt water
- Early 2015– October 2016 Rearing in Puget Sound and Pacific Ocean
- October – November 2016 Migration upstream, spawning, death
- Early 2017 New fish hatch

# Results: 104 Coho Seen





# Results: 139 Chum Seen



# What affects fish numbers?

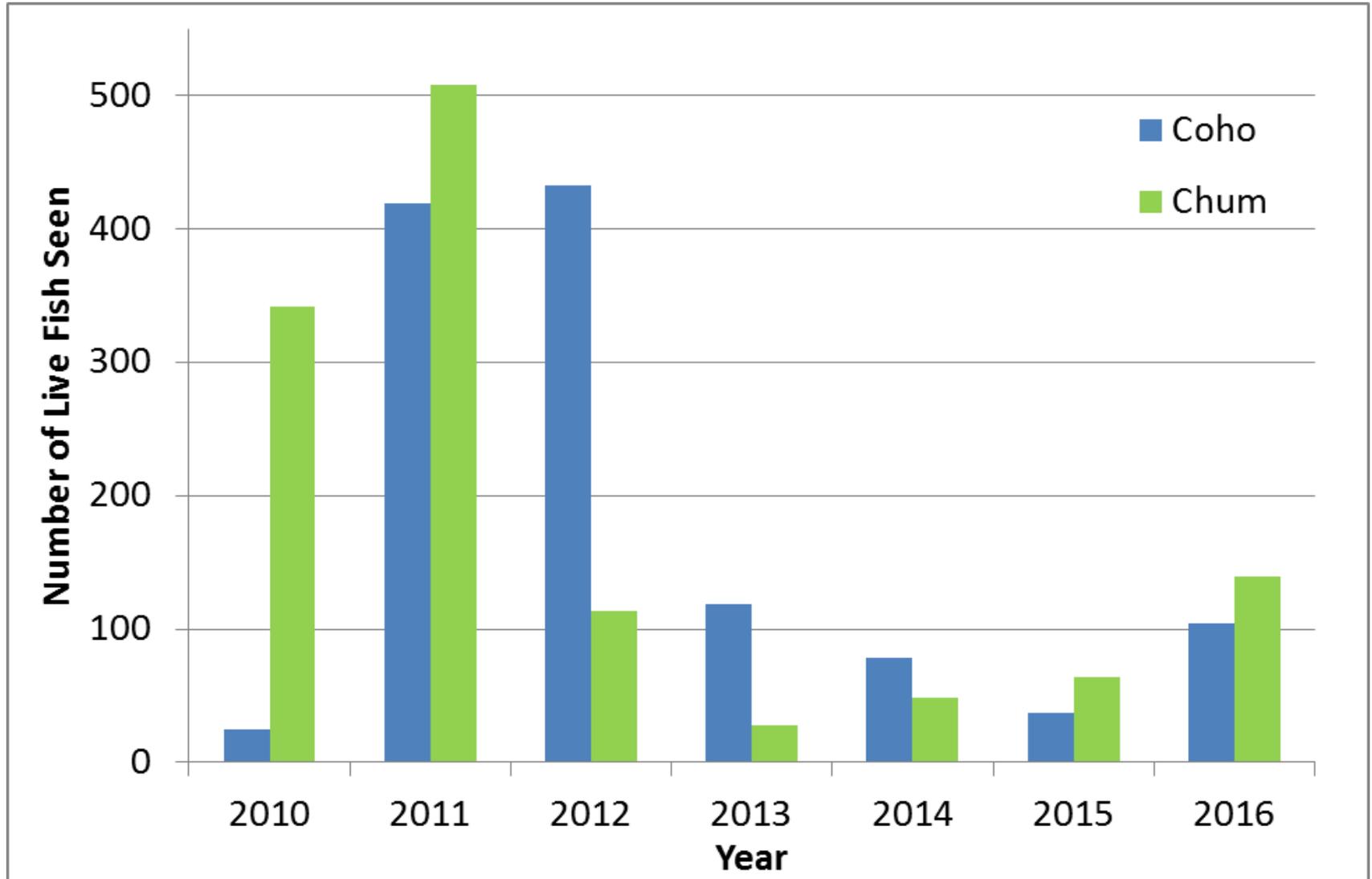
- Survival of eggs and young fish
  - Winter floods
  - Spring floods
  - Food available in creeks (coho)
  - Chemical contaminants
  - Predators
- Number of returning adults that spawn
  - Food available in Puget Sound/Pacific Ocean
  - Predators (marine and fresh water)
  - Water temperatures
  - Harvest rates
  - Chemical contaminants
  - Migration barriers



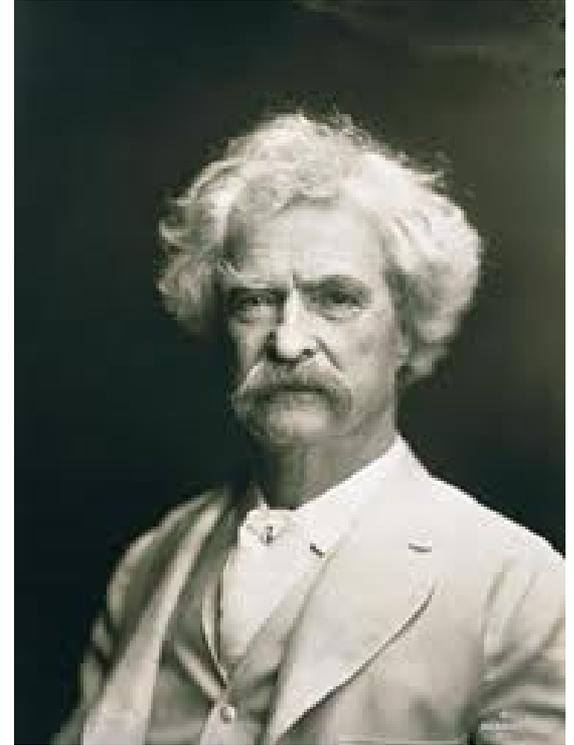
# Chum: 4-year Life History

- Nov. – December 2012 Spawning
- Early 2013 Hatched and migrated to salt water
- Early 2013 – Nov. 2016 Rearing in Puget Sound and Pacific Ocean
- Nov. – December 2016 Migration upstream, spawning, death
- Early 2017 Eggs hatch & migrate to Puget Sound

# Results: 2010-2016

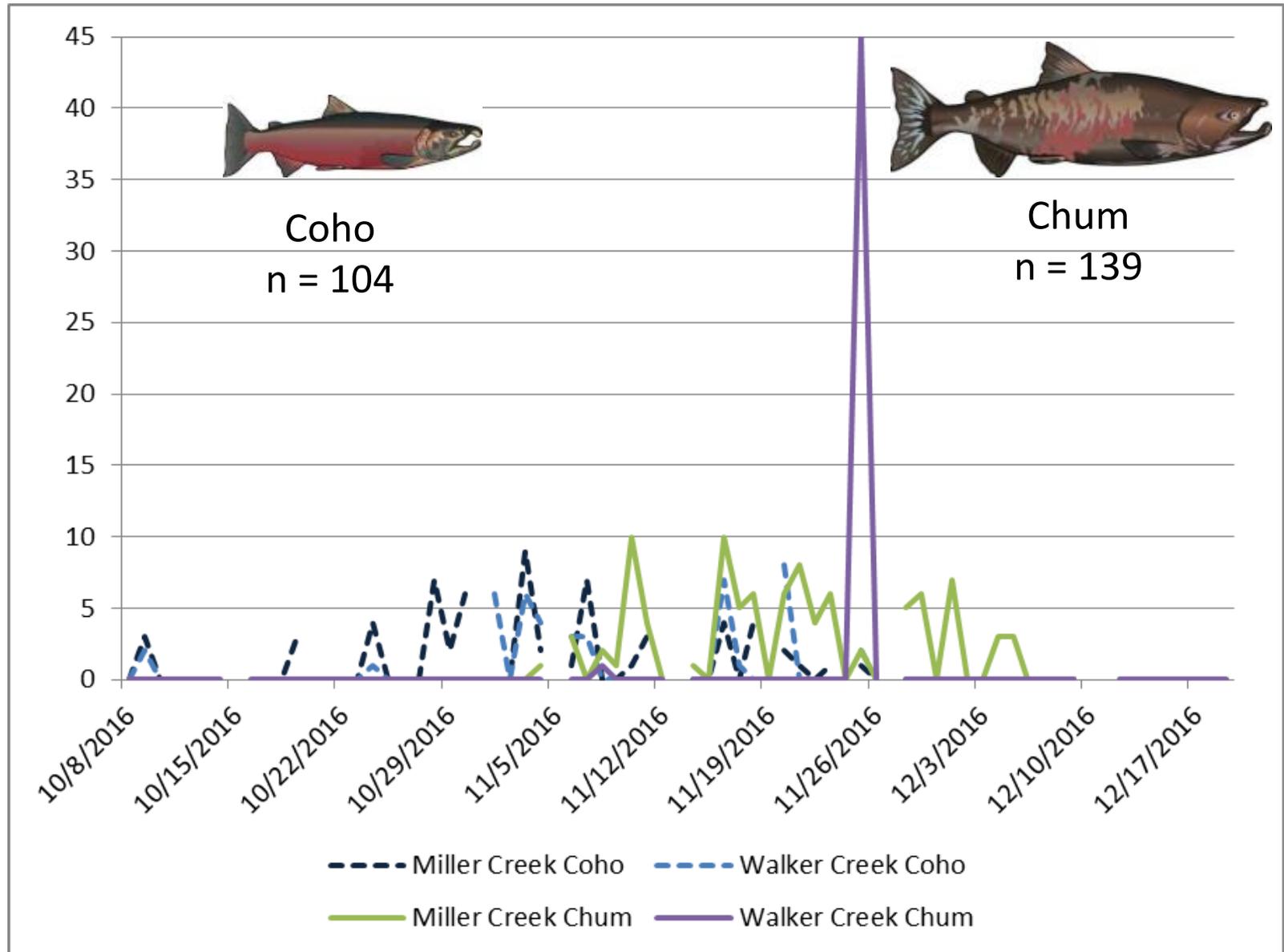


There is something  
fascinating  
about science.  
One gets such  
wholesale returns of  
conjecture out of  
such a trifling  
investment of fact.

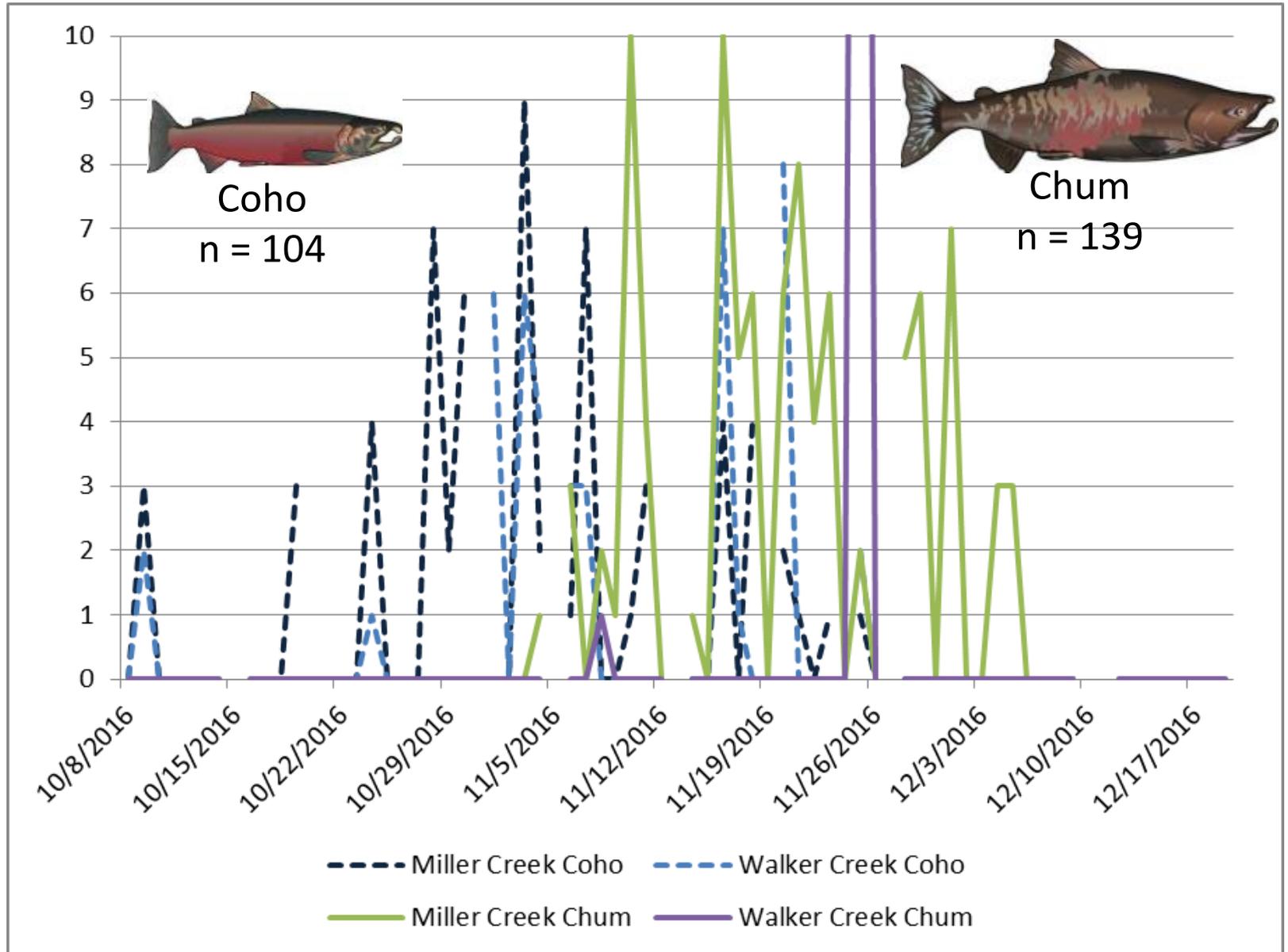


**Mark Twain**

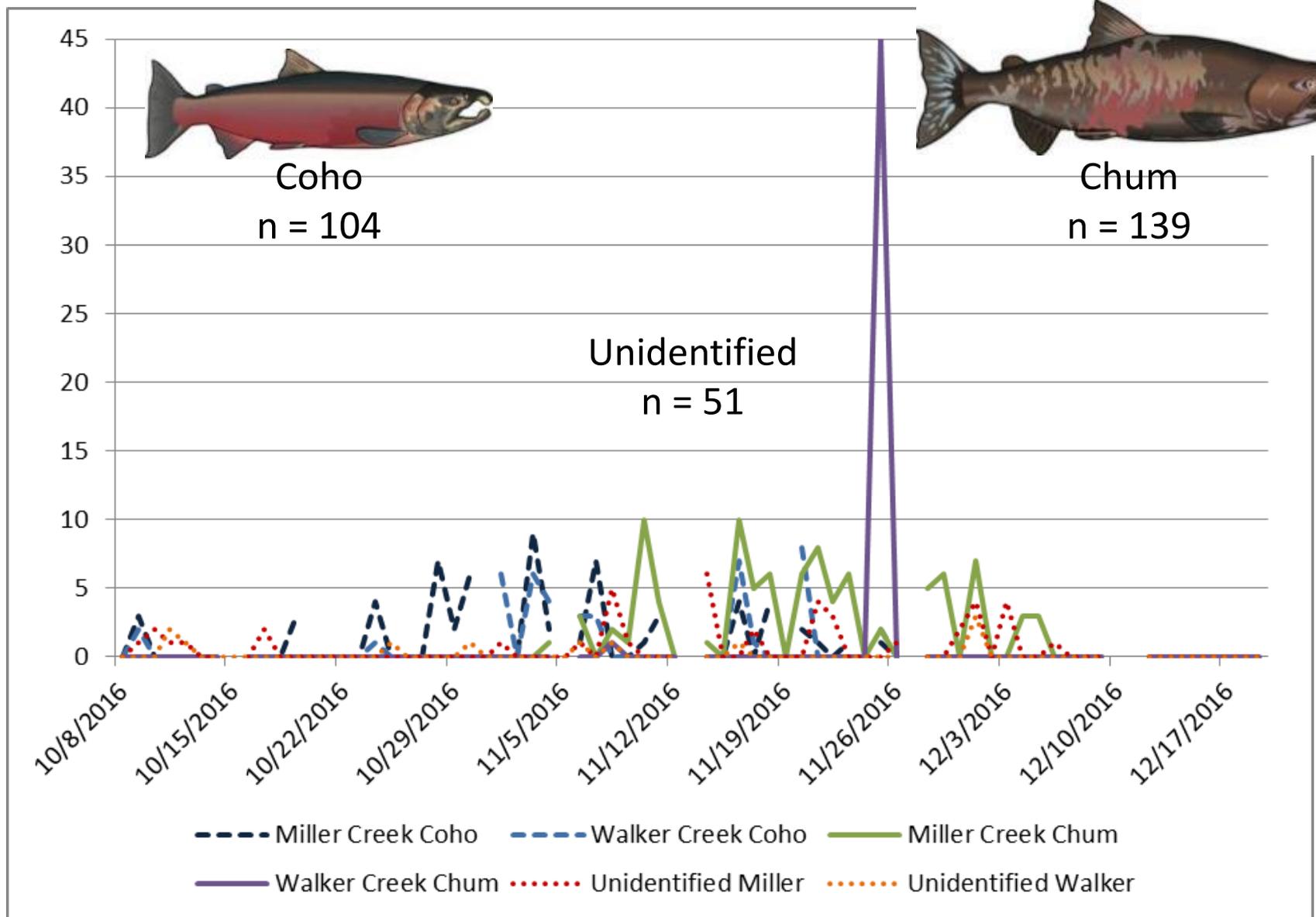
# Species by Stream



# Species by Stream



# Species by Stream



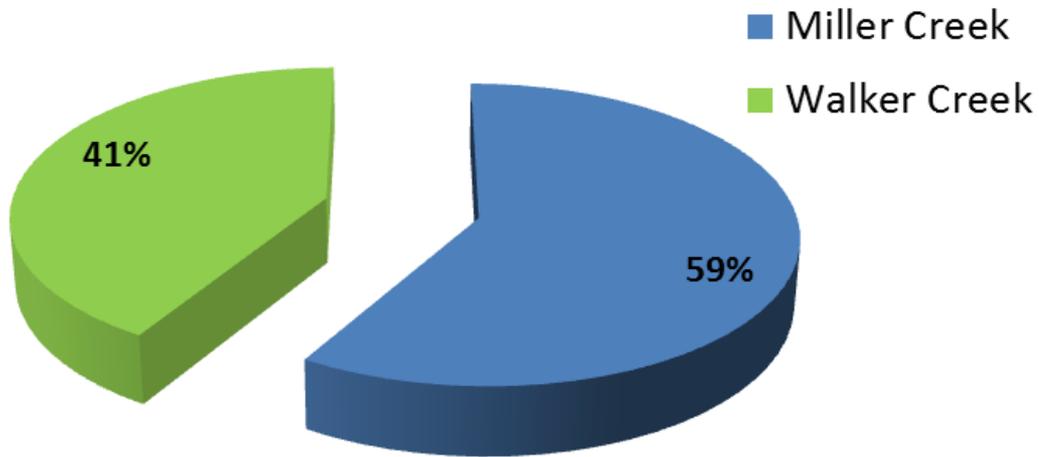


Walker Creek –  
partial blockage in  
2015 & 2016



# Species by Stream

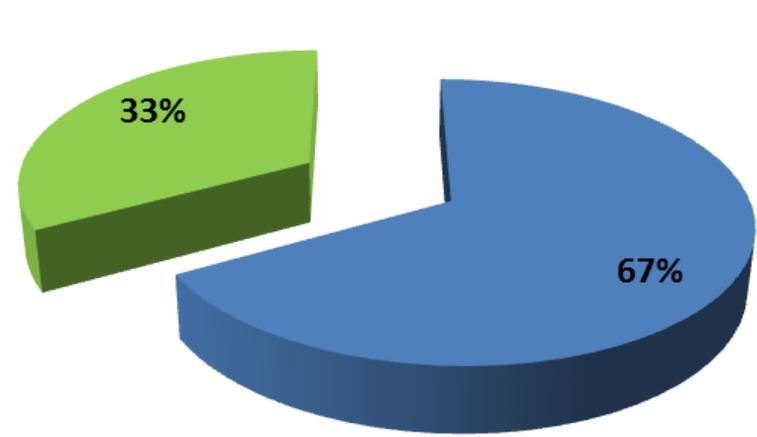
## Coho



n = 104



## Chum



n = 139



# Estimated *Population*

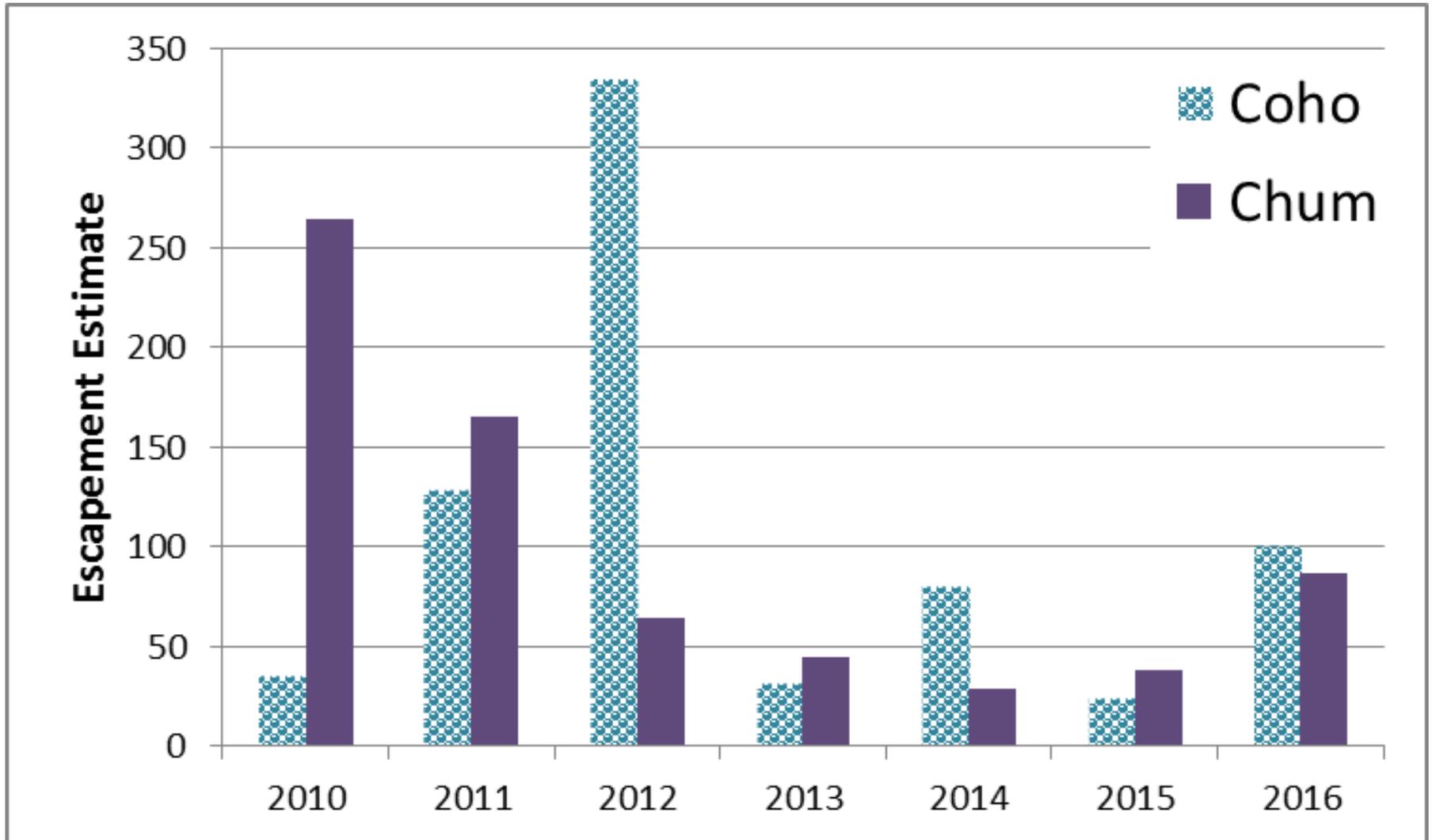
Species	Coho 	Chum 	Total
Miller Creek	75	71	
Walker Creek	26	15	
<b>Total</b>	<b>101</b>	<b>87</b>	<b>188</b>

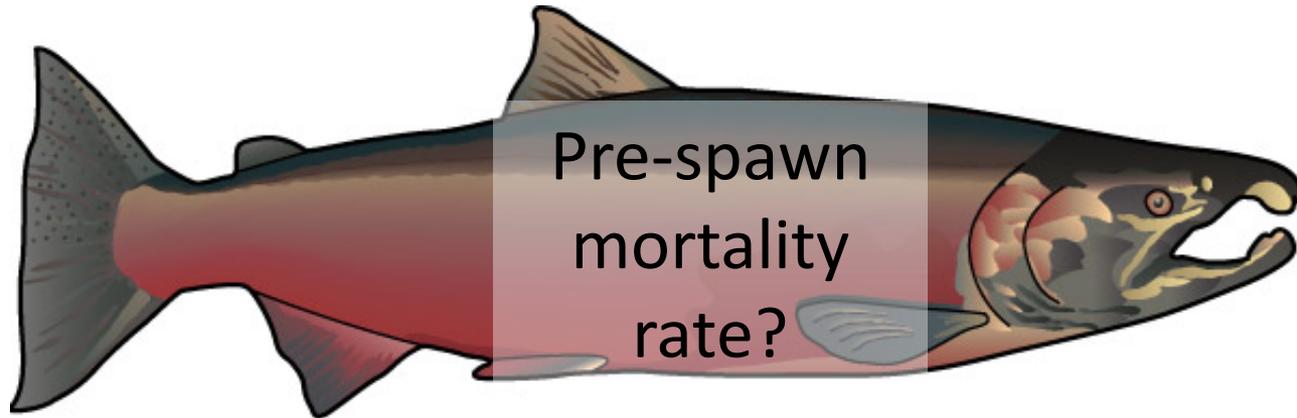
## Assumptions:

- Using the area under the curve (AUC) and assuming each fish was in the creek for 3 days corrects for probable double-counting of fish. Adding the number of carcasses may account for fish floating into the survey reaches from upstream.
- Salmon spend several days in the stream.

The estimated population is the “escapement estimate” – the actual number of fish that are likely to have escaped and survived to spawn.

# Spawning Population





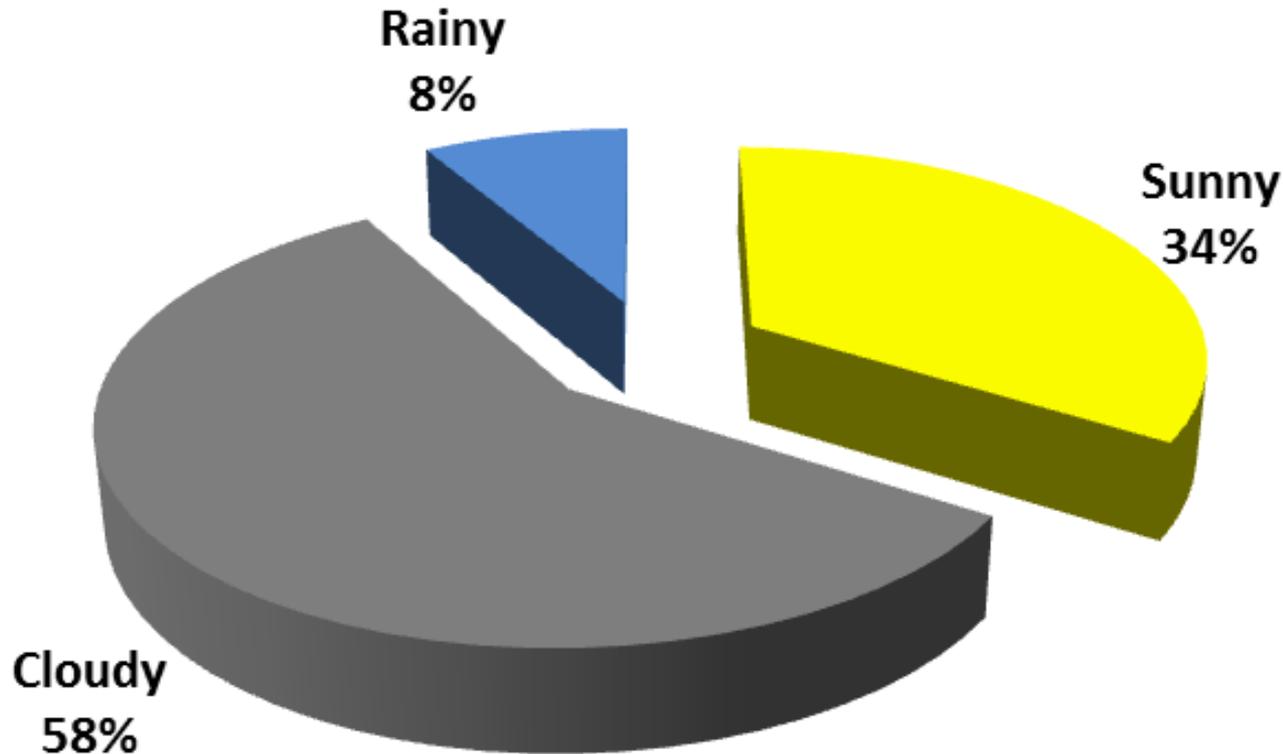
# What percent of coho died before spawning in Miller and Walker Creeks in 2016?

The “pre-spawn mortality” rate is the percent of returning adult female coho that died before spawning – as indicated by a dead fish that had a belly full of eggs and no sign of damage by a predator.

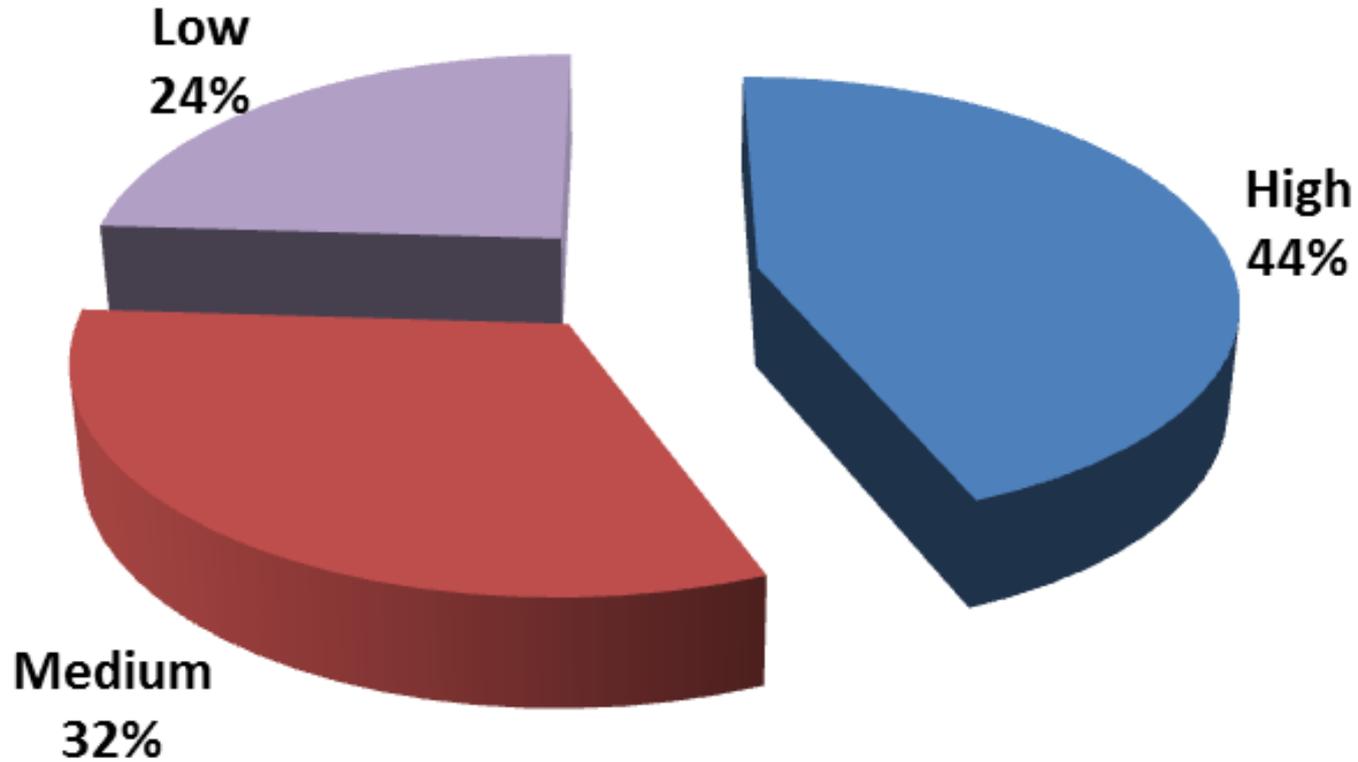
Whoever guesses closest will win something “fishy”!  
Complete the slip and place in the orange bucket.

# CSI Weather

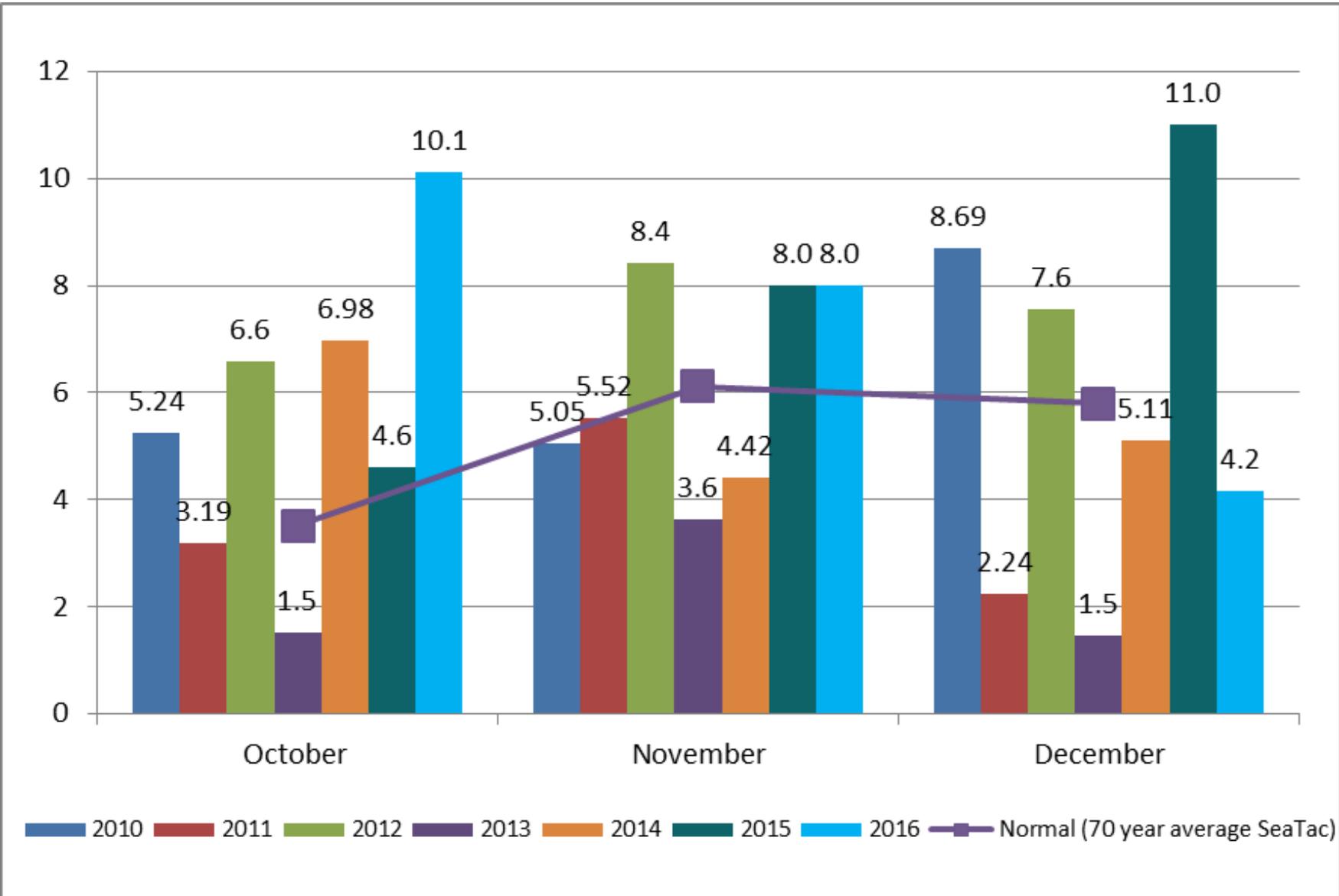
- Average survey time = 2 hours, 55 minutes
- Weather conditions (59 survey days):



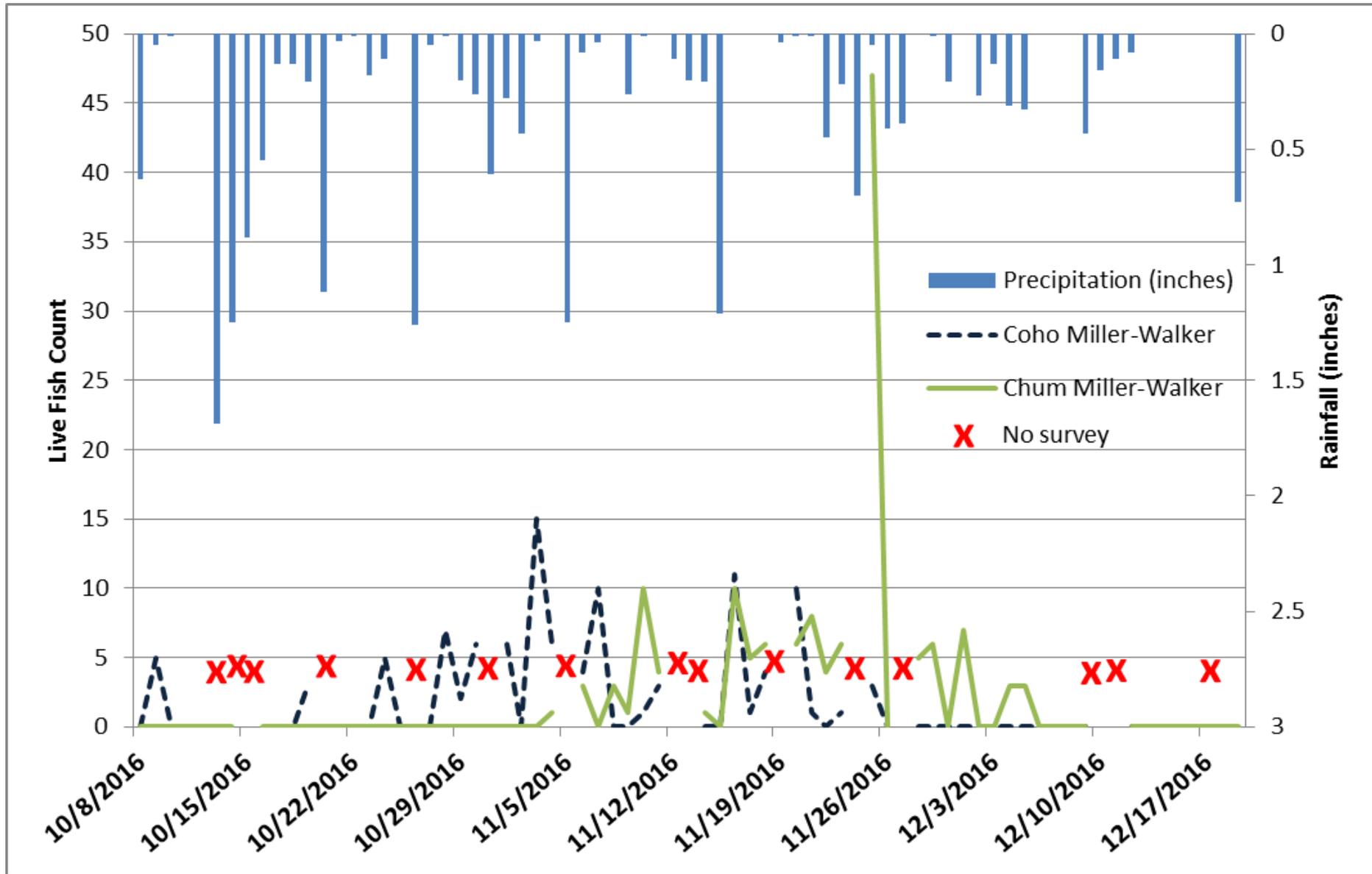
# Tide Level at Beach



# CSI Weather – Monthly Rainfall (inches)



# Rainfall and live fish - 2016

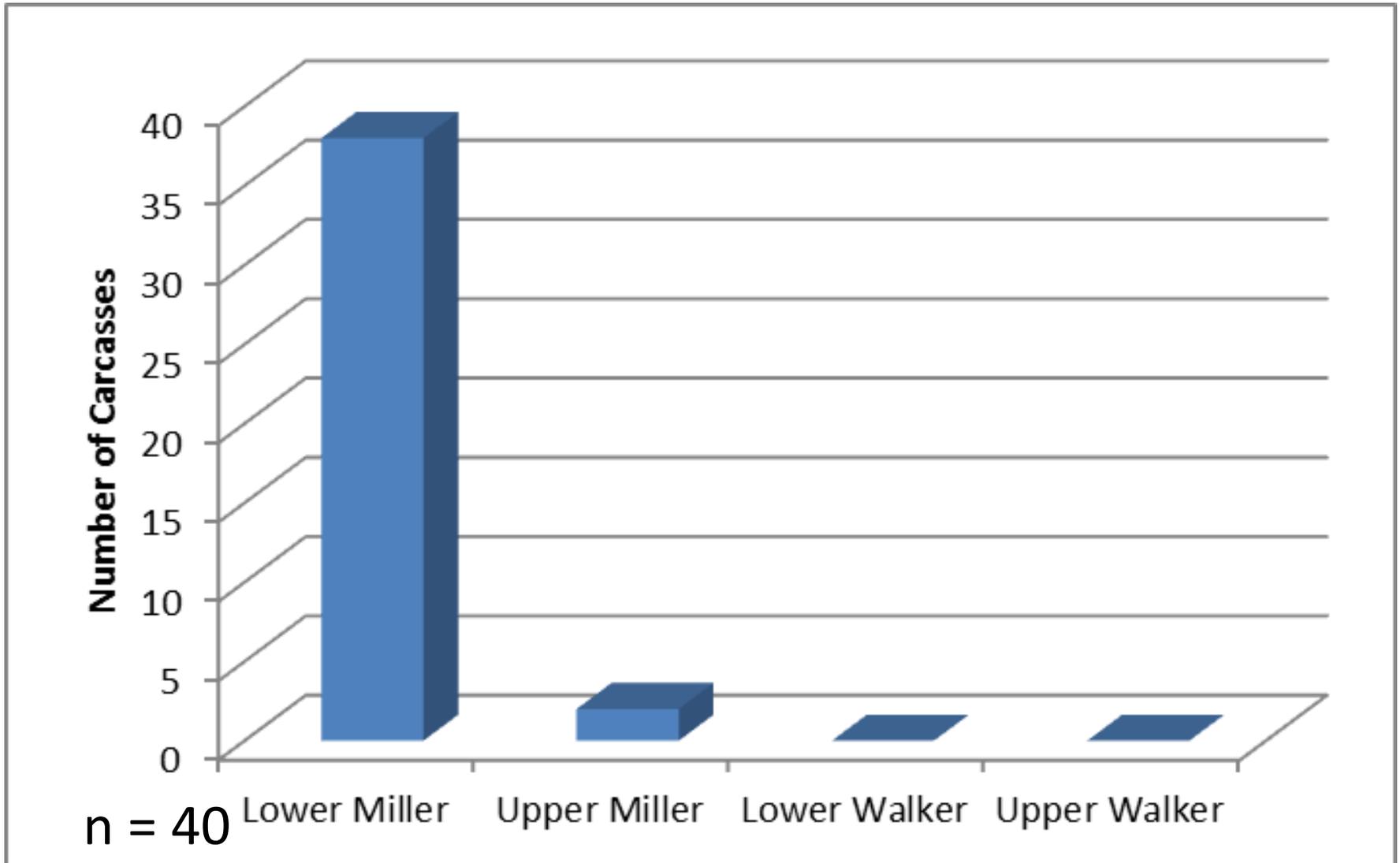


# Carcasses Summary

Species	Coho 	Chum 	Unidentified Adults
Miller Creek	54	43	10
Walker Creek	14	0	1
<b>Total</b>	<b>68</b>	<b>43</b>	<b>11</b>

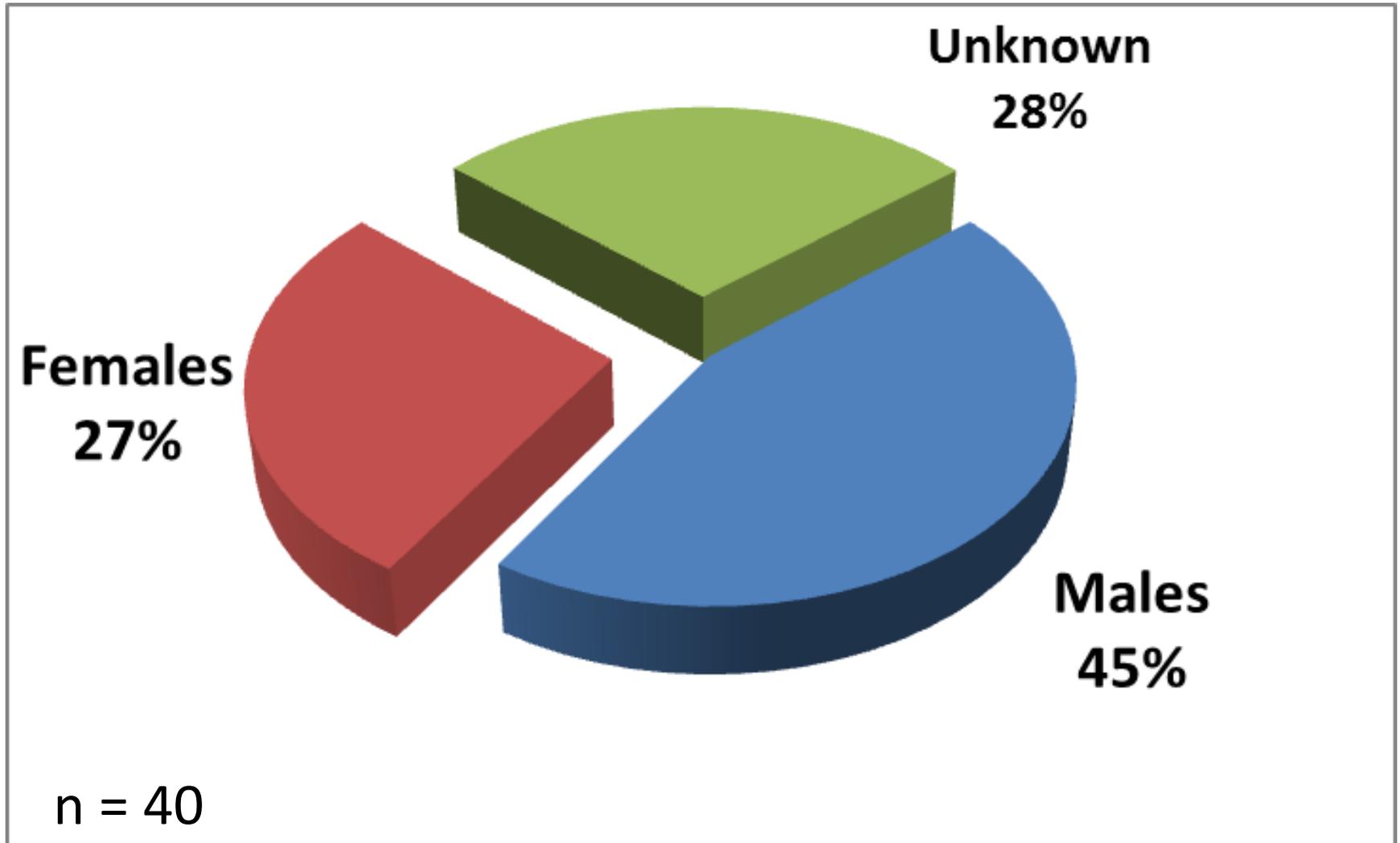


# Chum Carcasses: Location





# Chum Carcasses: Sex



# Predation by wildlife



**Predated chum carcass**

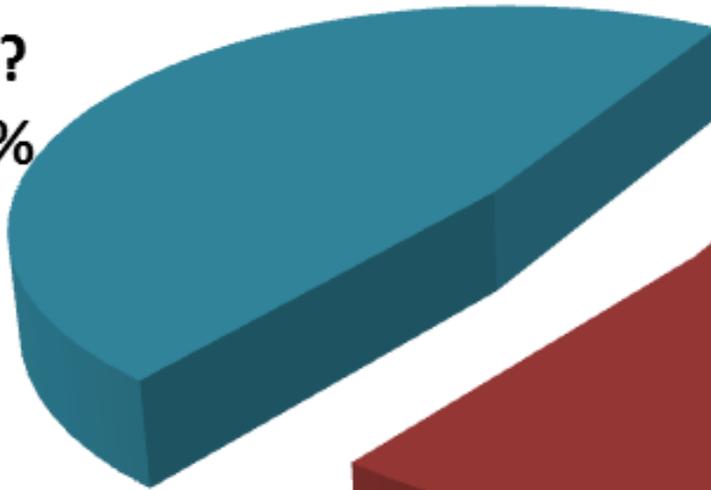
Photo by Gary Wagner

November 7, 2014

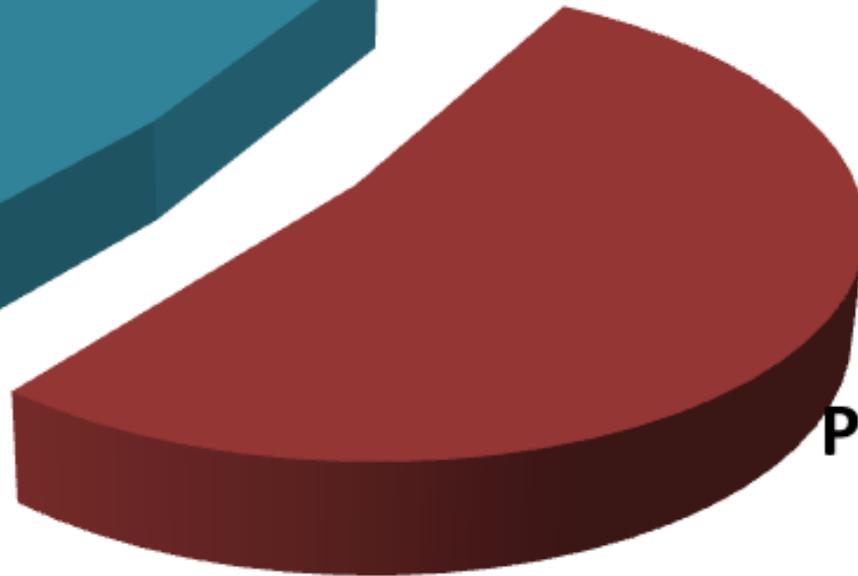


# Chum Carcasses: Predation

**Not  
Predated  
or ?  
48%**

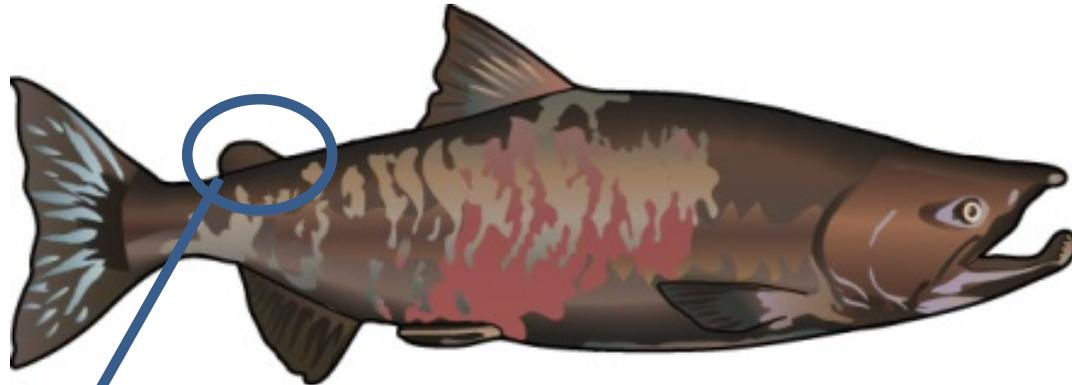


**Predated  
52%**



n = 40

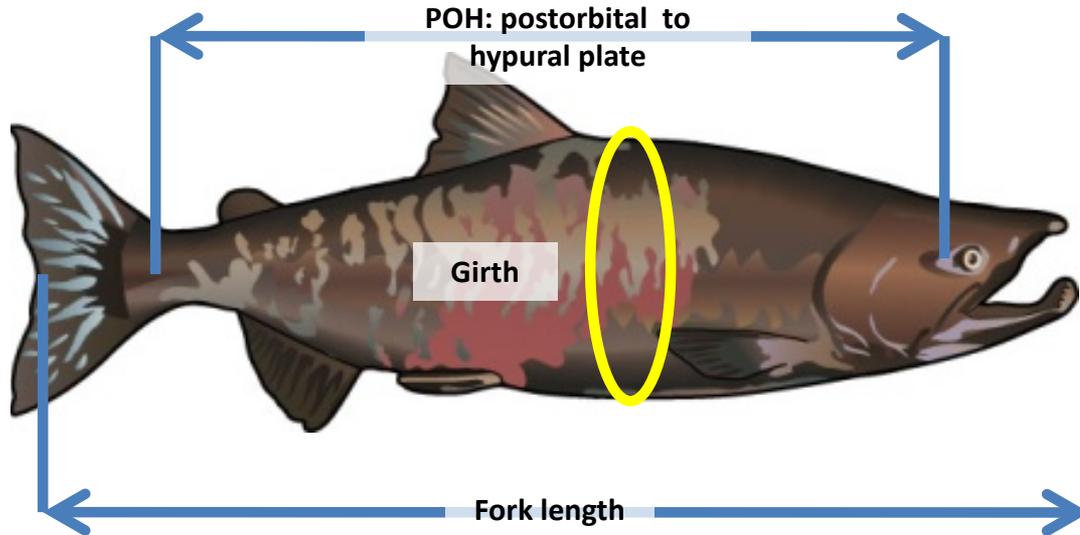
# Chum: Hatchery Origin Unknown



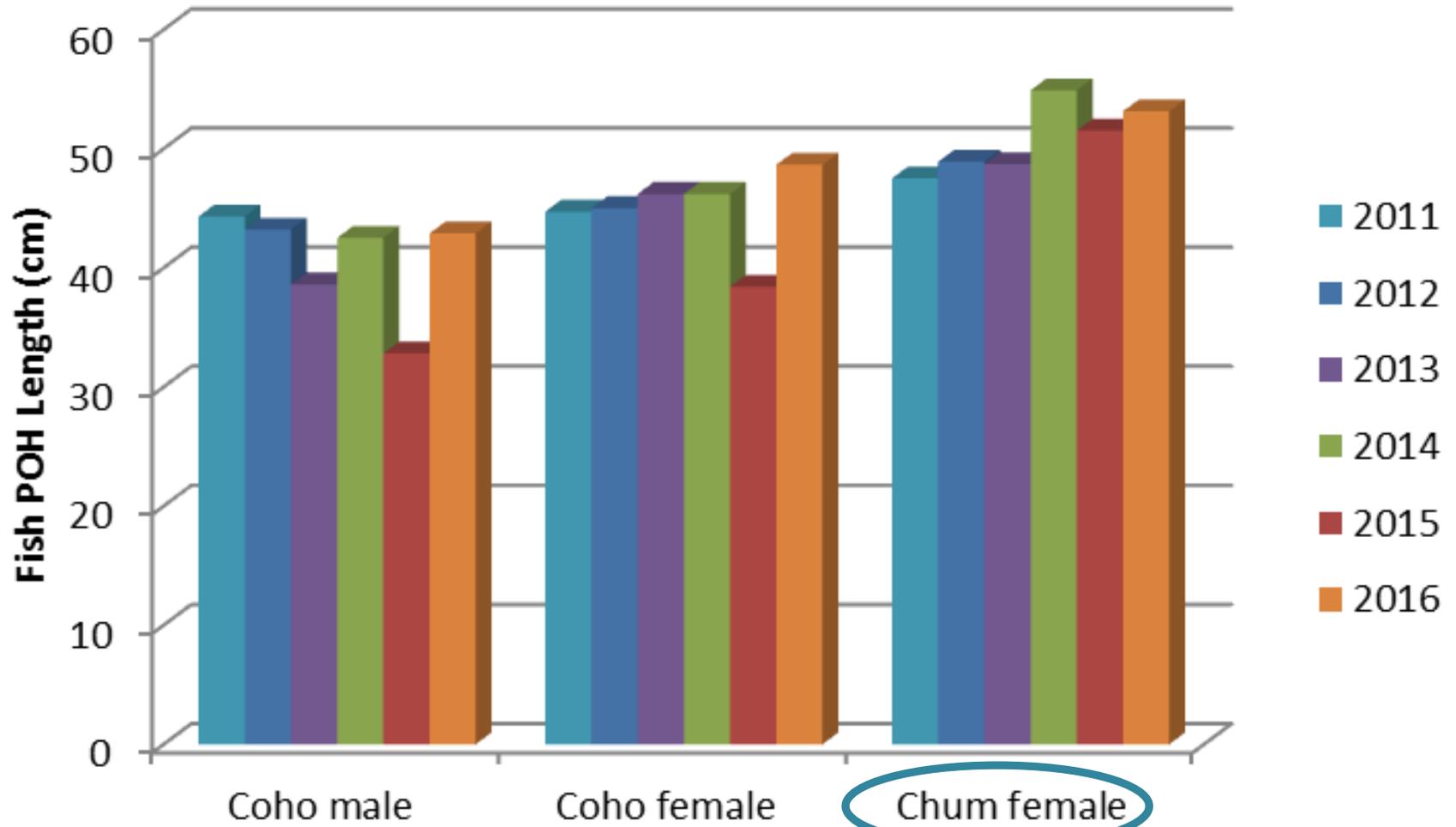
**Adipose fin**

# Chum Carcasses: Size

	Fork length (cm)	POH (cm)	Girth (cm)
Male average	67.6	52.5	33.1
Female average	66.7	53.1	29.3



# Fish Length



# Coho Prespawn Mortality Behavior

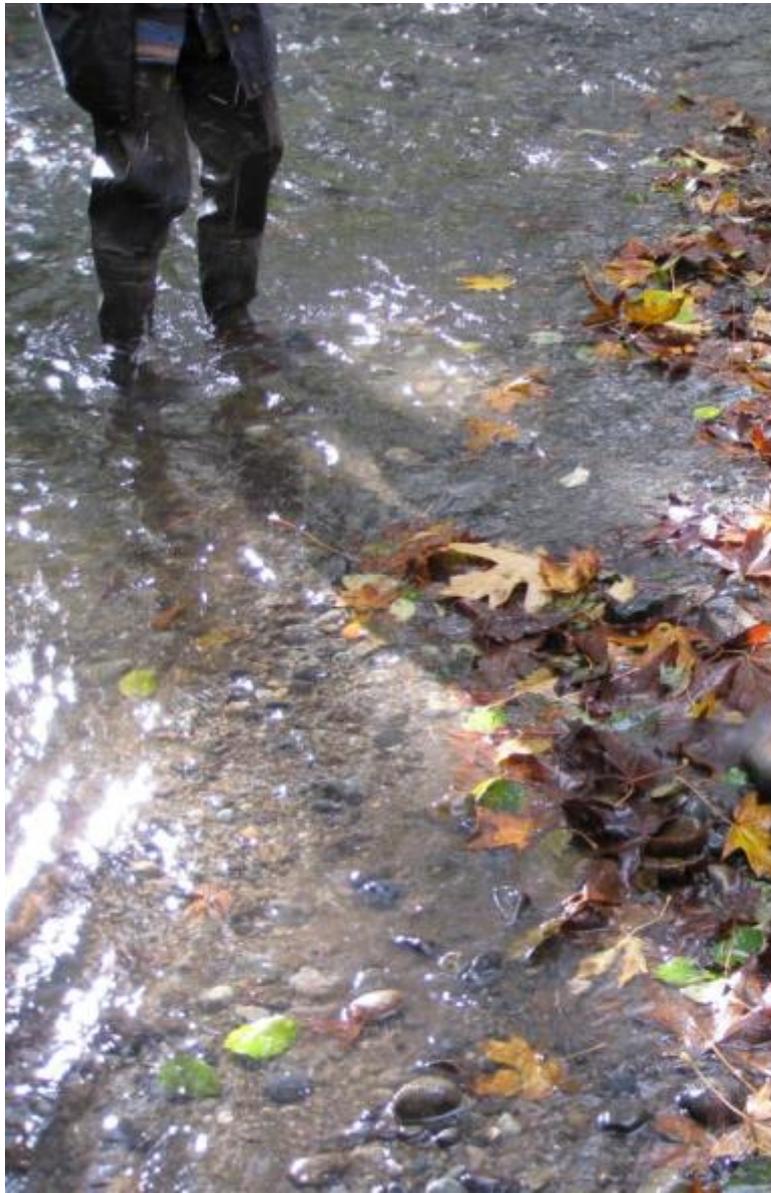


**Coho in distress - later  
died and collected by UW**

**October 18, 2016**

**Photo courtesy of Kristine Feldman**

# Coho Prespawn Mortality



**Coho experiencing  
“prespawn” mortality at  
Upper Miller survey location**

**October 23, 2009**

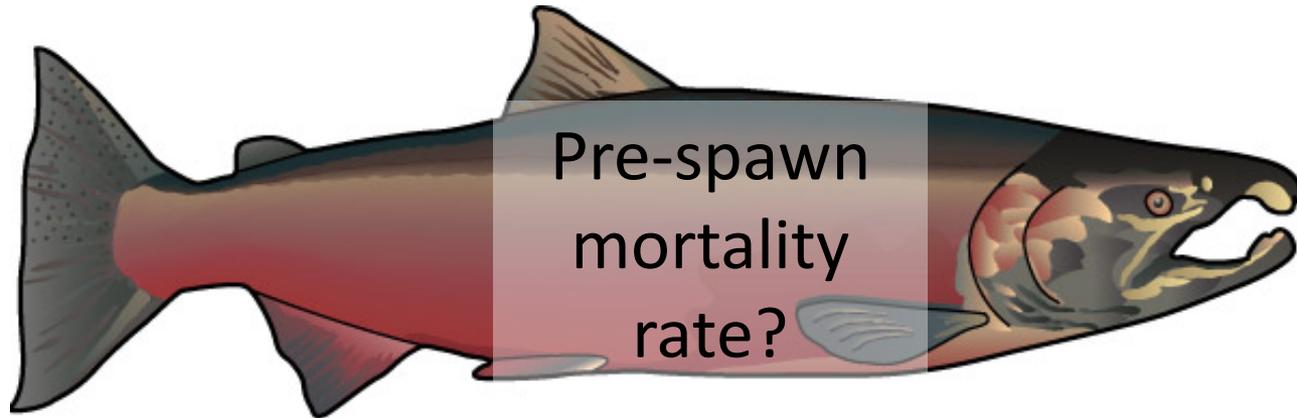
# Prespawn Mortality (PSM)



**Coho female, full of eggs**

October 25, 2012

Photo courtesy of Pam Silimperi



# What percent of coho died before spawning in Miller and Walker Creeks in 2016?

The answer is some percentage between 0 and 100%.

The “pre-spawn mortality” rate is the percent of returning adult female coho that died before spawning – as indicated by a dead fish that had a belly full of eggs and no sign of damage by a predator.

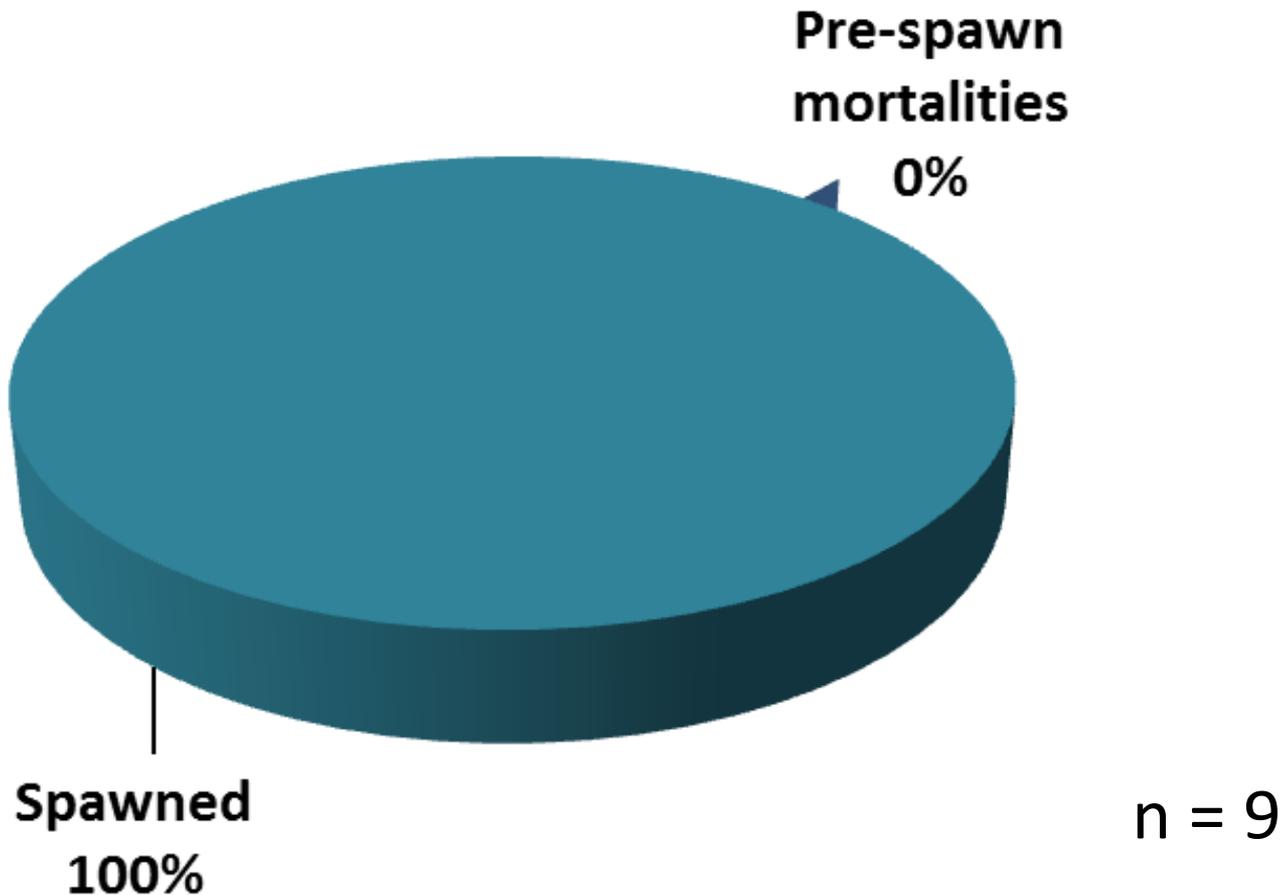
**Whoever guesses closest will win something “fishy”!  
Complete the slip and place in the orange bucket.**



# Chum: Success in Spawning

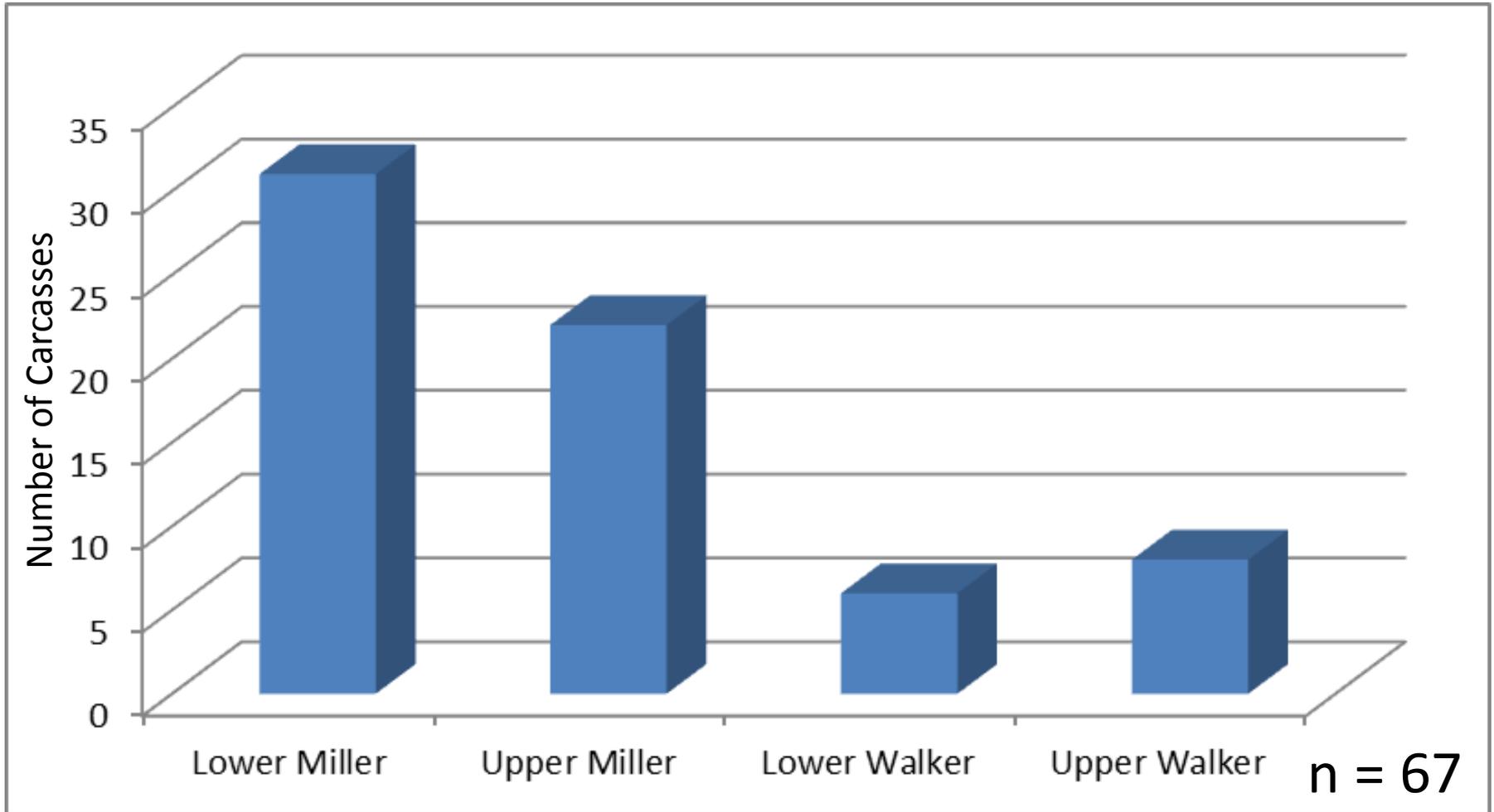
Miller and Walker Creeks – 0 of 9 females =

**0% Pre-spawn Mortality**



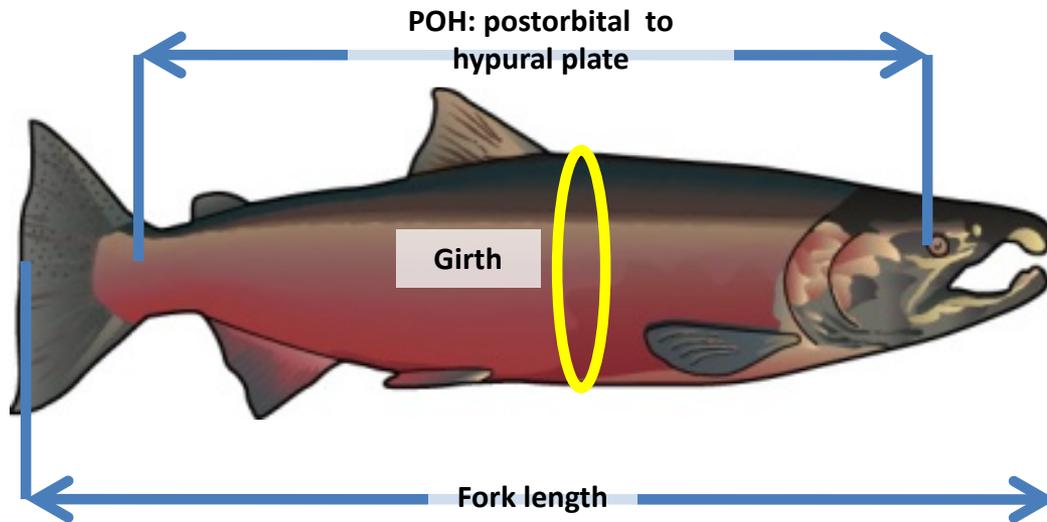


# Coho Carcasses: Location

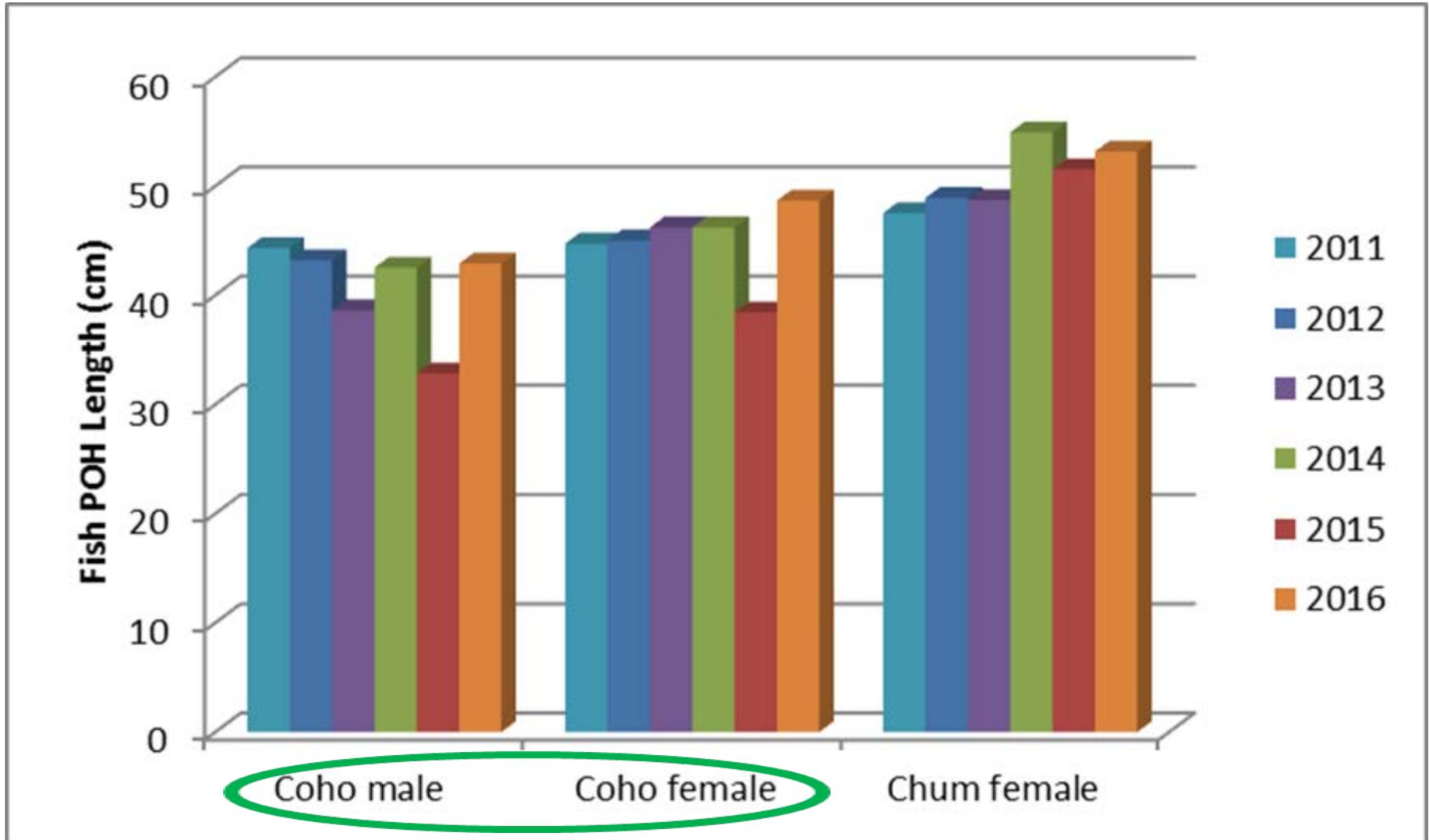


# Coho Carcasses: Size

	Fork length (cm)	POH (cm)	Girth (cm)
Male average	54.9	42.9	27.9
Female average	61.3	48.7	31.6

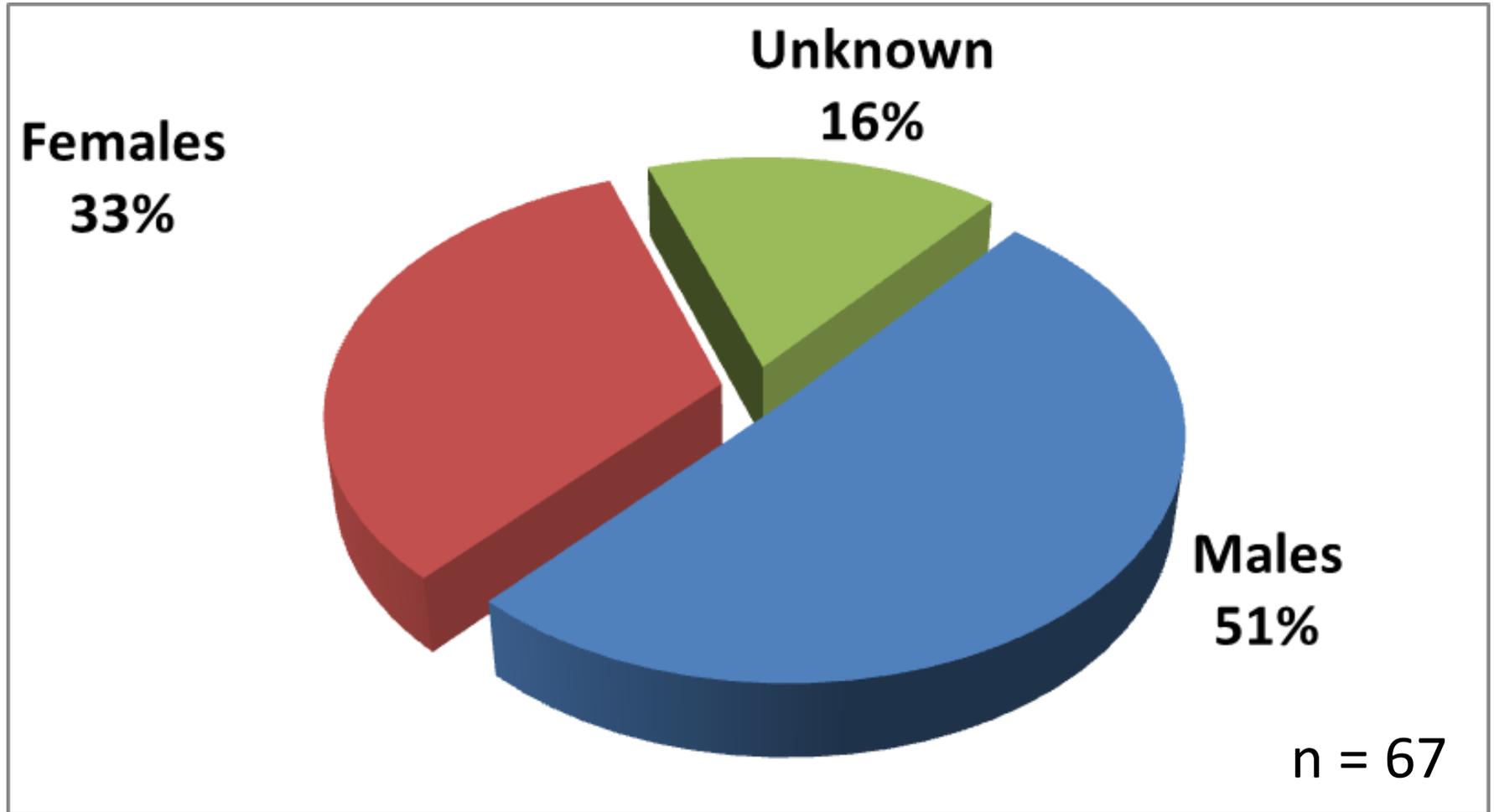


# Fish Length over 6 years





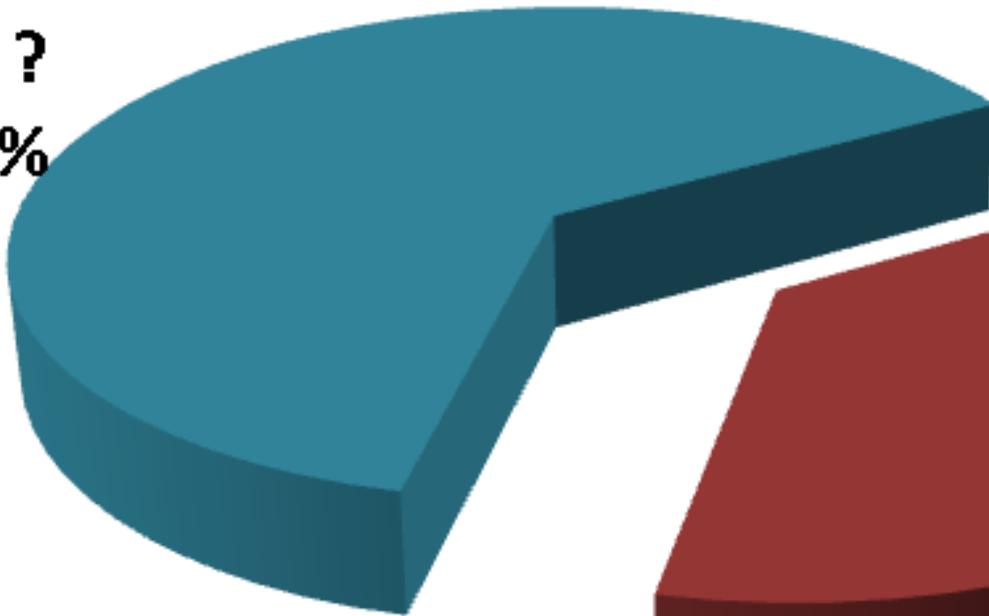
# Coho Carcasses: Sex





# Coho Carcasses: Predation

**Not  
Predated  
or ?  
63%**



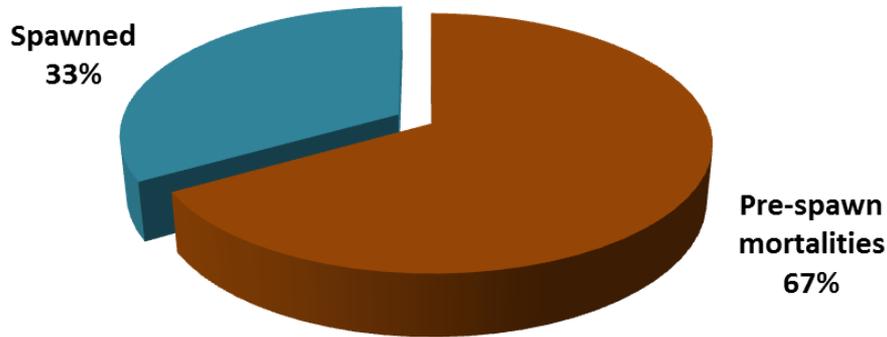
**Predated  
37%**

n = 67



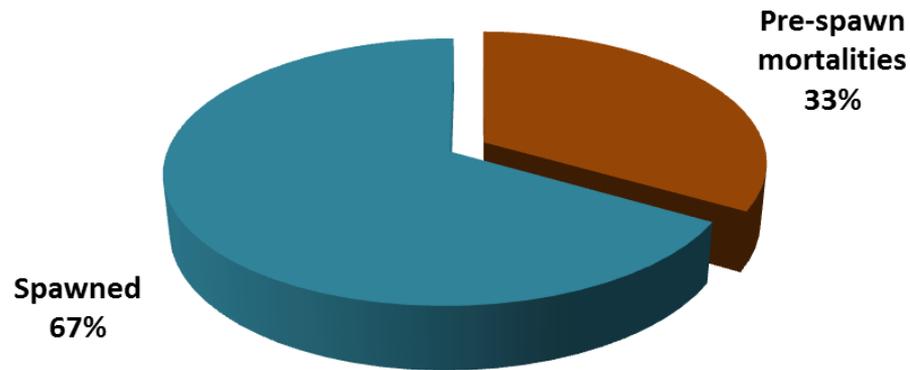
# Coho: Success in Spawning

**Miller Creek**  
**67% PSM**



12 females

**Walker Creek**  
**33% PSM**



3 females

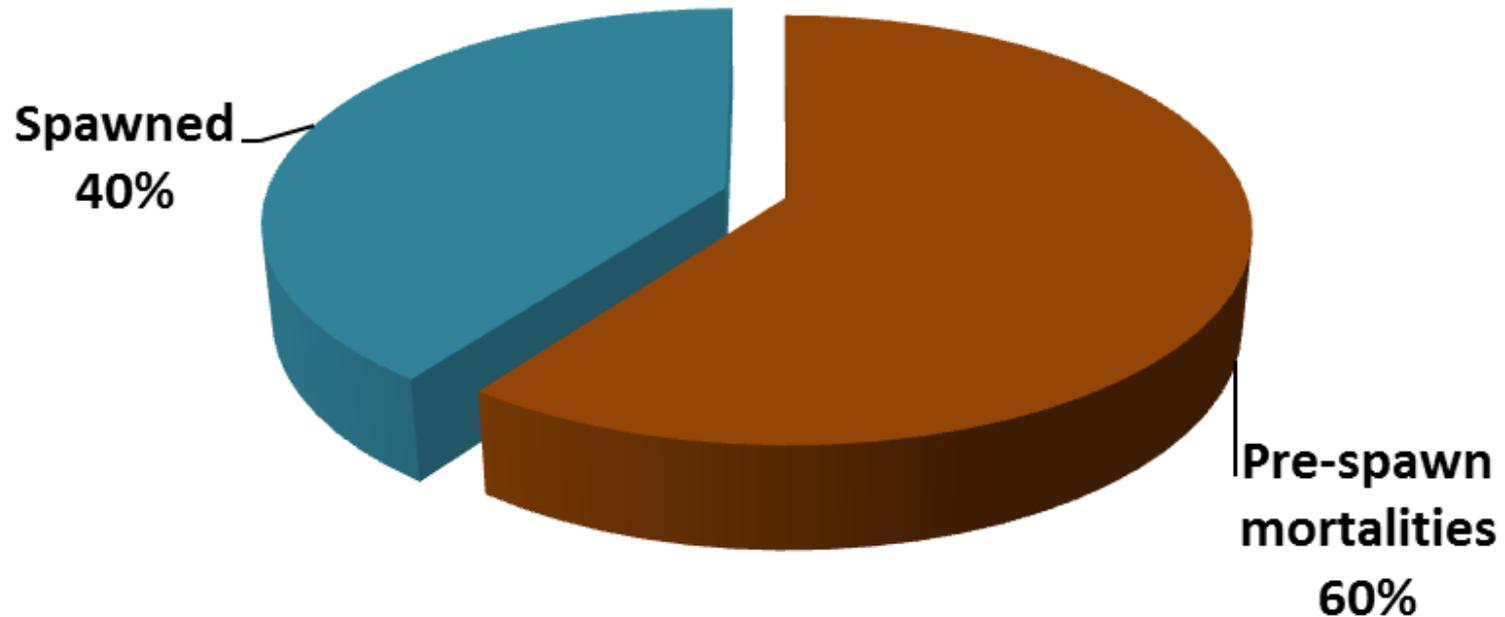
**Overall coho pre-spawn mortality:**



# Coho: Success in Spawning

Miller and Walker Creeks – 9/15 females =

**60% Pre-spawn Mortality**



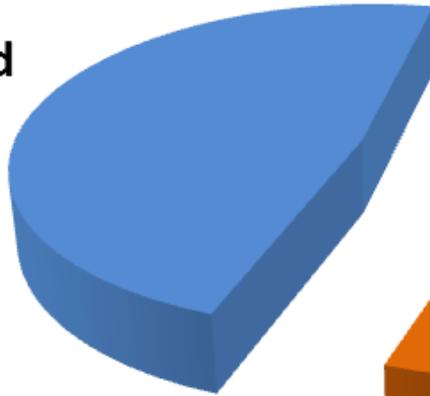
N = 15



# Coho: Hatchery Origin

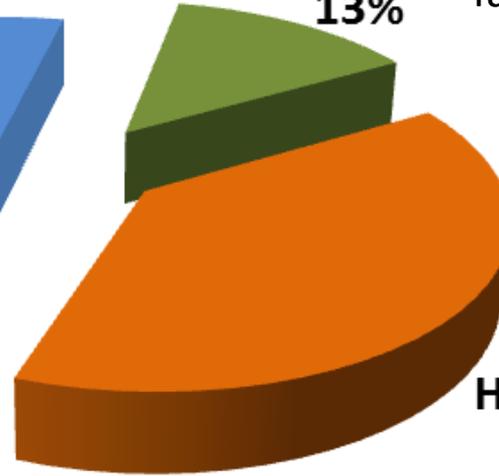
32 fish were unmarked -  
either "wild-origin" or  
TU outplanted fish

**Unmarked**  
**48%**



**?**  
**13%**

9 fish were too  
far gone to tell



26 fish originated from  
hatcheries outside of the  
basin and "strayed" into  
the streams to spawn

**Hatchery**  
**39%**

**Adipose fin**

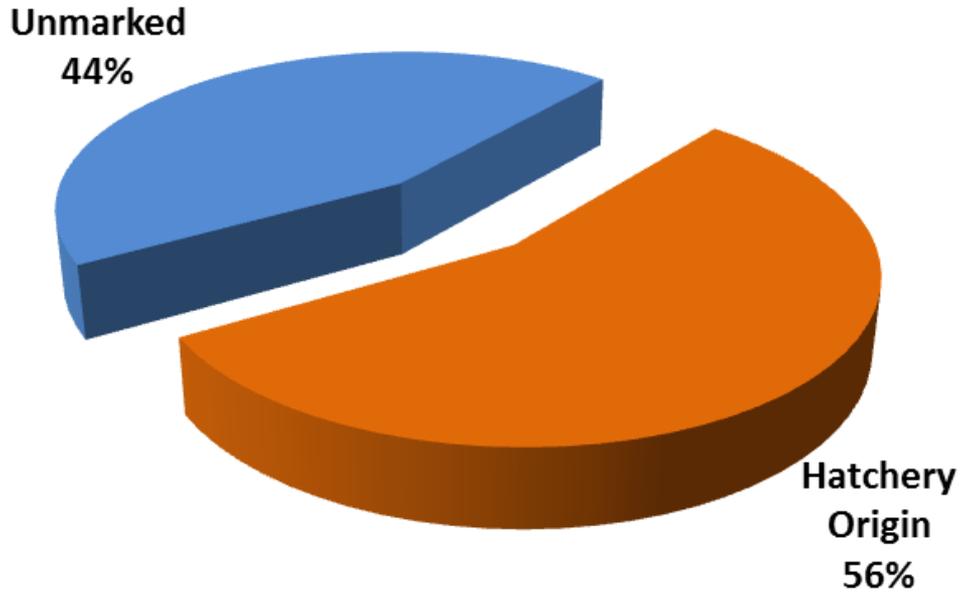


n = 67



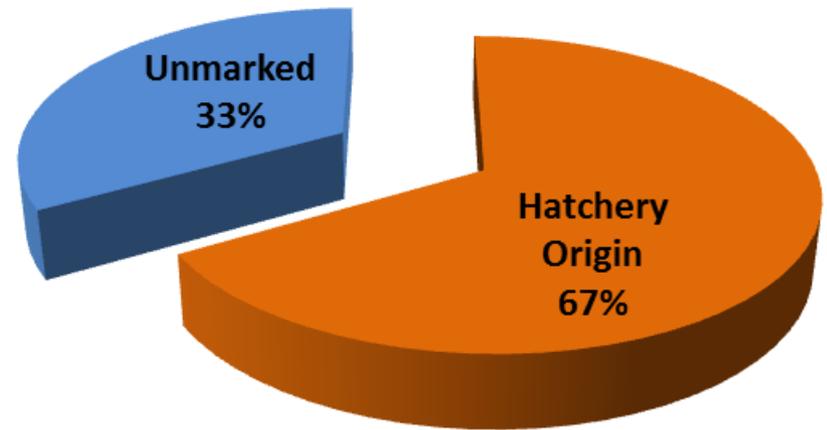
# Coho: Success in Spawning and Origin

Pre-spawn Mortalities



n = 9

Spawned Fish

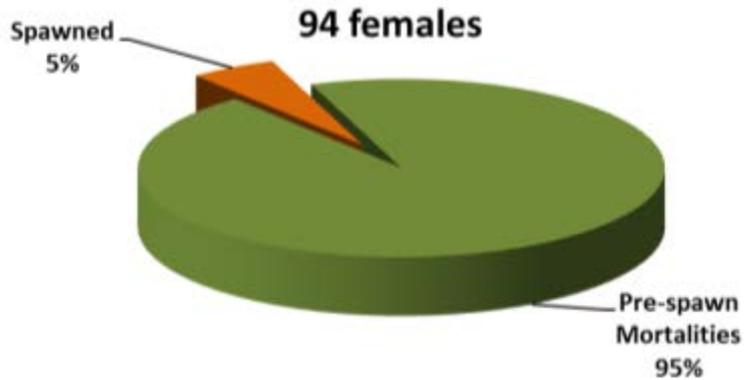


n = 6

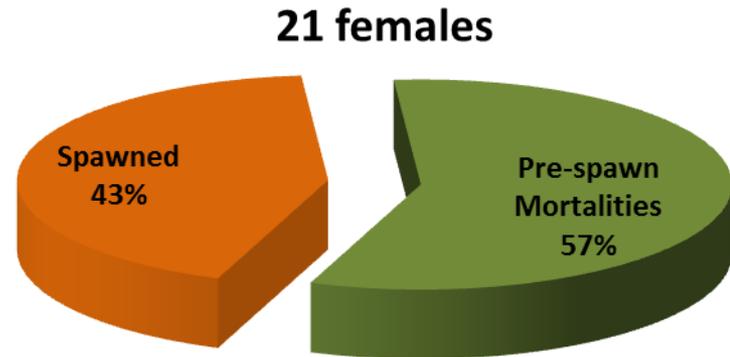


# Coho: Spawning Success in 2012: Miller/Walker and Nearby

## Miller Creek- 95% PSM

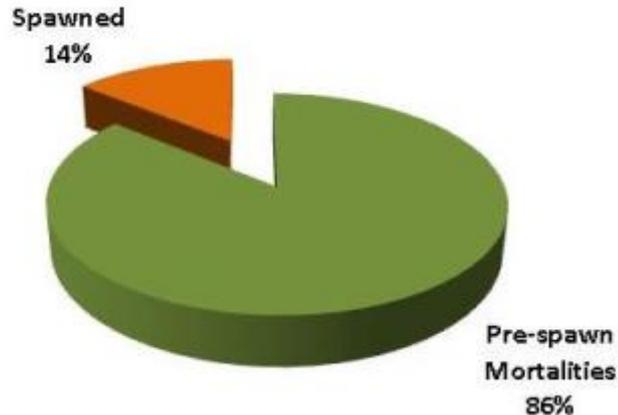


## Walker Creek – 57% PSM



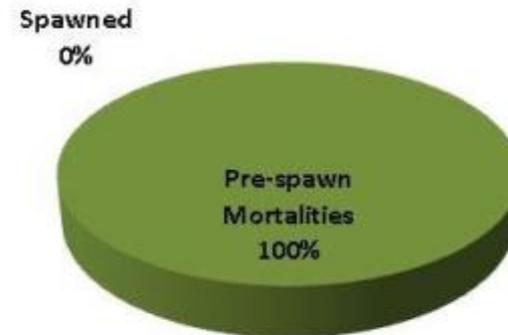
## Longfellow Creek – 86% PSM

86 females



## Des Moines – 100% PSM

34 females



# Wildlife

- River otter (upper Miller)
- Mallards
- American wigeon
- Eurasian wigeon
- Bufflehead
- Great blue heron
- American dipper
- American robin
- kinglet
- Red-winged blackbirds
- Spotted towhee
- Song sparrow
- Gulls
- Crows



**Ducks on Walker Creek pond**

Photo courtesy of Pam Silimperi

# Predation



Photo courtesy of Erik McDonald, 2016



Photos courtesy of Pam Silimperi, 2016

# Thank You Volunteers!



# Citizen Science Power

- 34 volunteer surveyors
- 141 volunteer days
- 165.5 hours of surveys
- Average survey: 2 hours, 54 minutes
- Most days surveyed:
  - Ed Nugent (12 days)
  - Tied for 2<sup>nd</sup> Place: Lee Moyer, Joy Neubauer, and Roger Neubauer (9 days)
  - Pam Silimperi (8 days)



**Photo courtesy of  
Pamela Silimperi, 2015**

# 4) Plans for 2017 CSI

**Team Tuesday – Pam  
and Kay**

Photo courtesy of  
Pamela Silimperi, 2016



# Plans for 2017 CSI Survey Season

- Continue the excellent work of the last 7 years by surveying again at four locations in Normandy Park
- Maintain between 25 & 35 volunteers
- Training in early October, 2017
  
- **Sign in with your email address to stay informed**
- **Tell your friends and family!**

# 5) Stream and Salmon Health



**St. Francis  
Elementary students  
mark storm drains by**

**Lake Burien**

October 5, 2010

Photo courtesy of  
Michael Stein-Ross

**Coho salmon fry in Miller  
Creek in Normandy Park**

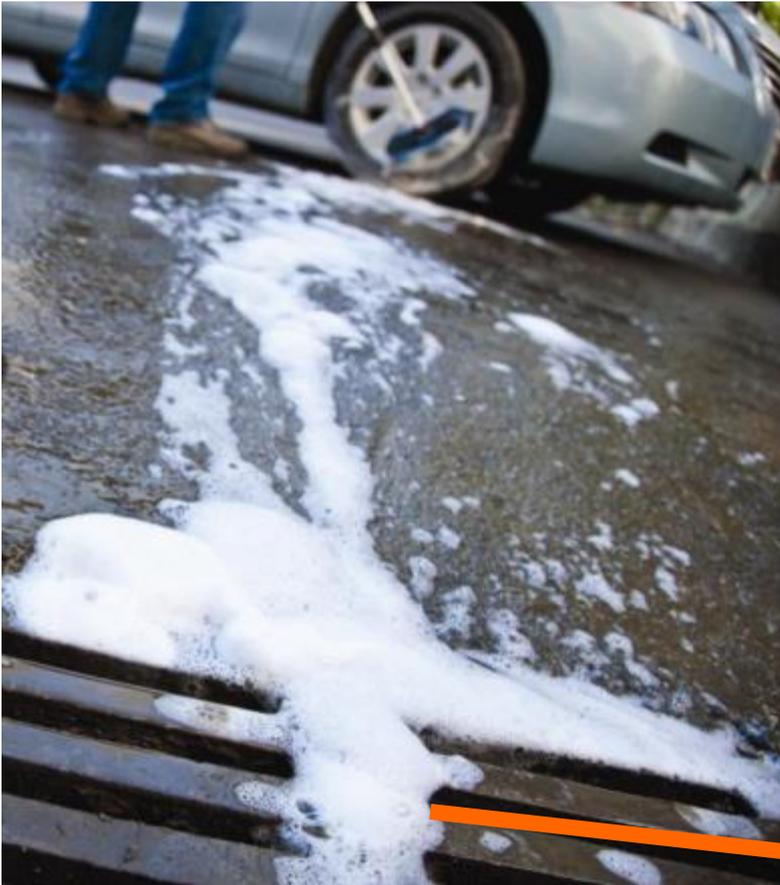
June 30, 2008



# How Urban Lands Affect Streams

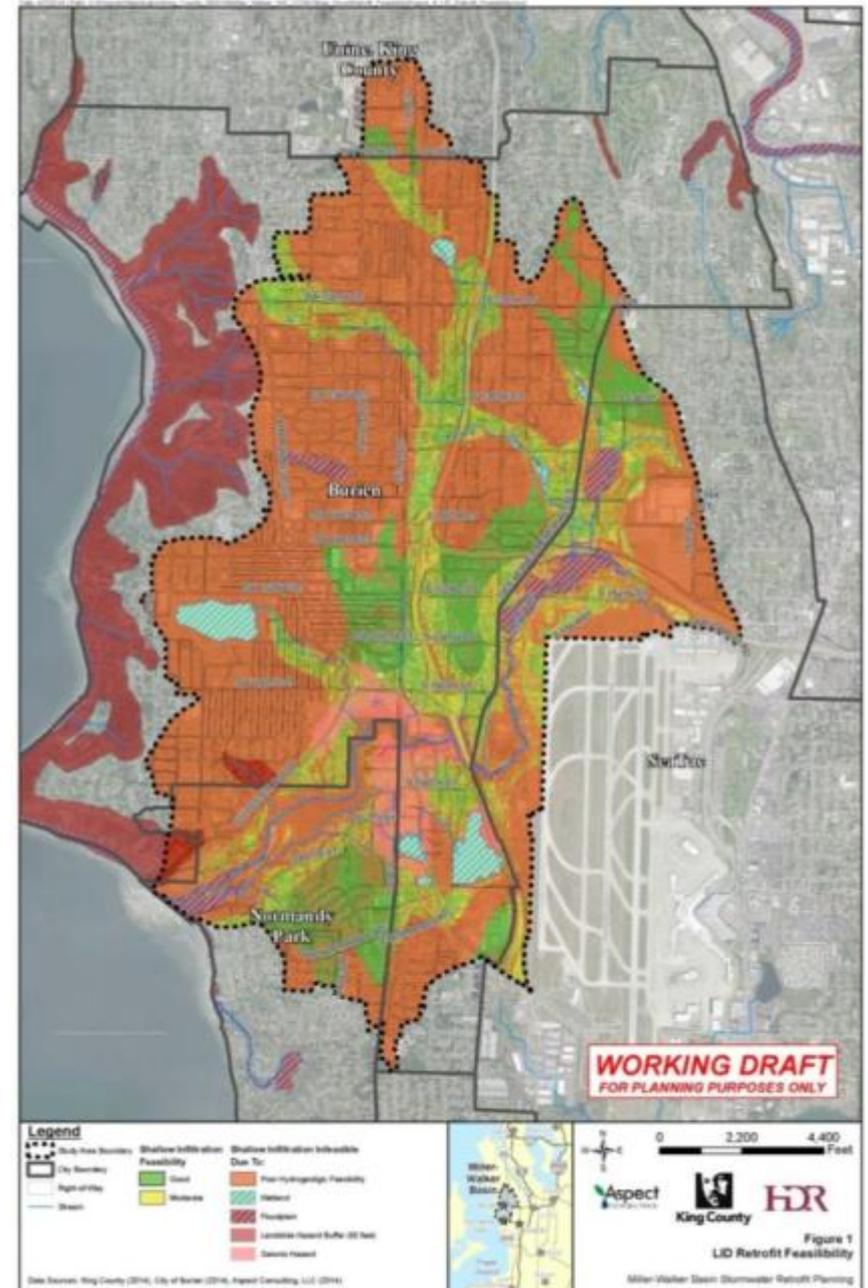
- Stream flow
  - Faster, higher flowing water more often
  - Less and warmer water in summer
- Water pollution
  - Warmer, low dissolved oxygen, altered pH, more turbid
  - More pollution - bacteria, metals, pesticides, oil, salt, etc.
- Physical habitat conditions
  - Substrate: hardened, more silt/sand, less gravel
  - Salmon nests in gravel are smothered
  - Streamside vegetation: native, invasive, absent
  - Reaches inaccessible to resident and anadromous fish

# Stormwater is not treated



# Miller-Walker Stormwater Retrofit Analysis

- Goal: identify where stormwater management will make the biggest difference and be successful
- Grant funded by Dept. of Ecology and supported by Miller-Walker basin partners
- Hydrologic and soil, geology, steep slope analysis of Miller-Walker basin for good locations
- 80 public sites identified and evaluated



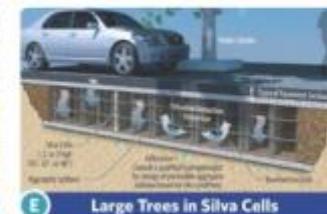
# Top 4 Projects:

- Concept design reports
- Won over \$1million in grants
  - Moshier Park and adjacent Moshier Community Art Center - Burien
  - 6<sup>th</sup> Ave SW from SW 146<sup>th</sup> St to SW 153<sup>rd</sup> St - Burien
  - King County District Court – 6<sup>th</sup> Ave & SW 149<sup>th</sup> St. – King County/Burien partnership

Proposed Concept



Typical BMP Concepts



# 6) Our Role



# The Truth about English Ivy

## English ivy is a bully.

In the plant world, English ivy is:

### Aggressive

English ivy grows very quickly, about 6 feet a year. Vines on this invasive climber can grow over 90 feet long. A greedy competitor for soil, sunlight, and water, English ivy will smother every understory plant in its path.

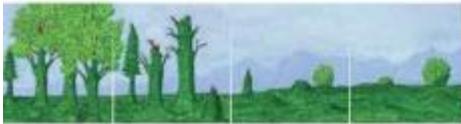


### Pushy

Spreading quickly by seed, English ivy heeds no boundaries. Birds, such as the American Robin, snack on its seedy berries. The birds then distribute the seeds in their droppings wherever they fly, often miles away. In this way, ivy on one property can spread to other yards and forests and to our public parks and green spaces.

### Ruthless

English ivy can kill large trees by suffocating trunks and weighing down branches. By covering trees, ivy's dense growth creates a "sail effect" that topples trees in wind storms. Ivy can take over entire forests. Blanketing the landscape, out-of-control ivy creates an "ivy desert"—a monoculture where no other plant can survive.



Unless we remove English ivy it will destroy our forests.

## English ivy is unruly.

In the human world, English ivy is:

### Destructive

English ivy can topple large trees, weaken fences and masonry walls, and cause structural collapse with the bulk of its woody vines. Do not underestimate ivy: vines on mature plants can weigh up to 2,100 pounds with trunk-like stems nearly one foot thick!

### Unhealthy

King County's pest problem is aided and abetted by English ivy. Rats and other vermin hide in the cover of English ivy and use its vines to climb onto roofs and into our homes.



### Expensive

Cities in the Puget Sound area spent over \$11 million removing English ivy from our parks from 2005-2011 and have only made a small dent in the thousands of acres that are infested. Volunteers have spent over 400,000 hours pulling English ivy and re-planting our public forests. Homeowners can face expensive repairs to their fences and houses and for hazard tree removal, as well as the cost of ivy removal itself. English ivy has already cost us a lot.



## SAVE A TREE — CREATE A SURVIVAL RING



If you find a tree "drowning" in ivy, do not attempt to yank the ivy out of the tree's branches—you might damage the tree. Instead, cut the vines at shoulder height and again at the base of the tree. Pull the vines away from the lower tree trunk. (Don't worry about the vines higher up on the tree: once cut they will wither and die.) Then, pull up the vines and remove all ivy roots from around the tree trunk in a 6-foot radius, taking care not to damage the tree roots. Keep this circle ivy-free to create a survival ring for the tree.

Take action against English ivy



1. **Rip it out.** Everyone should take a stand against ivy and use other ground covers. There are many attractive alternatives to ivy. For plant suggestions, visit [www.ivyout.org/ivyalt.htm](http://www.ivyout.org/ivyalt.htm).

If you can't eliminate all ivy, remove all berry-producing branches, and keep it heavily pruned and away from trees. Please, don't let those ivy clippings escape. Always dispose of ivy properly in your green waste receptacle.

2. **Join a community event.** We need to rescue thousands of acres of forested land from ivy. Join an ivy-removal event at a park near you. Parks departments and local organizations are working in many places throughout the county and can use your help. Contact your local parks department or visit the volunteer information page at [www.kingcounty.gov/weeds](http://www.kingcounty.gov/weeds).
3. **Support ivy-free nurseries.** Despite its noxious weed status, English ivy is not on the state quarantine list and is still sold at many garden stores. However, some businesses have chosen to go ivy-free. Ask your favorite garden store if they carry ivy and make sure to thank them if they don't.



## Things *You* Can Do



Save your trees –  
remove the ivy



Trees ARE the view

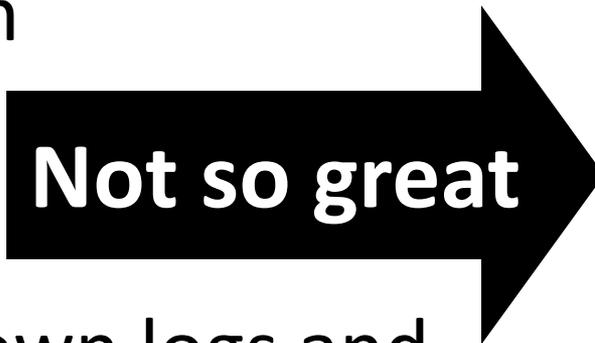




# Things *You Can Do*



Leave down logs in the stream



Leave down logs and branches for wildlife



# Things *You* Can Do: Volunteer



**Upcoming volunteer events:  
Walker Preserve on April 1  
and May 27, 2017**

**Photos taken Feb. 18, 2012 & Feb. 6, 2016**



# Things *You* Can Do: Become a Habitat Steward

- We provide:
  - Training
  - Tools and gloves for volunteers
  - Assistance with planning
  - All plants, mulch
  - Event advertising

**Upcoming volunteer events:  
144<sup>th</sup> St. Trail & Miller Creek on  
March 11 and April 29, 2017**



# KCD's Landowner Incentive Program



Photo courtesy of Pamela Silimperi, 2015

# Things *You* Can Do: Volunteer

Volunteer for the  
Community  
Salmon  
Investigation  
for 2017!

**Volunteer Tracey with a  
predated chum**

Fall 2015

Photo courtesy of Pamela Silimperi



# Shared Funding for Stewardship

Thank you Miller-Walker basin partners, who support King County basin stewardship:



**King County**



Photo courtesy of Barb and Darrell Williams

# The End

**Miller-Walker Basin**  
Local partners  
working together  
for clean water  
and healthy  
streams



# Stewards of the Cove at work since 2003



**Normandy Park  
Community Club**

Puget Sound   
Starts Here

# Things You Can Do

Clean up runoff:

Attend workshops to learn  
to fix oil leaks in your car

- Check for leaks
- Contain leaks until you can get the car fixed



[www.fixcarleaks.org](http://www.fixcarleaks.org)

## Things You Can Do

Clean up runoff:



- Wash your car **at a carwash** (avoids wasting up to 80 gallons!) - or -
- **On the lawn** rather than in the street (keeps soap and oil out of the storm sewer and out of the creek)

# Things You Can Do

Clean up runoff: pick up after your pet





# Things *You* Can Do

Volunteer to mark storm drains



**Lindsay/Andolina family  
marked storm drains in  
their Burien neighborhood**

**August 25, 2010**

# Coho with Coded Wire Tags: 0

Coho released here in May 2012

- Coho from Elliot Bay – Muckleshoot Indian Tribes Net Pen
- From Keta Creek Hatchery (Green River) in 2010
- Released in 2012 into Puget Sound
- 3 females: 2 spawned, 1 PSM
- Miller Creek

