Community Salmon Investigation for Highline "Season Finale"

Presented by Elissa Ostergaard
Miller and Walker Creeks Basin Steward
March 1, 2012

Community Salmon Investigation for Highline 2011 Results

1. Purpose of *Community Salmon Investigation: Highline*
2. How *CSI: Highline* works
   - Stream surveys
   - Necropsies
   - Survey locations
3. Results of October – December 2011 surveys
   - Summary data
   - Analysis
   - Weather and Wildlife

Volunteer Recognition

4. Plans for 2012
5. Factors affecting stream and salmon health
6. Your role!

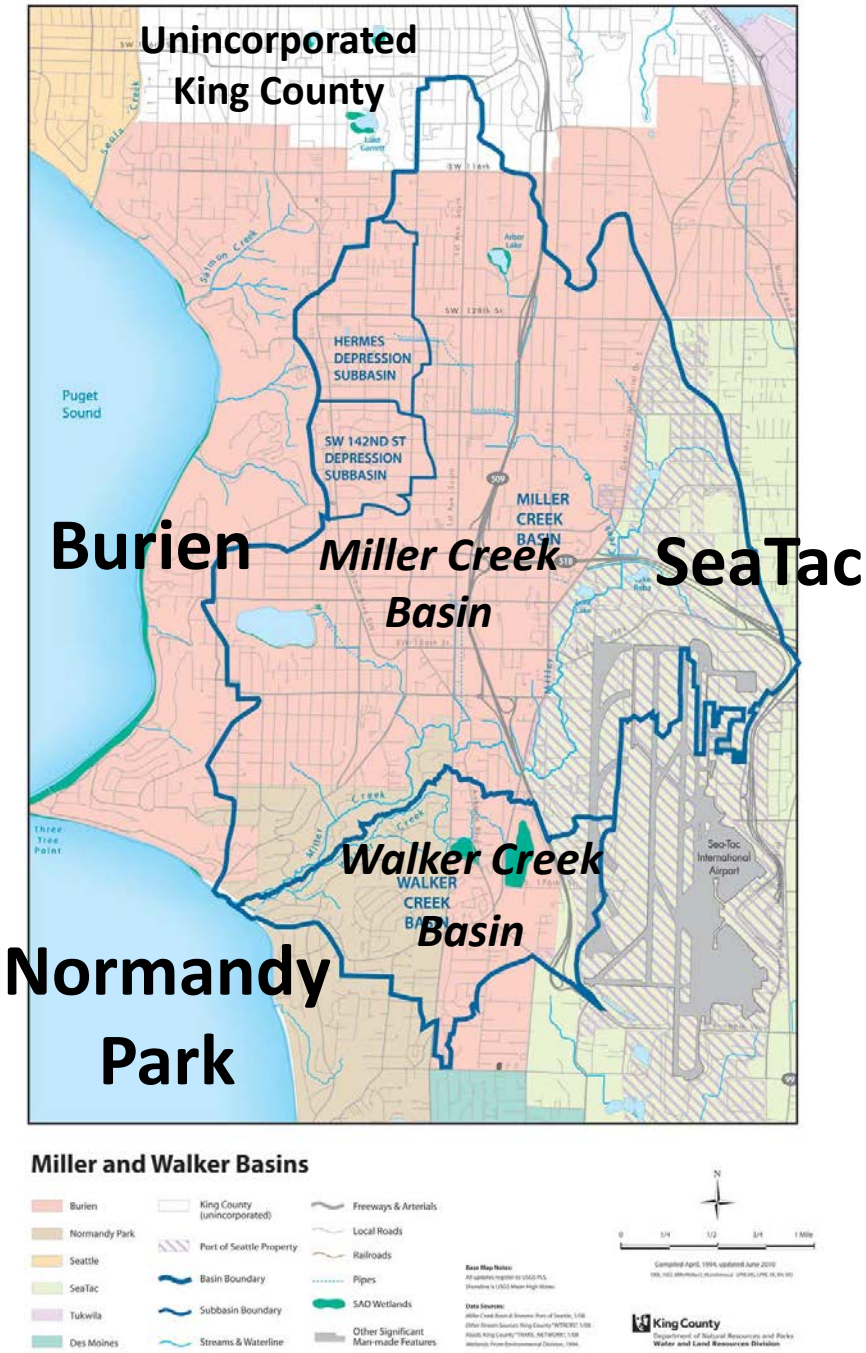
1) Purpose of CSI

Coho "jack" (immature male)

November 11, 2011

Photo courtesy of David Bobanick

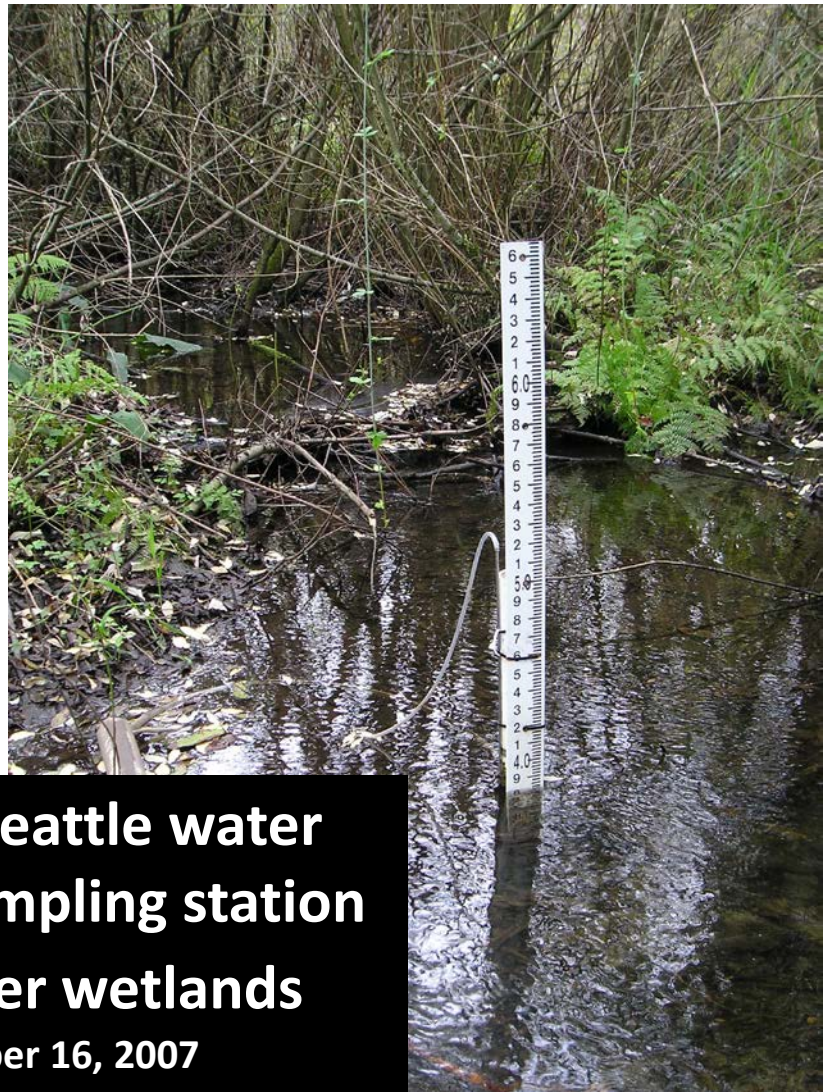
Basin Boundaries for Miller and Walker Creeks



Draft 2006 Basin Plan Recommendation on Monitoring

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

- 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 at ERAC in Burien
December 4, 2008

Watersheds, rivers and streams

Central Puget Sound

Central Puget Sound Watershed
Vashon - Maury Island
Miller and Walker Creeks Stewardship Page
Stewardship Tips
Volunteer Calendar
Stream Blog - 2010
Miller Creek Photo Tour
Walker Creek Photo Tour
Basin Plan
Monitoring Information
Salmon Monitoring Program 2010 - "CSI: Highline"
Contacts
Hydrologic Modeling
Nearshore Environments
Puget Sound Shoreline Stewardship Guidebook
Related organizations
News archive
Site Map

Monitoring Information: How Are Miller and Walker Creeks Doing?

This page provides information on:

- Final Monitoring Coordination Recommendations
- Background Information on Monitoring Coordination Workshops in 2008
- Current and Past Monitoring

Learn about the Community Salmon Investigation (CSI) of adult salmon returns in fall 2010.

Final Monitoring Coordination Recommendations

Three workshops occurred in fall 2008 where interested citizens and staff discussed coordination of monitoring of water flow, water quality, and habitat conditions on Miller and Walker Creeks. Basin Steward Dennis Clark drafted recommendations based on input from these workshops. These recommendations were posted for public review in June 2009 before being finalized. The final versions include:

- Recommendations including Table 2 and Appendices A and B (Adobe Acrobat)
- Table 1: Miller and Walker Creeks Recommended Monitoring Locations for

Activities and Purpose of *CSI: Highline*

Tasks	Why?	Use of Data
Count adult salmon	As "keystone species," salmon are indicators of the health of fresh and marine waters and surrounding lands	Baseline data that will allow us to determine status and trends when monitored over time (>10 years)
Identify whether coho are spawning before they die	"Pre-spawn mortality" is known to occur in Miller/Walker but extent has not been quantified	Baseline data that may allow us to determine effects of pollution prevention efforts in future
Raise the profile of the streams and their resources in the Highline community	Improving the health of these streams and Puget Sound requires residents to be aware of and act to protect the shared resources of the streams	To be determined – by all of us!

Scientific Plan for Adult Monitoring

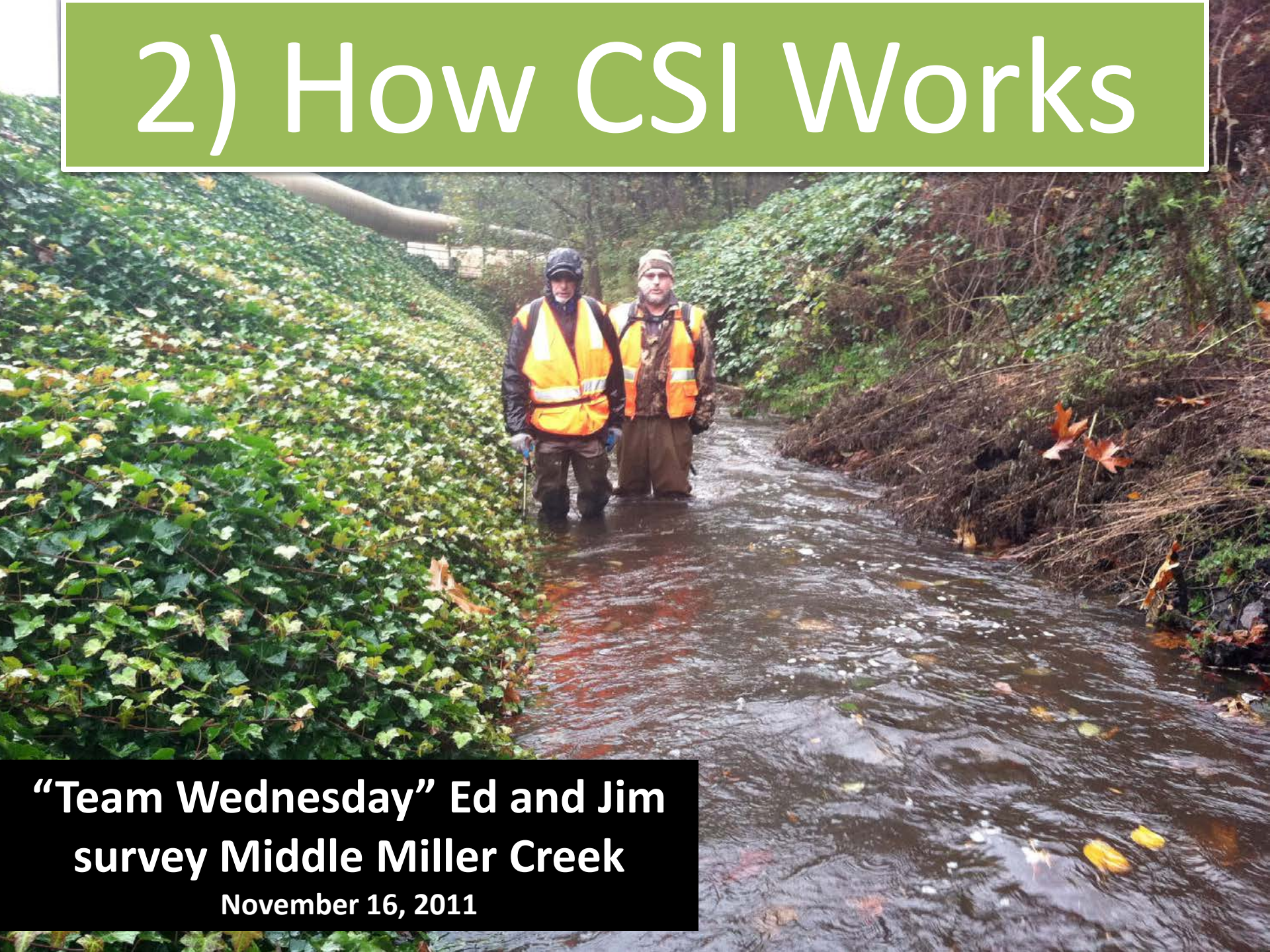
Survey Plan for Adult Fish Counting and Coho Prespawn Mortality in Miller and Walker Creeks

Community Salmon Investigation for Highline 2011

Version September 30, 2011

NOAA, Wild Fish Conservancy, the City of Seattle, King County and others have conducted a number of assessments concerning coho salmon in Seattle area creeks (Collier et al. 2003, Scholz et al. 2004, and McCarthy et al. 2008). Findings of these efforts indicate that while salmon were successfully returning to many urban streams, a high proportion of sexually mature female coho carcasses showed large numbers of retained eggs. Investigators documented highly erratic swimming behavior and prespawn mortality among both male and female coho. Affected fish from different urban streams displayed a common suite of symptoms, including surface swimming and gaping, fin splaying, spasming, disorientation, and loss of equilibrium. The coho usually died within a few minutes to a few hours after becoming overtly symptomatic. Visual inspections generally indicated that the affected coho spawners were in good condition, with the silver coloration typical of salmonids that have recently transitioned to freshwater from the ocean (McCarthy et al. 2008). This phenomenon has been termed coho prespawn mortality (PSM).

2) How CSI Works



"Team Wednesday" Ed and Jim survey Middle Miller Creek

November 16, 2011

CSI "Cast"

- 24 volunteers from Burien, Normandy Park, and Seattle
- Seven daily teams – one team for each day of the week
- Backups to fill in

"Team Tuesday" Pam and Brenda

Photos courtesy of Pam Silimperi

CSI Training

Steve Damm from U.S. Fish & Wildlife Service teaches necropsies

October 7, 2010

CSI in Action

“Team Tuesday” Don and Brenda walk up Miller Creek

October 18, 2011

CSI in Action

Male and female coho on Upper Miller Creek

October 14, 2011

Photo Courtesy of Ed Nugent

CSI in Action

Lee measuring the carcass

November 17, 2011

CSI in Action

Evaluating egg retention

October 24, 2011

Photo by D. Bobanick

Property Owner Permission Graciously Provided by:

- Clint Adams
- Ann and Stephen Backstrom
- Linda and Thomas Beffa
- Brett Fish
- Glen and Karen Gabrielson
- John Hansen
- Chris Longridge
- Normandy Park Community Club
- Normandy Park Swim Club
- Southwest Suburban Sewer District

Survey Locations

- Five locations
  - Three on Miller Creek
    - Lower Miller – Longridge, The Cove, and Adams property
    - Middle Miller – Sewer District and Fish property
    - Upper Miller – Cantrell property
  - Two on Walker Creek
    - Upper Walker – Beffa, Backstrom, Gabrielson, Hansen properties
    - Lower Walker – The Cove, Swim Club

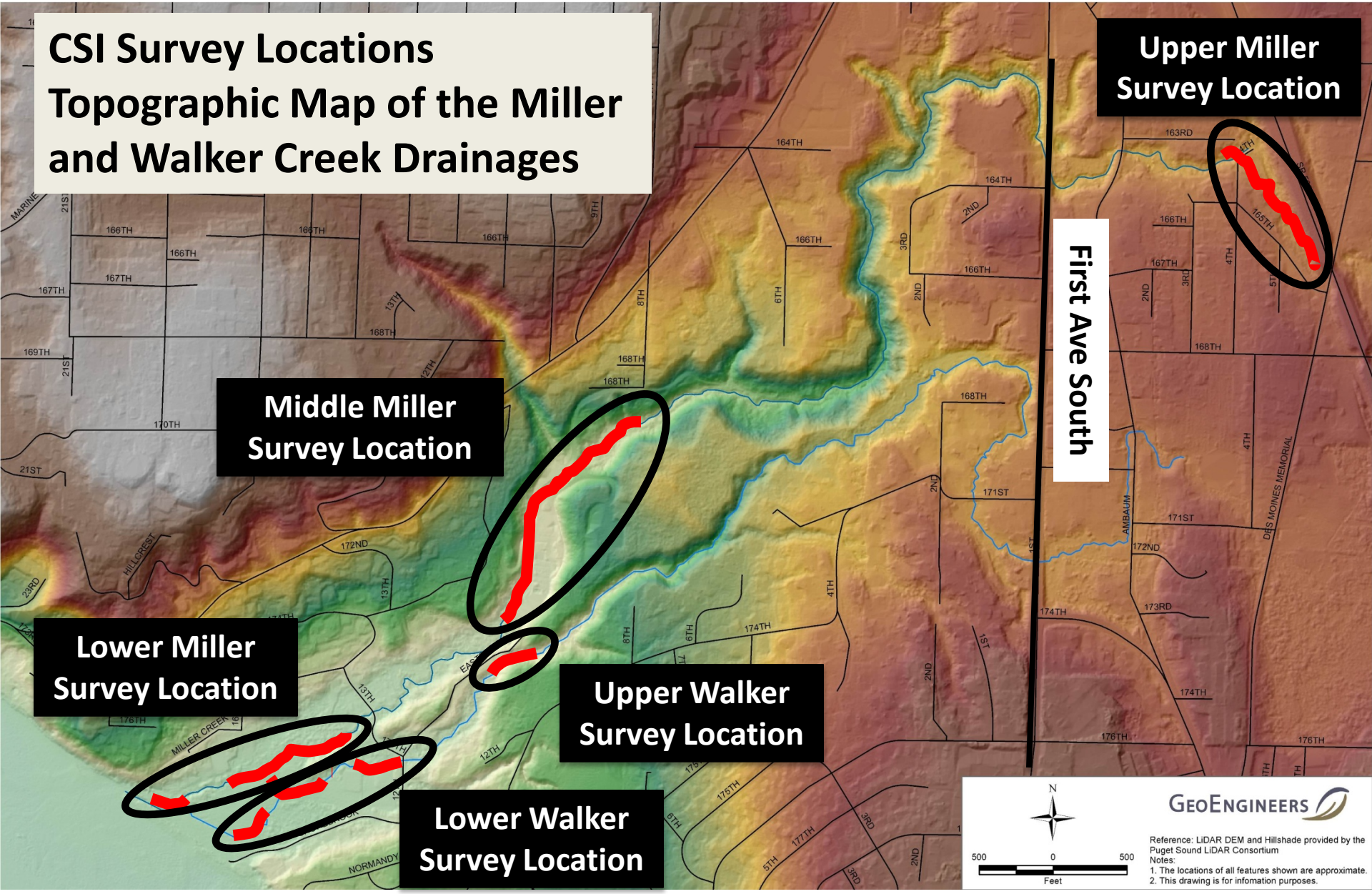


Image courtesy of GeoEngineers and Washington State Department of Transportation

3) 2011 CSI Results

Coho carcass

November 16, 2011

Coho: Life History

• October-Nov 2008	Spawned
• Early 2009	Hatched
• Early 2009 – early 2010	Rearing in stream
• Early 2010	Migration to salt water
• Early 2010 – October 2011	Rearing in Puget Sound and Pacific Ocean
• October – November 2011	Migration upstream, spawning, death

Chum: Life History

- Nov. – December 2007 — Spawned
- Early 2008 — Hatched and migrated to salt water
- Early 2008 – Nov. 2011 — Rearing in Puget Sound and Pacific Ocean
- Nov. – December 2011 — Migration upstream, spawning, death

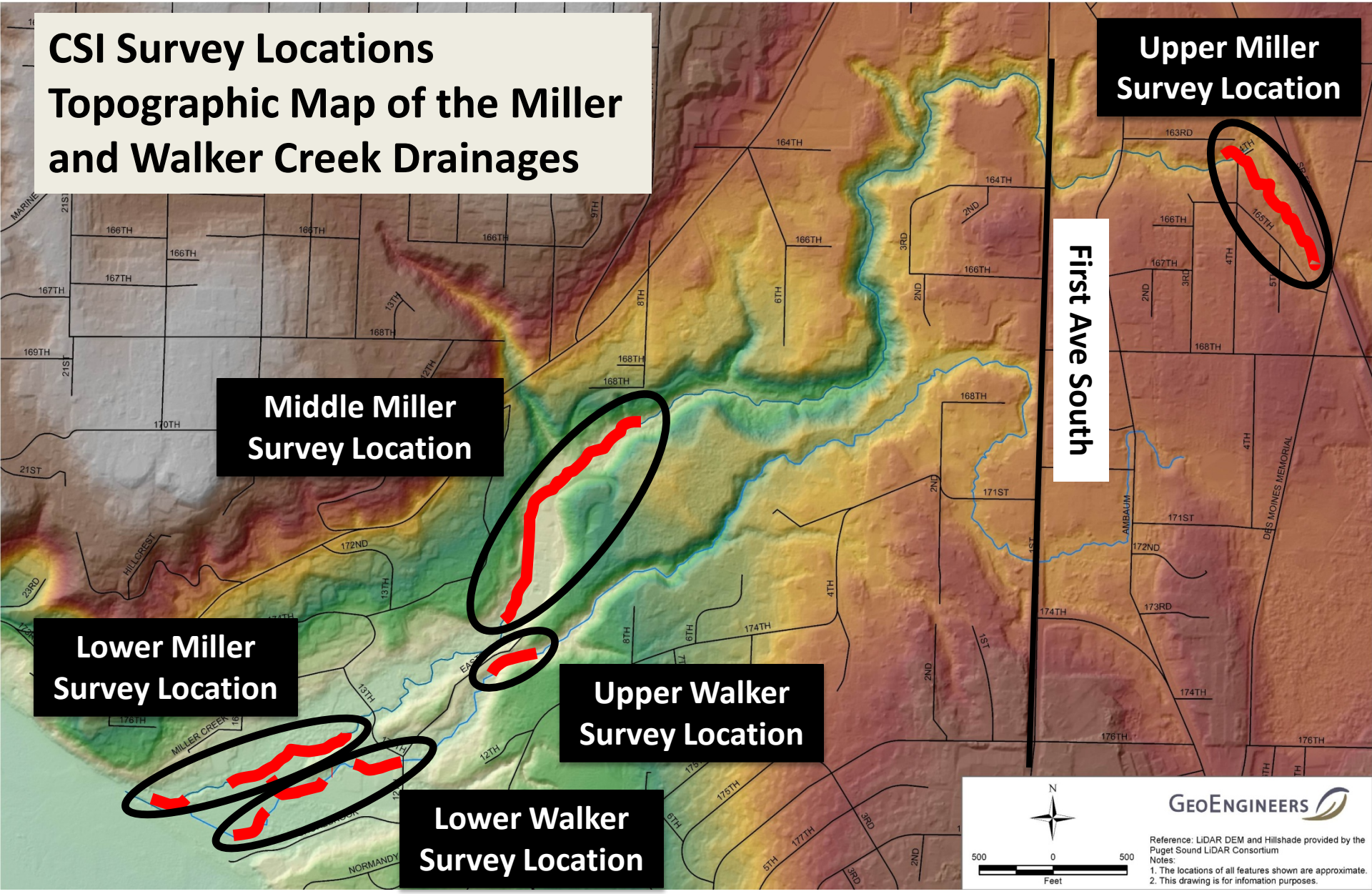


Image courtesy of GeoEngineers and Washington State Department of Transportation

Results: Live Fish Observations Summary

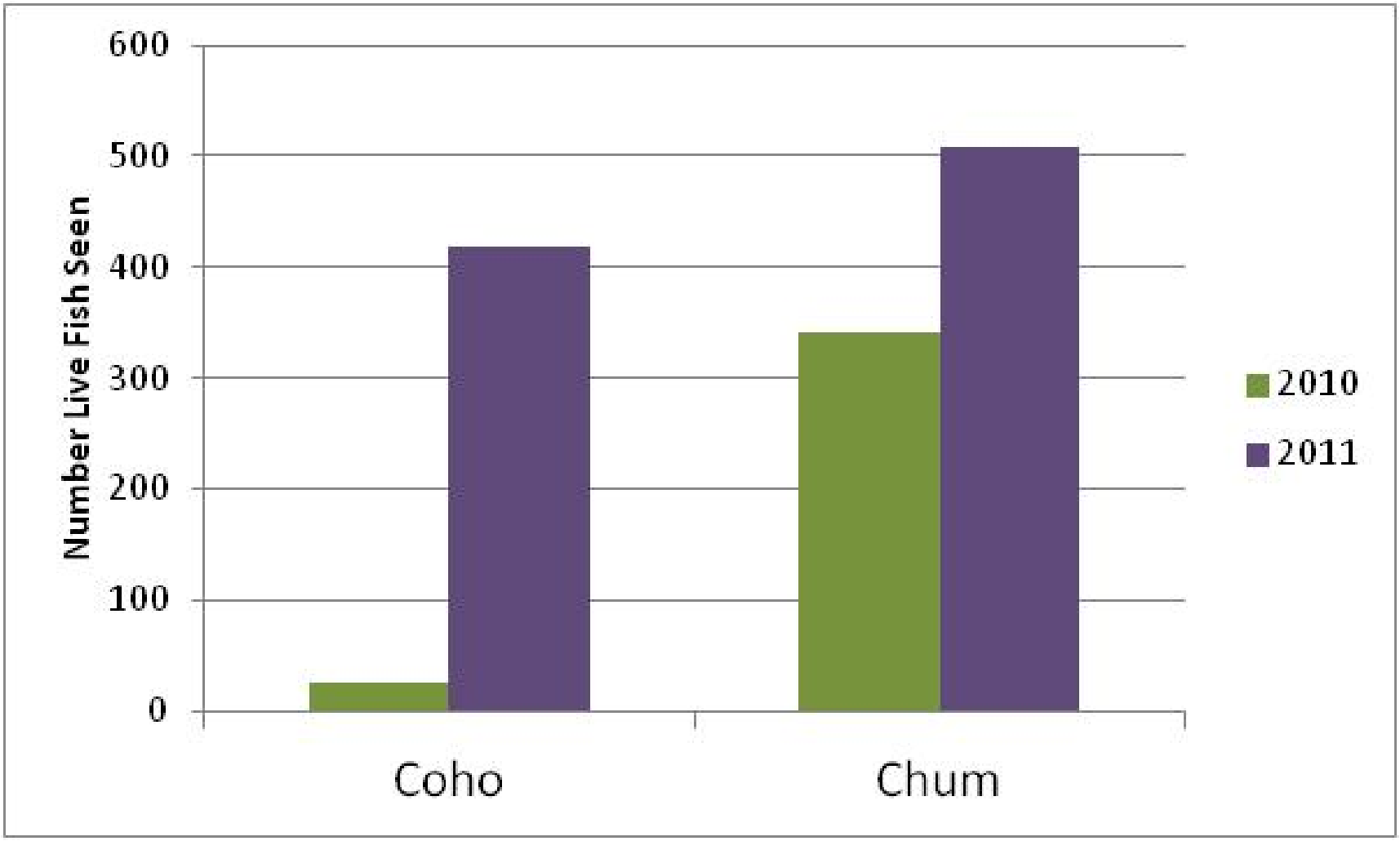
Species	Coho	Chum	Unidentified Adults
Miller Creek	262	158	43
Walker Creek	157	350	23
Total	**419**	**508**	**63**

Unidentified adults were 6.4% of total fish observed.

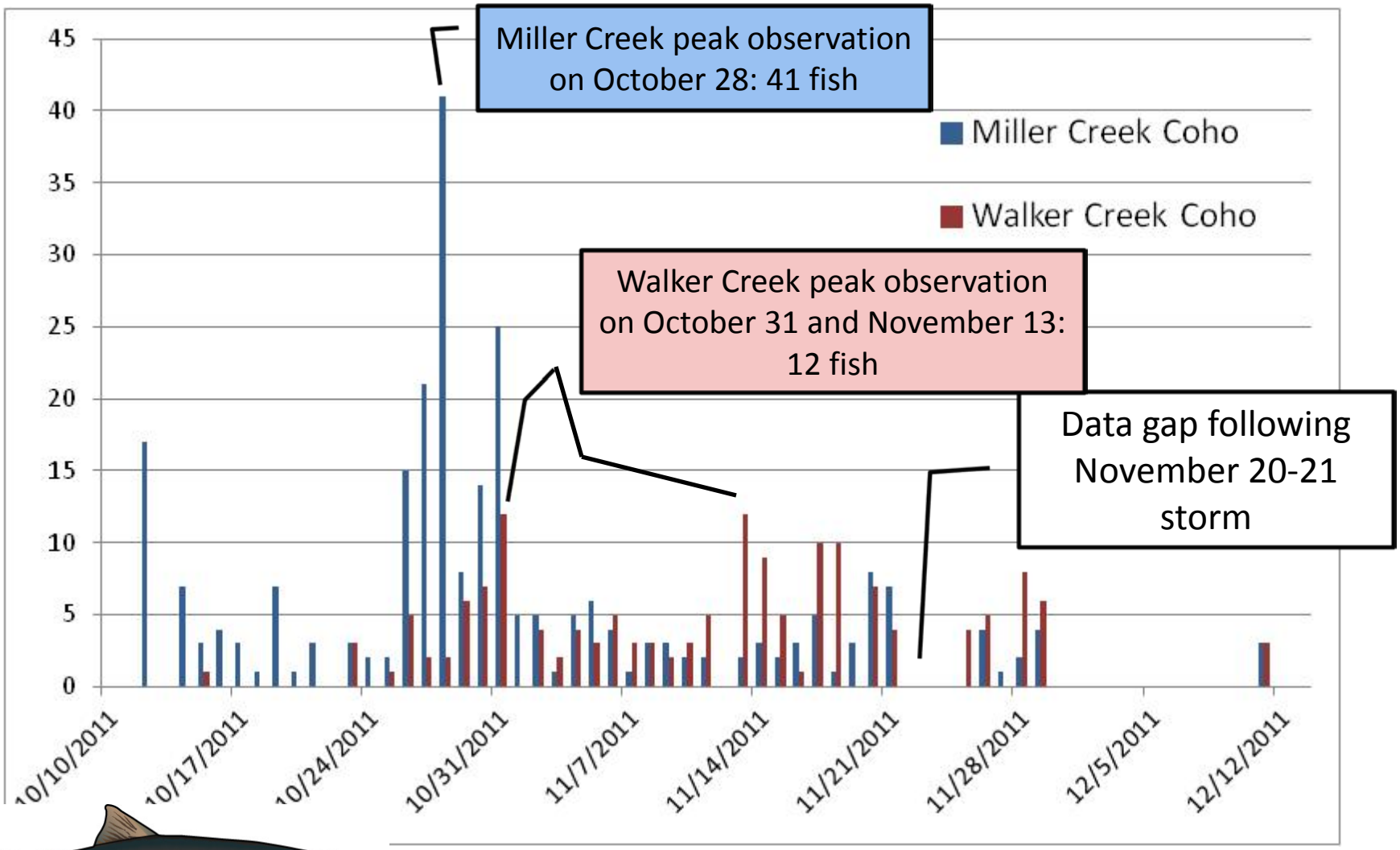
Results: Live fish, 2010 for comparison

Species	Coho	Chum	Unidentified Adults
Miller Creek	16	252	52
Walker Creek	9	90	10
Total	**25**	**342**	**62**

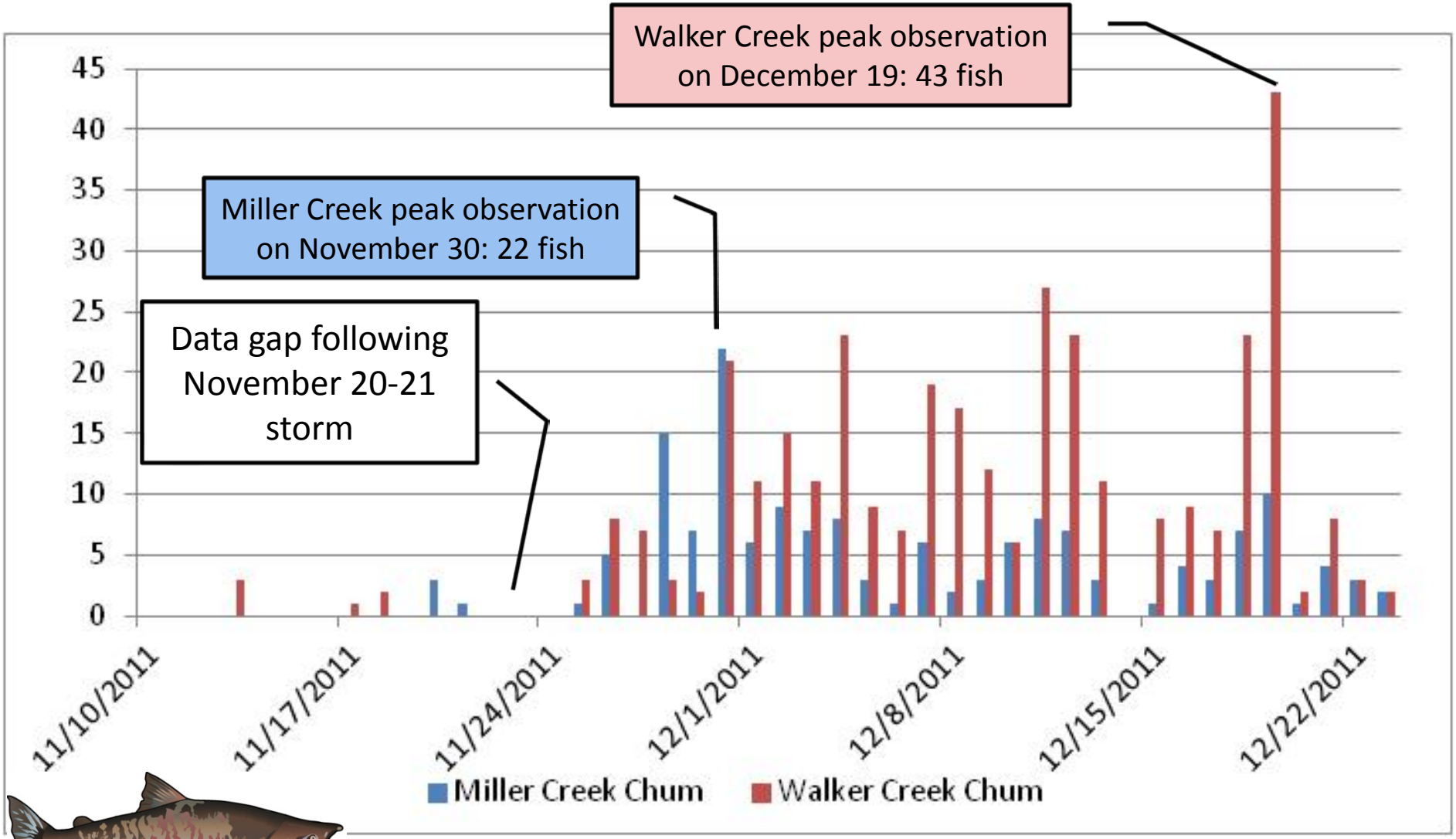
Results: 2010 vs. 2011



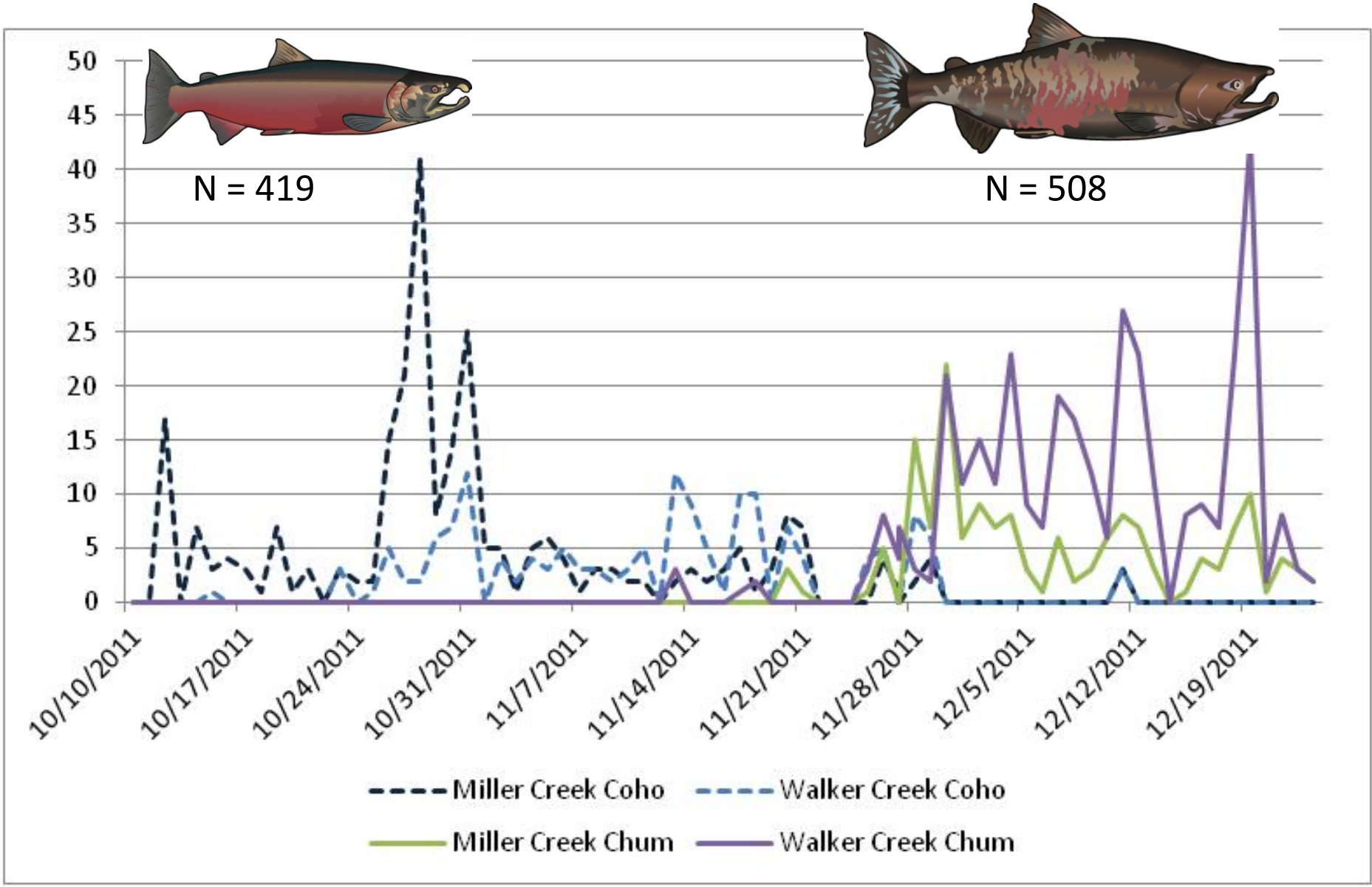
Results: 419 Coho Seen



Results: 508 Chum Observations

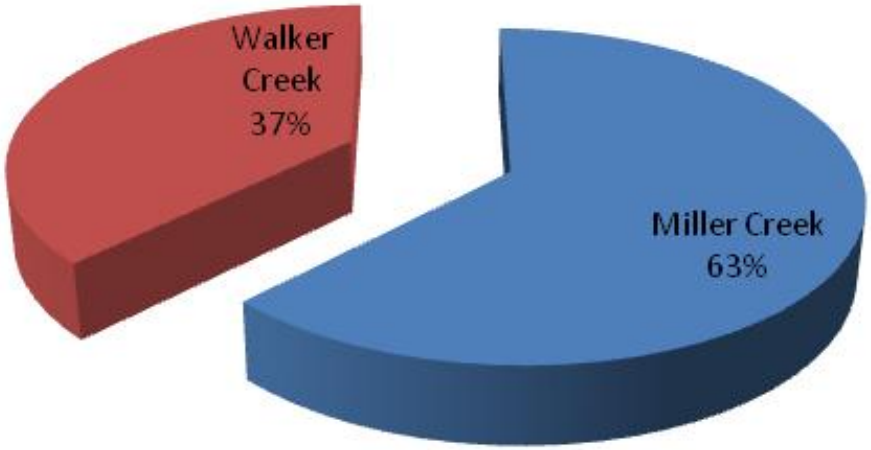


Species by Stream



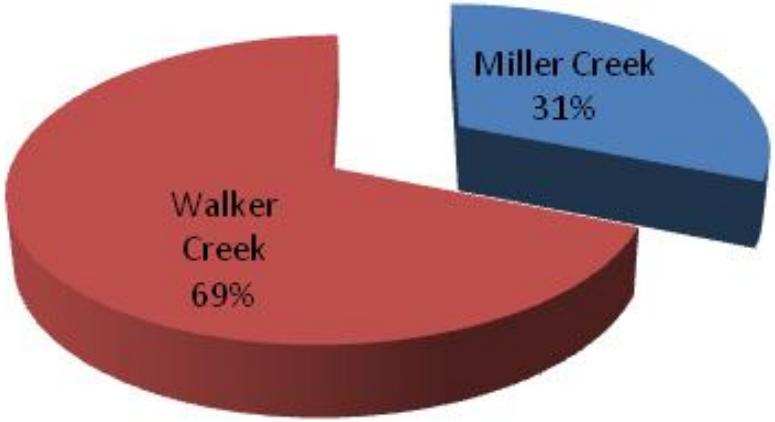
Species by Stream

Coho by Stream



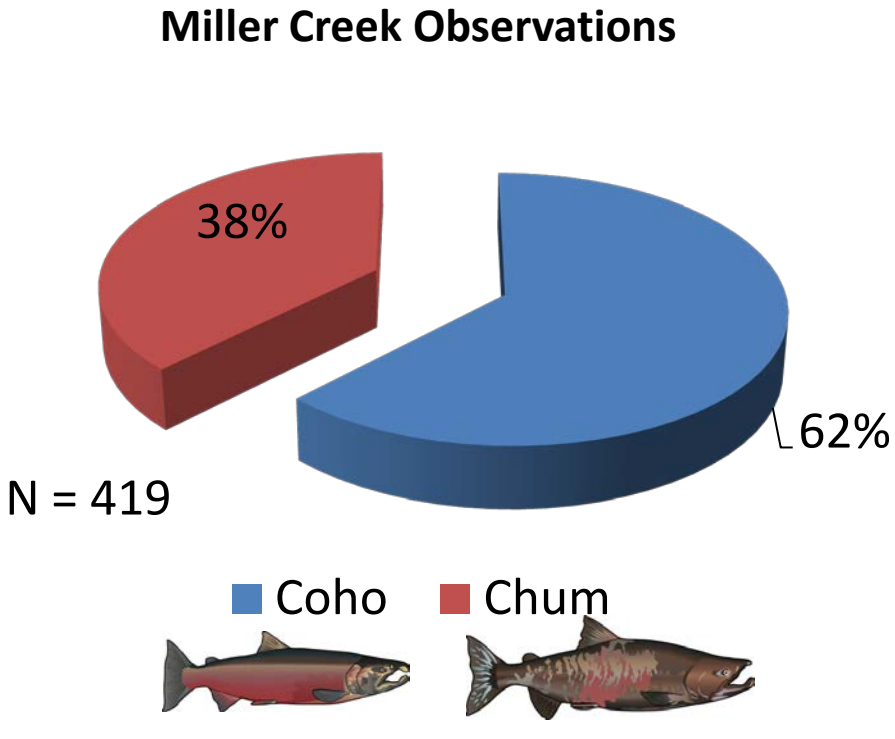
N = 419

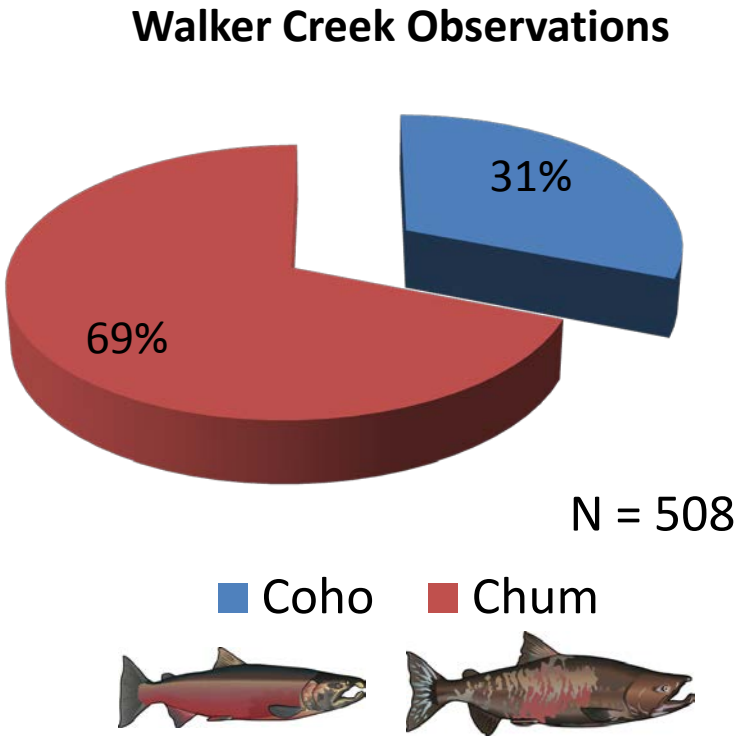
Chum by stream



N = 508

Use of Stream by Species





Estimated *Population*

Species	Coho	Chum	Total
Miller Creek	83	40	123
Walker Creek	46	125	171
Total	**129**	**165**	**294**

Assumptions:

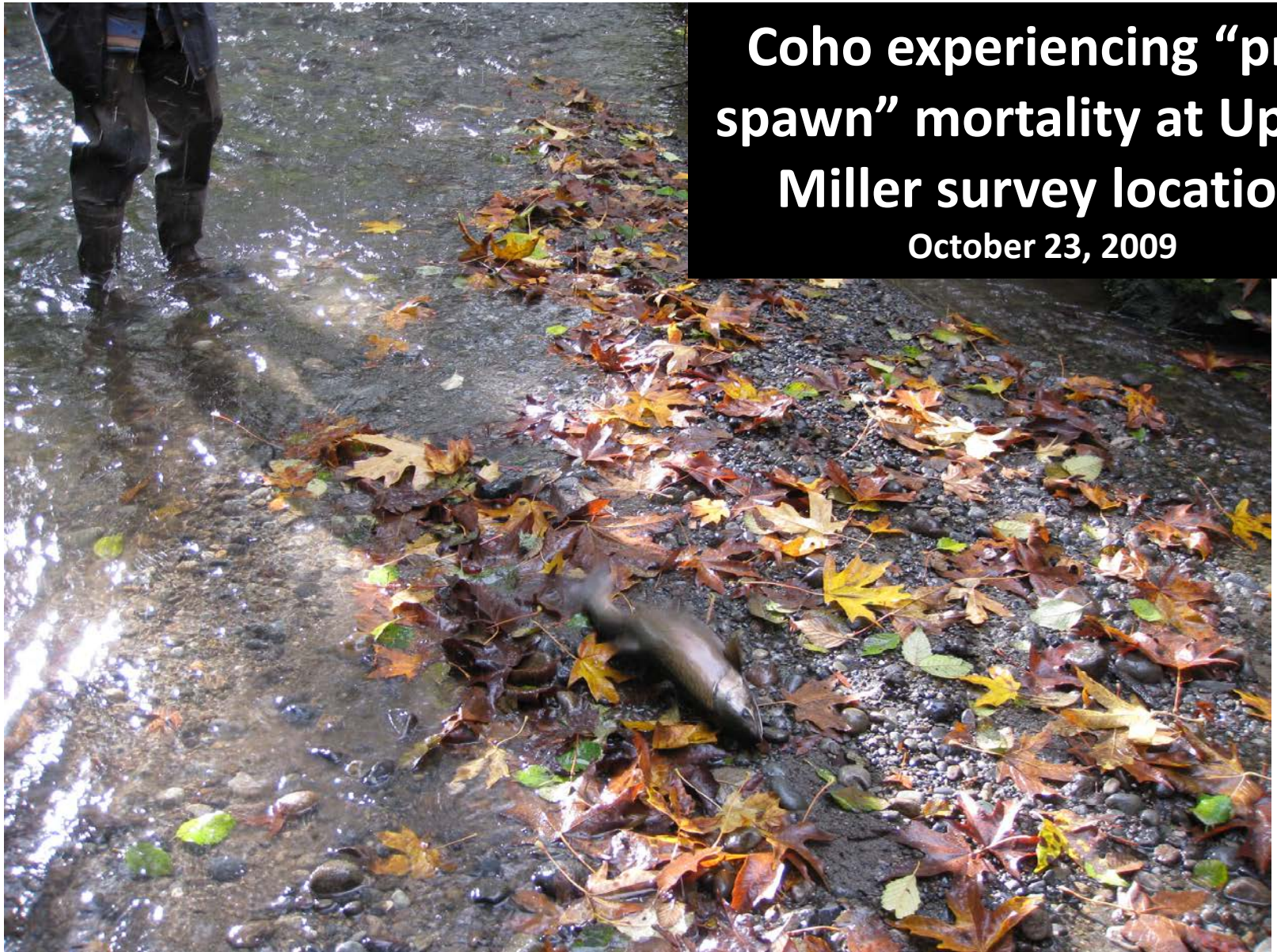
- Using several peak counts over the survey period corrects for probable double-counting of fish – salmon spend several days in the stream.

- The estimated population is the "escapement estimate" – the actual number of fish that are likely to have spawned.

Carcasses Summary

Species	Coho	Chum	Unidentified Adults
Miller Creek	69	44	13
Walker Creek	20	33	5
Total	**89**	**77**	**18**

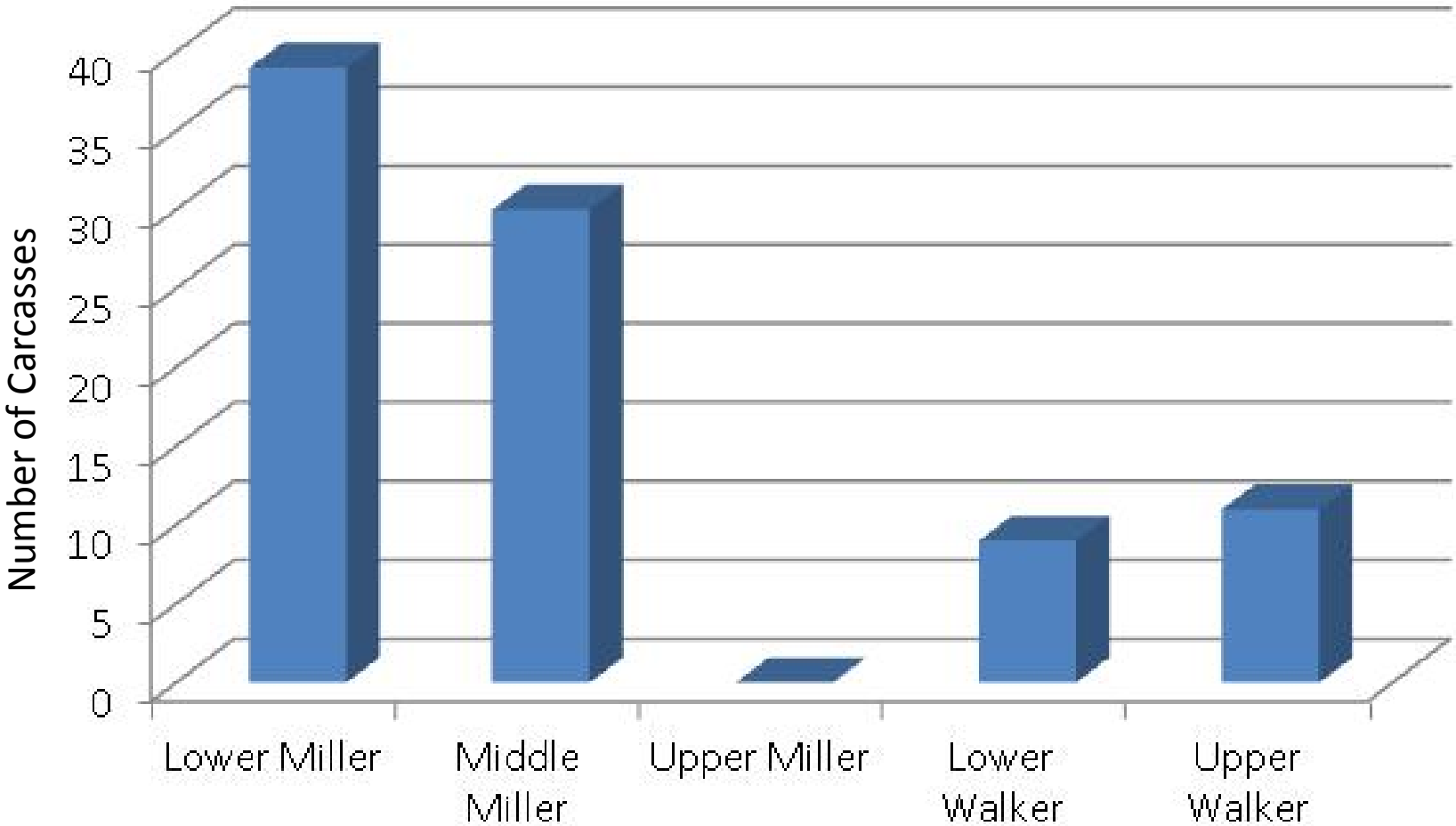
Pre-Spawn Mortality



Coho experiencing "pre-spawn" mortality at Upper Miller survey location

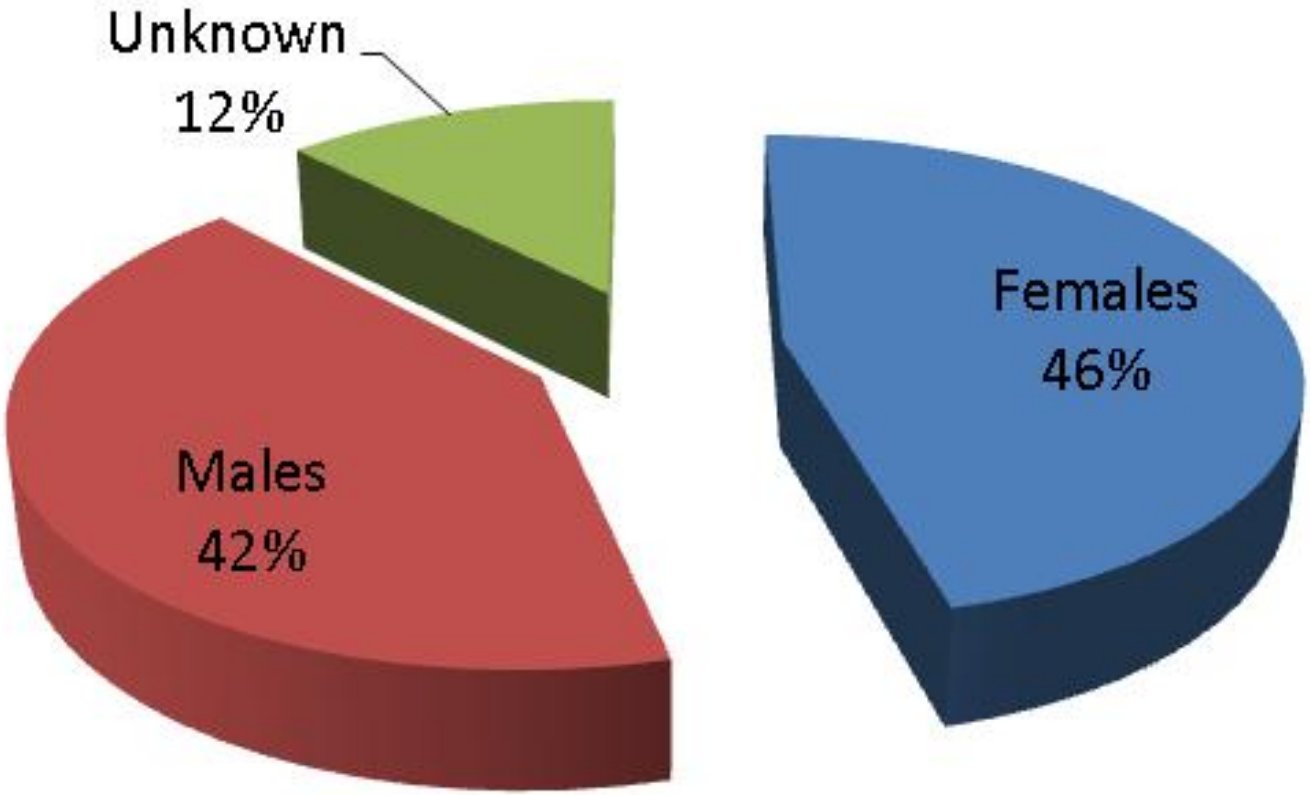
October 23, 2009

Coho Carcasses: Location



N = 89

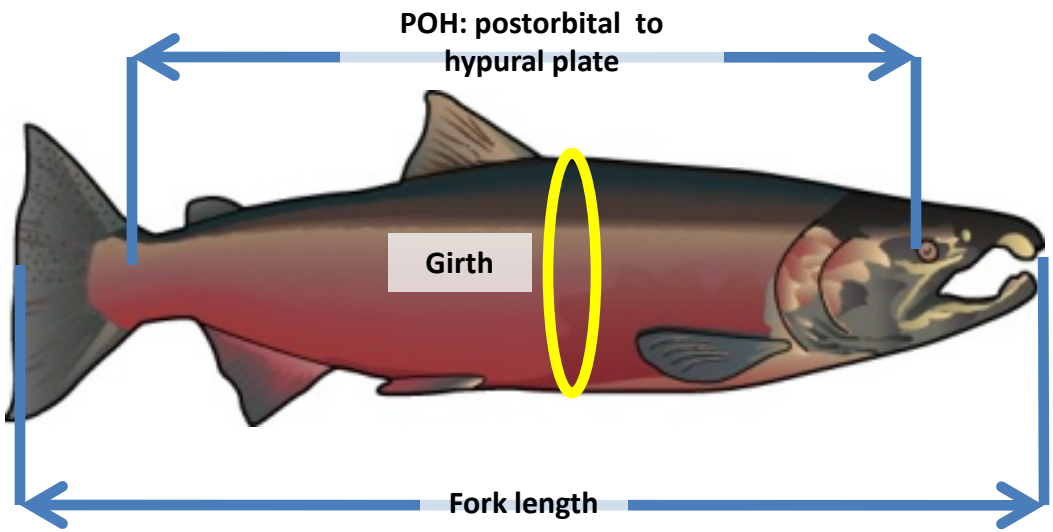
Coho Carcasses: Sex



N = 89

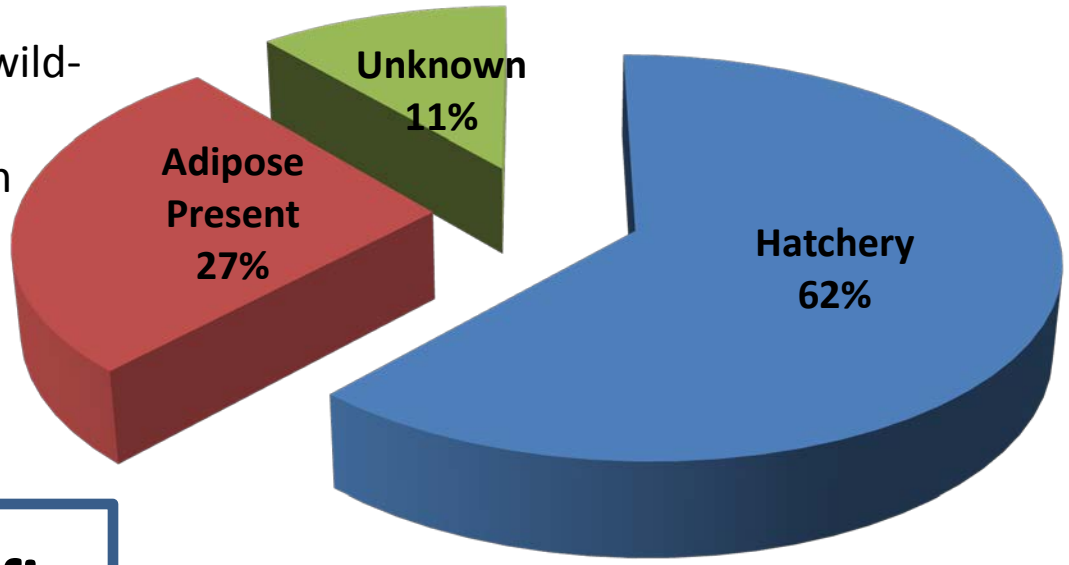
Coho Carcasses: Measurements

	Fork length (cm)	Girth (cm)	POH (cm)
Male average	58.7 (N = 37)	29.6 (N = 37)	44.3 (N = 37)
Female average	58 (N =41)	28.6 (N = 41)	44.7 (N = 41)



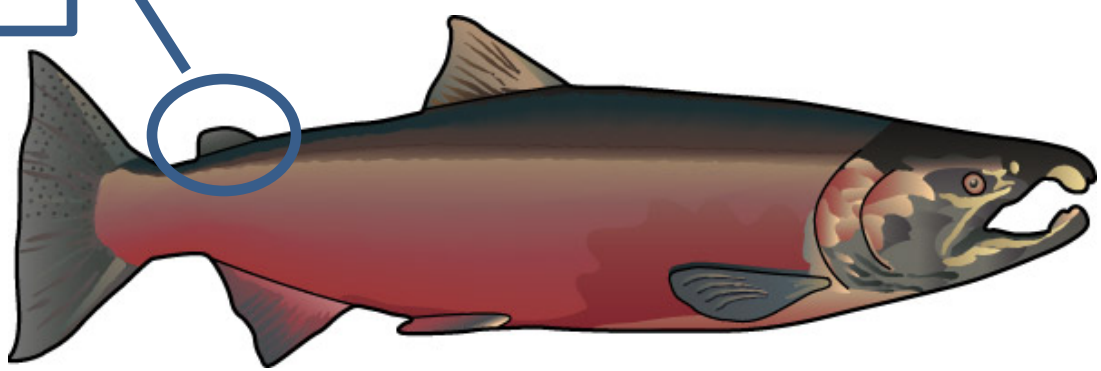
Coho: Hatchery Origin

24 fish were “wild-origin” or TU outplanted fish



55 fish originated from hatcheries outside of the basin and “strayed” into the streams to spawn

Adipose fin



N = 89

Collecting Coho Heads for Coded Wire Tag Analysis

"Sure, I'll carry that severed salmon head in my field bag…"

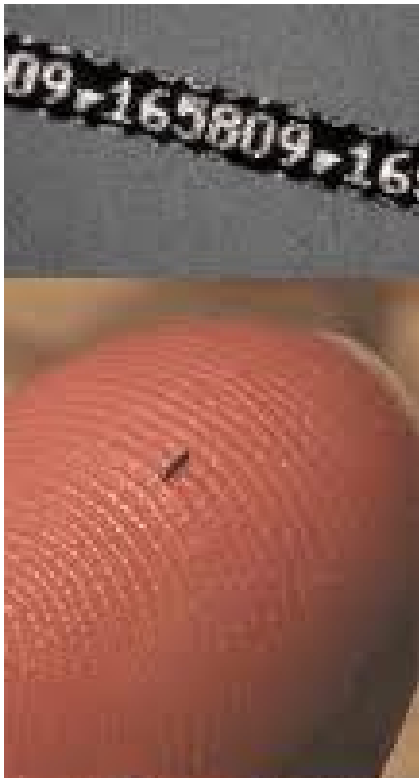


Image from Alaska Department of Fish and Game

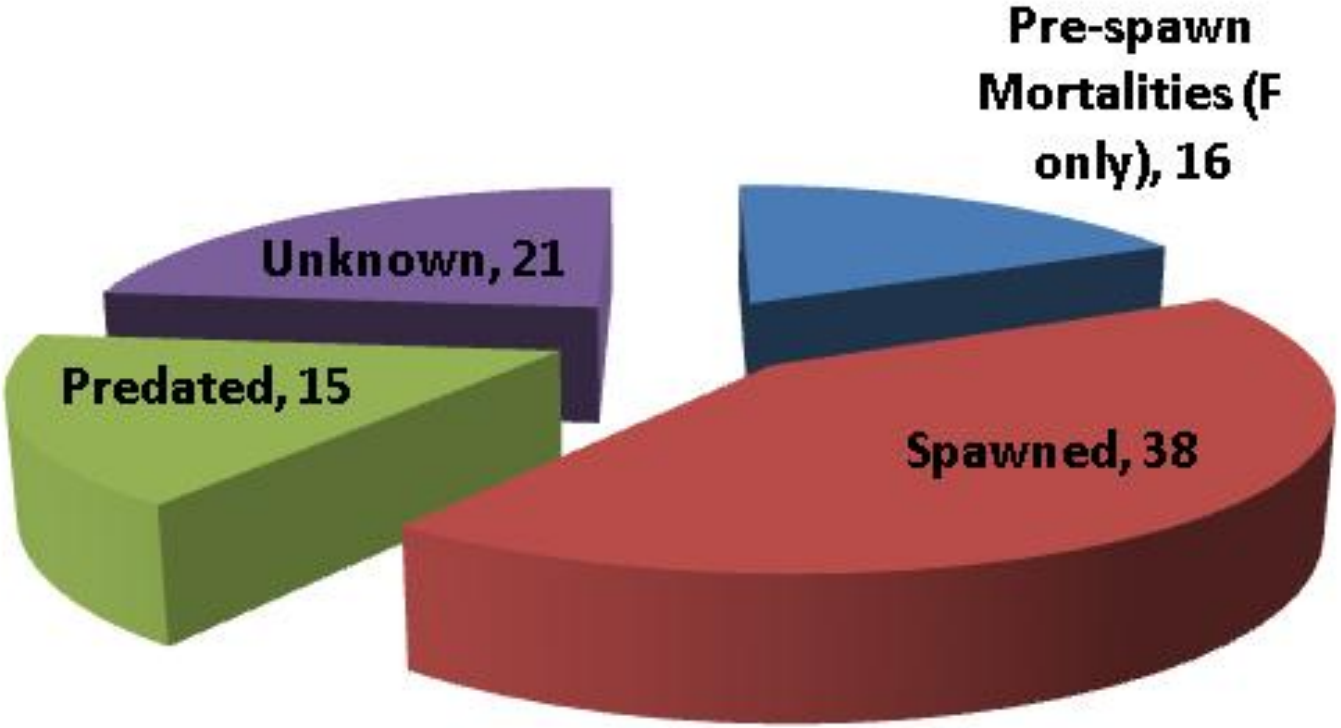
One Coded Wire Tag was found

- Coho from Elliot Bay – Muckleshoot Indian Tribes Net Pen
- Originally from Soos Creek Hatchery
- Fed for several years in pen
- Released in 2010 into Puget Sound

Coho: Success in Spawning

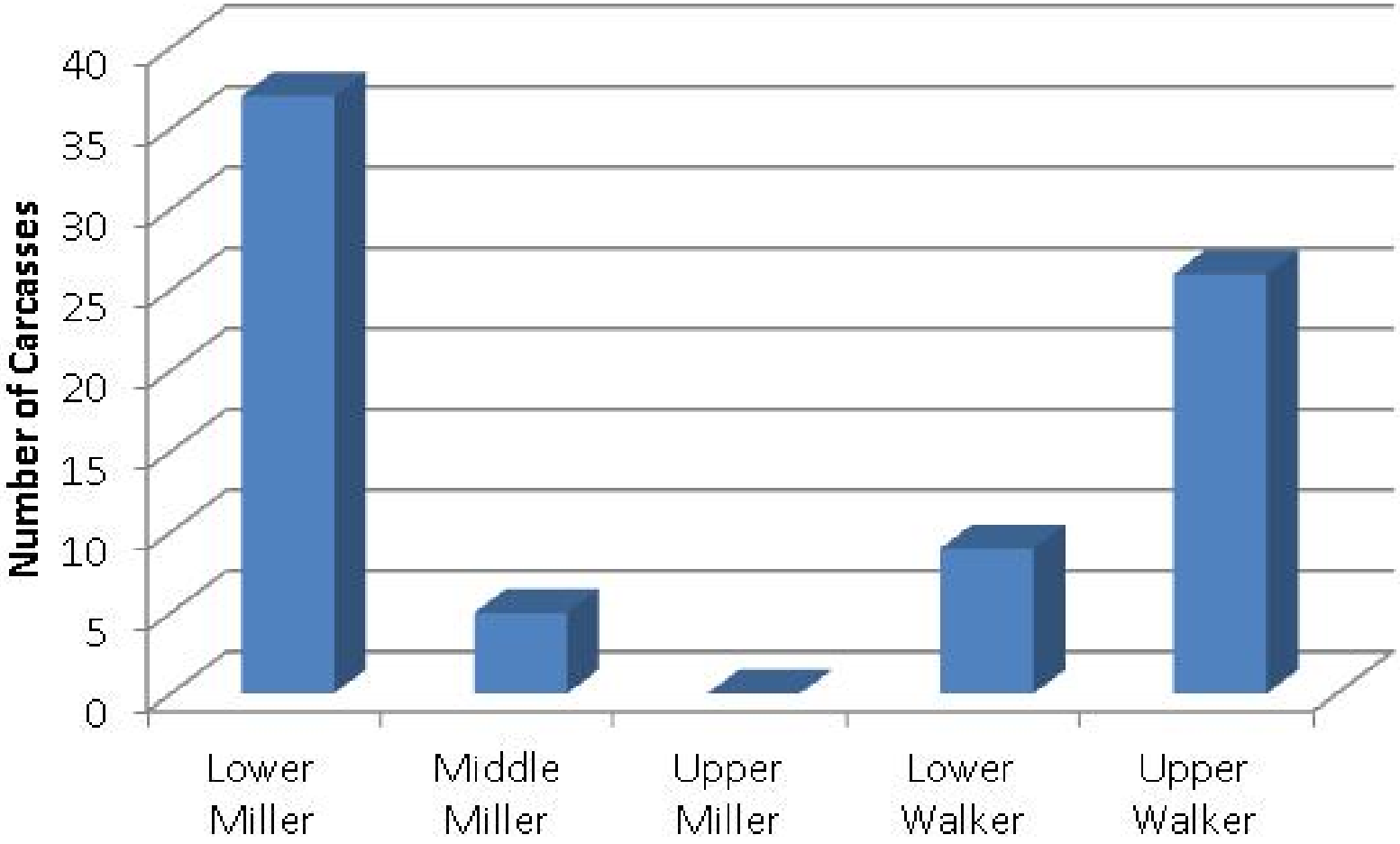
16 of 41 females died before spawning =

39% Pre-spawn Mortality



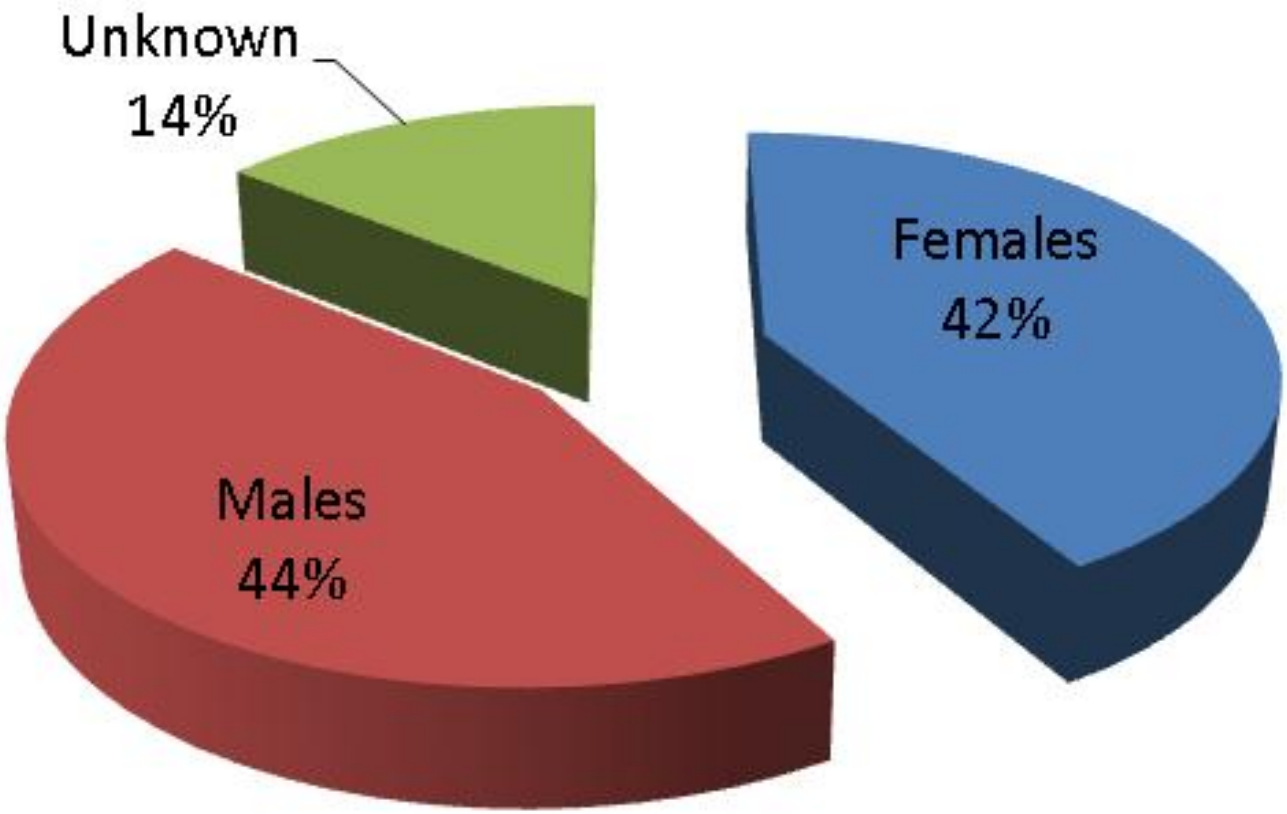
N = 89

Chum Carcasses: Location



N = 77

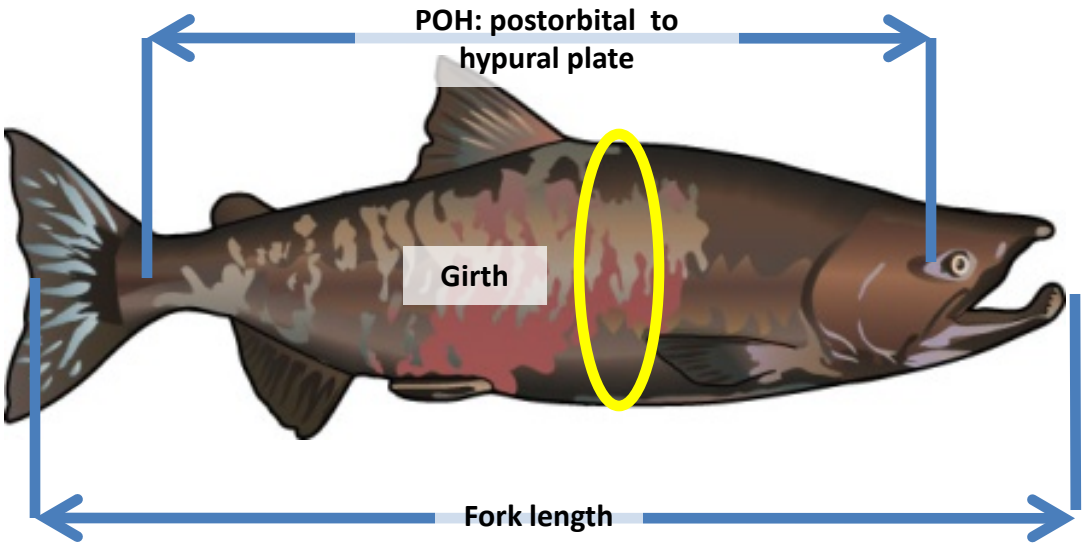
Chum Carcasses: Sex



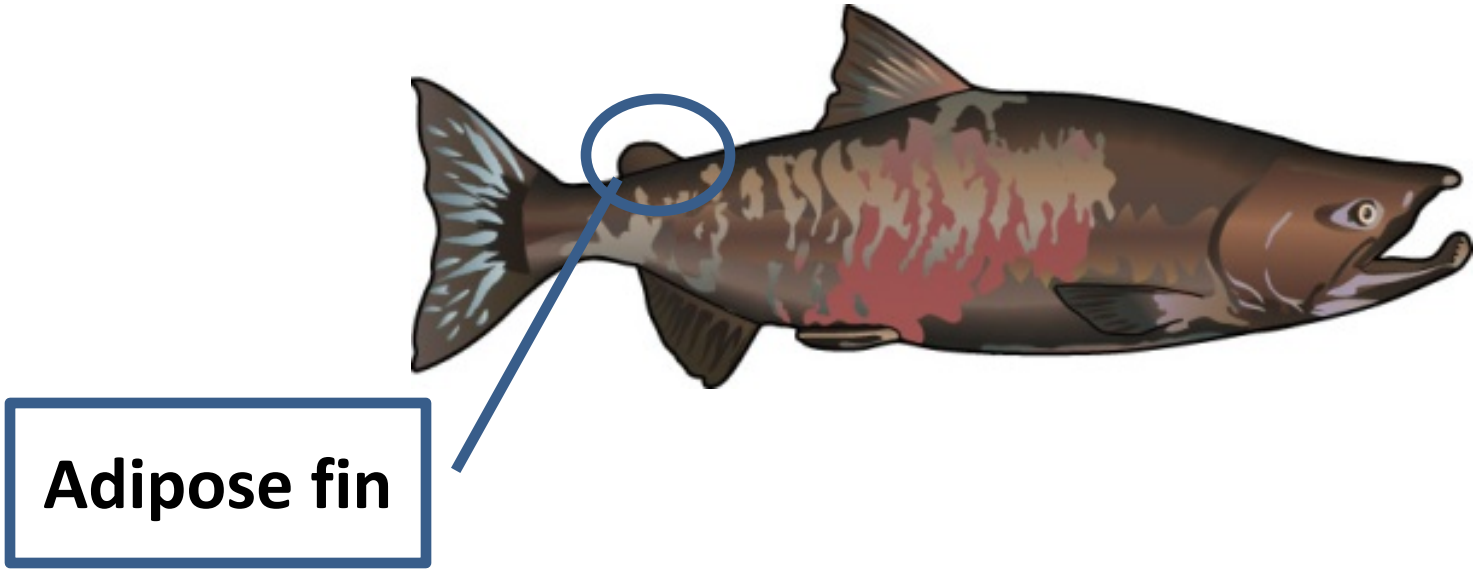
N = 77

Chum Carcasses: Measurements

	Fork length (cm)	Girth (cm)	POH (cm)
Male average (N = 34)	61.8	28.6	47.6
Female average (N = 32)	59.0	27	47.5



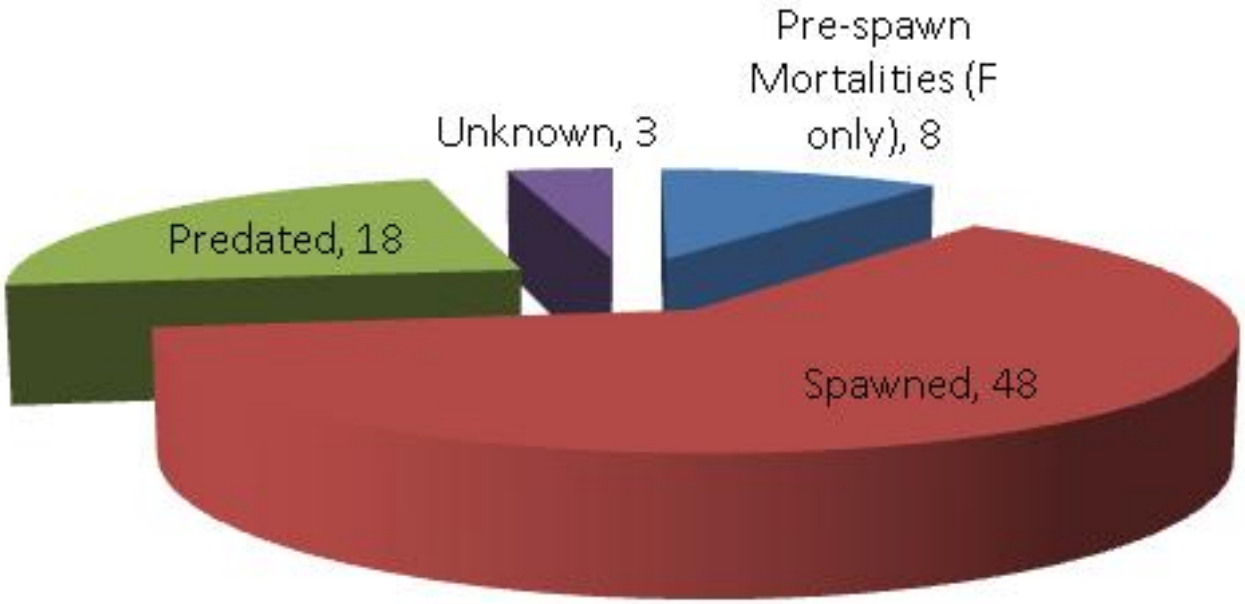
Chum: Hatchery Origin Unknown



Chum: Success in Spawning

8 of 32 females died before spawning =

25% Pre-spawn Mortality



N = 77

4) Plans for 2012 CSI

"Team Sunday"
Ethan prepares flagging for a carcass
December 5, 2010
Photo courtesy of David Bobanick

Plans for 2012 CSI Survey Season

- Continue the excellent work of 2010 and 2011 by surveying again at four initial locations in Normandy Park and one in Burien
- Monitor through end of chum spawning season
- Increase volunteer pool from 24 to 30 persons (including Highline School District seniors for culminating projects)