Interactions of Wild and Hatchery Pink Salmon and Chum Salmon in Prince William Sound and Chum Salmon in Southeast Alaska
2014 Progress

Prince William Sound Science Center
together with
Sitka Sound Science Center
For
Alaska Department of Fish and Game
Outline

- Introduction
- Overview 2014 Sampling Activities
  - PWS Ocean Sampling
  - PWS Stream Sampling
  - SEAK Stream Sampling
  - Alevin Sampling
- 2013 Hatchery-Wild Proportion Results
  - PWS Ocean Sampling
  - Streams
- Recommendations
- Discussion
Overarching Objectives
(for contracted parts of study)

- What is extent and annual variability in straying of hatchery pink salmon in Prince William Sound (PWS) and chum salmon in PWS and Southeast Alaska (SEAK)?

- What is the impact on fitness (productivity) of wild pink and chum salmon stocks due to straying of hatchery pink and chum salmon?
Scope of Project 2014

- Covers huge geography – all of Southeast and Prince William Sound
- Eleven field teams, directly employing 42 biologists and technicians
- Made 610 individual stream visits or ocean sampling days
- Collected 33,431 otolith samples and 11,567 DNA tissue samples
Overall Sampling Scheme

- PWS Ocean sampling – both species
- Hatchery-wild proportions of stream spawners:
  - PWS – Pink salmon and chum salmon (32 streams)
  - SEAK – Chum salmon (32 streams)
- Fitness study:
  - PWS – Pink salmon in 6 streams
  - SEAK – Chum salmon in 4 streams
HW Database and Field App
Finsight LLC

- SQL host database on server
- Apps for field data collection and uploading to database
  - Ocean sampling laptop app for
    - On board processing of catch and location information
  - Processing fish samples
- Stream data collected with Android app for 10-in tablet
  - Daily back-up to laptop and data review
- Field data transmitted to host
2014 Activities
Preliminary Progress Report submitted to ADF&G
Prince William Sound Ocean Test Fishery

Michele Buckhorn, PhD
Prince William Sound Science Center
Test Fishery May 15-August 30, 2014

- 32’ Bowpicker. 200 fathom net with 4 ¾, 4 3/8, 5 1/8, and 5 1/2 mesh
- 9 fixed stations (6 - Montague Strait; 3 - Hinchinbrook Entrance)
- 1 hour max sets. Whale pingers were attached to the net this year.
- Date, time, latitude and longitude were recorded in the database for each set.
Sample Collecting

- Fish were removed from the net and total catch recorded.
- Catches that exceeded the maximum sample number per station were systematically sampled to acquire the appropriate number.
- Catch from each station was tagged with a color coded floy tag, bled in the field, and put on ice.
- Chum and Pink samples beyond the maximum sample number were retained if it was determined they would not survive release.
Sample Processing

• Fish delivered to PWSSC personnel and separated by station and species.
• Morphometric data: total length (TL), standard length (SL), mid-eye socket to hypural bone length (MEH), total weight (TW), and sex (S).
• Otoliths were extracted and placed in individual cells in labeled trays provided by ADF&G.
• Fish in good condition were gutted and returned to ice to be sold under the ADF&G commercial fishing permit.
2014 Preliminary Results

- 12,607 salmon were caught in the ocean test fishery. 10 Chinook caught and 9 released
- Pink Salmon (9,400)
- Chum (1,198)
- Sockeye Salmon (1,644)
- Coho Salmon (355)
- 85% of catch from the Montague stations (10,732)
2014 Preliminary Results

- Mean CPUE (fish caught per fathom hour)
- Pink salmon: H02 0.020; M05 0.343
- Chum salmon: H02 0.009; M05 0.094
2014 Pink Salmon CPUE
2014 Chum Salmon CPUE
2014 Sex Ratios

<table>
<thead>
<tr>
<th>Species Common Name</th>
<th>count/percent</th>
<th>Female</th>
<th>Male</th>
<th>Unknown</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chum Salmon</td>
<td>count</td>
<td>496</td>
<td>411</td>
<td>1</td>
<td>908</td>
</tr>
<tr>
<td></td>
<td>percent</td>
<td>54.63%</td>
<td>45.26%</td>
<td>0.11%</td>
<td></td>
</tr>
<tr>
<td>Coho Salmon</td>
<td>count</td>
<td>2</td>
<td>7</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>percent</td>
<td>22.22%</td>
<td>77.78%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pink Salmon</td>
<td>count</td>
<td>640</td>
<td>973</td>
<td>2</td>
<td>1615</td>
</tr>
<tr>
<td></td>
<td>percent</td>
<td>39.63%</td>
<td>60.25%</td>
<td>0.12%</td>
<td></td>
</tr>
<tr>
<td>Sockeye Salmon</td>
<td>count</td>
<td>157</td>
<td>140</td>
<td></td>
<td>297</td>
</tr>
<tr>
<td></td>
<td>percent</td>
<td>52.86%</td>
<td>47.14%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- 2,831 salmon processed for weight-length measurements and otoliths extracted.
- Pink Salmon (1,615), Chum (908), sockeye (297), and Coho (9).
- Pink Salmon catch averaged about 60% male. Coho Salmon was highly skewed towards males, but this could be due to the small sample size. The remaining two species had close to 50/50 sex ratios.
Stream Sampling

- **Adult sampling 2013-2015**
  - Each stream visited at least three times per season in PWS and twice in SEAK
  - Straying Study -- Otoliths and other data collected from spawned out adults in all streams
  - Fitness Study – DNA also collected

- **Alevin sampling 2014-2016**
  - Spring redd pumping for fry in fitness streams
  - Test run on Fish and Stockdale creeks spring 2014
Consistent Stream Sampling Methods

- Written, detailed protocols
- Pre-season training
- Field app helped to guide sampling
- Fish collection – spawn outs or carcasses
- All streams
  - Otoliths, sex, length, by processing area location with lat-lons
  - Rough live/dead counts on most survey dates
- Fitness streams
  - DNA tissues (all fish)
  - Scales (chum only)
Stream studies of hatchery-wild pink and chum salmon interactions in Prince William Sound, Alaska, 2014

Kristen Gorman and Eric Knudsen
Prince William Sound Science Center, Cordova, AK
2014 Field Campaign PWS

- 32 study streams throughout PWS.
2014 Field Campaign PWS

- 32 study streams throughout PWS.
- 6 pedigree fitness streams for pinks.
  - Sampled every 3 days.
32 study streams throughout PWS.

6 pedigree fitness streams for pinks.
  - Sampled every 3 days.

28 pink straying streams.

- Stream Type:
  - pink fitness
  - pink straying only
  - chum straying only
  - pink and chum straying
2014 Field Campaign PWS

- 32 study streams throughout PWS.
- 6 pedigree fitness streams for pinks.
  - Sampled every 3 days.
- 28 pink straying streams.
  - 12 streams for stock structure analysis.
2014 Field Campaign PWS

- 32 study streams throughout PWS.
- 6 pedigree fitness streams for pinks.
  - Sampled every 3 days.
- 28 pink straying streams.
- 18 chum straying streams.
2014 Field Campaign PWS

- 32 study streams throughout PWS.
- 6 pedigree fitness streams for pinks. Sampled every 3 days.
- 28 pink straying streams.
- 18 chum straying streams.
- 5 field crews operating in PWS
PWS Vessel-Based Crews 2014: Cathy G and Auklet

- July 18 – September 20, 2014
- 3 port calls
  - ~Every 2 weeks
- Focus: stray streams
PWS Vessel-Based Crews 2014: Cathy G and Auklet

- August 3 – September 15, 2014
- 1 port call
- Focus: pedigree streams

Chart: D. Janka

Photo Credit: A. Chastan

Photo Credit: D. Janka
PWS Camping Crew: Paddy Bay

- August 3 – September 15, 2014
- Resupply via Cathy G
- Focus: pedigree streams

Photo Credit: D. Janka
Additional Field Crews: Texas A&M and Cordova-based

TAMU Crew
- Mid-July – August 20, 2014
- Focus:
  Spring Creek (pedigree),
  Sheep River,
  Windy Creek (Wei)

CDV Crew
- Mid-July – September 20, 2014
- Focus:
  Hartney Creek,
  Spring Creek (pedigree),
  2 trips to Coghill River,
  Humpback Creek (Wei)
Field Collections: Otoliths and Genetic Samples

Photo Credit: D. Janka
Field Collections: Otoliths and Genetic Samples
# 2014 PWS Sample Summary

<table>
<thead>
<tr>
<th></th>
<th>Pink</th>
<th>Chum</th>
<th>Pink-Stock Structure (Windy &amp; Humpback)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Otoliths</td>
<td>17,595</td>
<td>4,577</td>
<td>187</td>
<td>22,359</td>
</tr>
<tr>
<td>DNA-Pedigree</td>
<td>8090</td>
<td>N/A</td>
<td>N/A</td>
<td>8090</td>
</tr>
<tr>
<td>Stream Visits</td>
<td></td>
<td></td>
<td></td>
<td>285</td>
</tr>
<tr>
<td>Sampling Goal</td>
<td>23/28 streams &gt;384</td>
<td>8/18 streams &gt;384</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PWS 2013 & 2014 Pink Otolith Collections
PWS 2013 & 2014 Chum Otolith Collections

The graph shows the collections of chum otoliths from various creeks in 2013 and 2014. The x-axis represents different creeks: Beartrap Creek, Blackstone/Tebenkof Creek, Cabin Creek, Coghills River, Constantine Creek, Double Creek, Hartney Creek, Long Creek, Mill Creek, Paulson Creek, Siwash Creek, Spring Creek, Sunny River, Swamp Creek, Vanishing Creek, W. Finger Creek, Wells River. The y-axis represents the number of collections, ranging from 0 to 800. Each creek has two bars, one for 2013 (purple) and one for 2014 (orange), indicating the number of collections for each year.
Southeast Alaska Summer 2014

- More effective
  - More visits
  - Longer portions of stream
  - Good visit timing

- Major challenges
  - Low returns
  - Heavy Rainfall - Floods
  - Access
    - Marten, Chuck Rivers

Photo: Dale Adams
Summer Field Crews

- Sampled July 22 – Sept 2
- Pedigree crews
  - Juneau
  - Vessel
- Otolith crews
  - North
  - South
  - Tenakee Springs

Photo: Madison Kosma, Dylan Rhea-Fournier
Summer Field Crews

- Pedigree crews
  - Juneau
  - Vessel

- Otolith crews
  - North
  - South
  - Tenakee Springs

Photos: Alaska Coastal Outfitters, Adams Alaskan Safaris, Molly Kemp
Pedigree Streams

- Sawmill Creek
- Fish Creek
- Admiralty Creek
- Prospect Creek
- Juneau
Low Chum Returns

- Far fewer chums observed on many streams
- Fewer samples available
- Difficult to distinguish run timing

SSSC Peak Foot Survey Counts (Otolith-Only Streams)
2013 vs 2014
Low Chum Returns

- ADF&G Index counts - escapement below goals
  - Only Northern Outside met goal

Source: Piston, Heinl 2012
Record High rainfall June-August 2014 SE Alaska

- **Haines**: 278% Above Normal
- **Juneau**: 179% Above Normal
- **Petersburg**: 174% Above Normal
- **Klawock**: 144% Above Normal
High Water

- Unsafe
- Visibility issues
  - Can’t see/catch chum
  - Can’t get accurate counts
    - Difficult to assess run timing
- Washed away carcasses

Photos: Dale Brandenburger, Kelly Lawrence
Field Sampling

- Crews more effective in 2014
  - More visits
    - Pedigree streams – Every 3 days
    - Otolith streams – 2-5 visits/stream
  - Better coverage
    - More stream length
    - Visits corresponded with run timing
Otolith-only Field Sampling

- **Dynamic/flexible approach**
  - Schedule more efficient
    - In season changes
- **Communication**
  - Crewmembers in field
  - ADF&G Management Biologists
    - Aerial surveys
Otolith-only Field Sampling

- Fly-In
  - Sisters, Harding
- Accompanying ADF&G foot surveys
  - King Salmon River, Hidden Inlet, Carroll Cr.

Photos: Dale Adams, Ben Adams
Otolith-only Field Sampling

- Pedigree crews covered otolith streams
  - Chuck, Game, Freshwater
- Experienced/Motivated crews
  - Worked around tides/obstacles
  - Covered more stream length

Photo: Tory O’Connell
Results: Straying Study

- Visited all otolith-only streams 2-5 times
  - 81 otolith-only visits (2014) vs 65 visits (2013)
- Collected 8,241 total (4,761 from otolith-only)
  - Met goals at 6 of 28 streams
Data is Geo-referenced
Pedigree Field Sampling

- 2 field crews – more flexibility
  - 3rd vessel addition
  - Visits every 3 days
    - Except during high water
- Crewmembers rotated when needed
  - Fish Creek most productive

Photos: Ben Adams, Ashley Bolwerk
Results: Pedigree Streams

- Visited all Pedigree streams 13-19 times
    - 3,477 Otolith/Tissue samples
    - Sampled longer portions of stream, duration of run

<table>
<thead>
<tr>
<th>Stream</th>
<th>Visits</th>
<th>Otolith total</th>
<th>Tissue total</th>
<th>Scale Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prospect Creek</td>
<td>15</td>
<td>473</td>
<td>471</td>
<td>315</td>
</tr>
<tr>
<td>Admiralty Creek</td>
<td>16</td>
<td>260</td>
<td>260</td>
<td>236</td>
</tr>
<tr>
<td>Fish Creek</td>
<td>19</td>
<td>2623</td>
<td>2622</td>
<td>396</td>
</tr>
<tr>
<td>Sawmill Creek</td>
<td>13</td>
<td>124</td>
<td>124</td>
<td>123</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>63</strong></td>
<td><strong>3480</strong></td>
<td><strong>3477</strong></td>
<td><strong>1070</strong></td>
</tr>
</tbody>
</table>
Thank You

- **ADF&G**
  - Southeast Alaska Area Management Biologists & Staff
  - Gene Conservation Lab
  - Mark, Tag, and Age Lab
  - Dave Harris, Scott Forbes, Norm Miller - Whaler
  - Mark Stopha, Michelle Morris - Fish Cr help
  - Andy Piston, Malika Brunette, Phil Richards, Troy Jaecks, Jeff Williams

- **Sitka Sound Seafoods**

- **Sealaska Corporation**

- **Misty Bay Lodge**

- **Lucas Clark**

- **Temsco Helicopters**
Consistent Methods in Both Streams
Spring Alevin Sampling – Fish Creek

- Sampled Fish Creek March 25 – 31
  - Subdivided into 10 sections
    - Sampled all areas
    - Focused more intensely where heavy spawning was seen

- Alevins present in small clusters
  - Fine substrate

- Obstacles
  - Thick ice
  - Large substrate
at each location:
size of white dot represents no. of sample attempts
- 1 - 5
- 6 - 10
- 11 - 22

size of red dot represents no. of fish caught
- 1 - 10
- 11 - 50
- 51 - 132
## Spring Alevin Sampling

774 sample attempts (digs)

69 positive samples (757 alevins caught)

<table>
<thead>
<tr>
<th>Section #</th>
<th># of sample attempts</th>
<th>Avg. pump time (sec)</th>
<th>positive samples</th>
<th>% positive samples</th>
<th># chum caught</th>
<th># chum collected</th>
<th># pink caught</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>33</td>
<td>57.5</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
<td>0</td>
<td>27</td>
</tr>
<tr>
<td>2</td>
<td>39</td>
<td>72.7</td>
<td>1</td>
<td>1.4%</td>
<td>1</td>
<td>1</td>
<td>155</td>
</tr>
<tr>
<td>3</td>
<td>75</td>
<td>110.0</td>
<td>1</td>
<td>1.3%</td>
<td>1</td>
<td>1</td>
<td>112</td>
</tr>
<tr>
<td>4</td>
<td>104</td>
<td>84.4</td>
<td>14</td>
<td>13.5%</td>
<td>145</td>
<td>119</td>
<td>336</td>
</tr>
<tr>
<td>5</td>
<td>140</td>
<td>84.4</td>
<td>9</td>
<td>6.4%</td>
<td>92</td>
<td>71</td>
<td>86</td>
</tr>
<tr>
<td>6</td>
<td>103</td>
<td>81.7</td>
<td>3</td>
<td>2.9%</td>
<td>33</td>
<td>32</td>
<td>73</td>
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<tr>
<td>7</td>
<td>77</td>
<td>77.4</td>
<td>16</td>
<td>20.8%</td>
<td>215</td>
<td>168</td>
<td>244</td>
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<tr>
<td>8</td>
<td>59</td>
<td>91.0</td>
<td>12</td>
<td>20.3%</td>
<td>101</td>
<td>65</td>
<td>18</td>
</tr>
<tr>
<td>9</td>
<td>122</td>
<td>84.9</td>
<td>12</td>
<td>9.8%</td>
<td>162</td>
<td>106</td>
<td>286</td>
</tr>
<tr>
<td>10</td>
<td>32</td>
<td>86.5</td>
<td>1</td>
<td>3.1%</td>
<td>7</td>
<td>6</td>
<td>1</td>
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</table>
Alevin Stockdale Creek
April 4-6, 2014
Stockdale Creek Positive Pink Alevin Samples by Section

Legend
- Green: Section 1 - Lower intertidal
- Blue: Section 2 - High tide
- Red: Section 3 - Under ice
- Purple: Section 4 - Upper reach
- Black: Ice extent

<table>
<thead>
<tr>
<th>Section #</th>
<th># of sample attempts</th>
<th>positive samples</th>
<th>% positive samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>98</td>
<td>11</td>
<td>11.2</td>
</tr>
<tr>
<td>2</td>
<td>200</td>
<td>141</td>
<td>70.5</td>
</tr>
<tr>
<td>3</td>
<td>142</td>
<td>67</td>
<td>47.2</td>
</tr>
<tr>
<td>4</td>
<td>80</td>
<td>31</td>
<td>38.8</td>
</tr>
<tr>
<td>All</td>
<td>520</td>
<td>250</td>
<td>48.1</td>
</tr>
</tbody>
</table>

Total Pinks captured 2,091
2013 Preliminary Results

- Ocean Sampling H-W Proportions
- Stream H-W Proportions
2013 Results

- 5,691 salmon were caught in the ocean test fishery.
- Pink Salmon (3,458)
- Chum (1,305)
- Sockeye Salmon (655)
- Coho Salmon (272).
- 75% of catch from the Montague stations (4,251)
2013 CPUE

- Mean CPUE (fish caught per fathom hour) ranged from 0.344 (H02) to 3.54 (M05)
- CPUE peaked at different stations at different times
- H01 peaked early in the season while M05 slowly increased and then peaked towards the end of the season.
- H02 was consistently low the entire season - location in the middle of Hinchinbrook Entrance.
2013 SEX RATIOS

- 2,671 salmon processed for weight-length measurements and otoliths extracted.
- Pink Salmon (1,515), Chum (947), sockeye (163), and Coho (46).
- Pink Salmon catch averaged about 75% male while the remaining three species had close to 50/50 sex ratios

<table>
<thead>
<tr>
<th>CommonName</th>
<th>Count/Percent</th>
<th>Female</th>
<th>Male</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chum Salmon</td>
<td>Count</td>
<td>509</td>
<td>430</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>53.75</td>
<td>45.41</td>
<td>0.84</td>
</tr>
<tr>
<td>Coho Salmon</td>
<td>Count</td>
<td>22</td>
<td>24</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>47.83</td>
<td>52.17</td>
<td>0</td>
</tr>
<tr>
<td>Pink Salmon</td>
<td>Count</td>
<td>420</td>
<td>1086</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>27.69</td>
<td>71.59</td>
<td>0.73</td>
</tr>
<tr>
<td>Sockeye Salmon</td>
<td>Count</td>
<td>81</td>
<td>82</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>49.39</td>
<td>50</td>
<td>0.61</td>
</tr>
</tbody>
</table>

![Bar chart showing sex ratios for Chum, Coho, Pink, and Sockeye Salmon](chart.png)
2013 Pink Salmon Hatchery Wild Proportions
2013 Chum Salmon Hatchery Wild Proportions
H-W Proportions in Streams
Pink Salmon Streams 2013

Hartney Creek

Spring Creek (pedigree)

Beartrap Creek
Pink Salmon Streams 2013

Surplus Creek

8/1/13 Wild
8/8/13 Hatchery
9/17/13 Hatchery

Siwash Creek

8/8/13 Pink Salmon
8/25/13 Pink Salmon
9/18/13 Pink Salmon

Coghill River

8/9/13 Pink Salmon
Pink Salmon Streams 2013

Double Creek 8/6/13

Pink Salmon

Wild Hatchery
Chum Salmon Streams 2013

Hartney Creek

7/19/13
Wild
Hatchery
Chum Salmon

7/24/13
Wild
Hatchery
Chum Salmon

8/2/13
Wild
Hatchery
Chum Salmon

8/13/13
Hatchery
Hatchery
Chum Salmon

Beartrap Creek

7/20/13
Wild
Hatchery
Chum Salmon

7/29/13
Wild
Hatchery
Chum Salmon
Chum Salmon Streams 2013

Vanishing Creek

Wells River

7/22/13
8/1/13
8/8/13
8/25/13

7/31/13
8/7/13
8/24/13

Wild
Hatchery
Wild
Hatchery
Wild
Hatchery
Wild
Hatchery
Chum Salmon Streams 2013

Swamp Creek

Cabin Creek
Chum Salmon Streams 2013

Constantine Creek

Double Creek
Fishing District 111 SEAK 2013

Admiralty Creek

7/29/13
Hatchery: Wild

7/30/13
Hatchery: Wild

8/6/13
Hatchery: Wild

Chum Salmon

8/7/13
Hatchery: Wild

8/8/13
Hatchery: Wild

8/15/13
Hatchery: Wild

8/22/13
Hatchery: Wild

Fish Creek

7/21/13
Hatchery: Wild

7/24/13
Hatchery: Wild

8/1/13
Hatchery: Wild

8/2/13
Hatchery: Wild

8/12/13
Hatchery: Wild
Fishing District 112 SEAK 2013

Ralph’s Creek
7/20/13
Chum Salmon

7/25/13
Chum Salmon

Seal Bay Head Creek
7/27/13
Chum Salmon

8/3/13
Chum Salmon

8/6/13
Chum Salmon

8/15/13
Chum Salmon

Freshwater Creek
8/6/13
Chum Salmon

8/15/13
Chum Salmon

Chaik Bay
7/28/13
Chum Salmon

8/21/13
Chum Salmon
Fishing District 112 SEAK 2013

Whitewater Creek

8/7/13
Wild
Hatchery
Chum Salmon

8/19/13
Wild
Hatchery
Chum Salmon
Fishing District 113 SEAK 2013

W Crawfish NE Arm Head

8/13/13

Wild

Hatchery

Chum Salmon

Rodman Creek

7/20/13

Wild

Hatchery

Chum Salmon

7/27/13

Wild

Hatchery

Chum Salmon

8/9/13

Wild

Hatchery

Chum Salmon

Ushk Bay W End

8/10/13

Wild

Hatchery

Chum Salmon

8/11/13

Wild

Hatchery

Chum Salmon

Sister Lake SE Head

8/15/13

Wild

Hatchery

Chum Salmon

8/25/13

Wild

Hatchery

Chum Salmon
Fishing District 113 SEAK 2013

Ford Arm Creek

8/14/13

Wild Hatchery

Chum Salmon

8/24/13

Wild Hatchery

Chum Salmon
Fishing District 114-115 SEAK 2013

Game Creek
7/29/13

Wild
Hatchery

Chum Salmon

Sawmill Creek

7/23/13

Hatchery
Wild

Chum Salmon

8/9/13

Hatchery
Wild

Chum Salmon

8/10/13

Hatchery
Wild

Chum Salmon

8/14/13

Hatchery
Wild

Chum Salmon
Future Directions – PWS Ocean Sampling

- Continue Ocean Sampling in 2015
  - Third year will help for interannual variation
  - Total estimates of run size
  - Parallels stream work
Future Directions –
PWS & SEAK Stream Sampling

- Several SEAK streams had so few chum present that there may never be enough samples to contribute to the experimental analysis.
  - Glen Creek - SEAK
  - Greens Creek - SEAK
  - Saginaw Bay - SEAK
  - Swan Cove Creek – SEAK

- A few PWS streams had few pinks or chum
  - Spring Creek (fitness) 2014
  - Blackstone Creek 2013 and 2014
Future Directions – Pedigree Sampling

- For fitness streams, clarify which spawn-outs and carcasses should be sampled and which should not
  - If carcasses are very rotten should they be sampled or not?
  - Should dead, partially spawned Chum/Pink Salmon be sampled?
  - On live, partially spawned fish, we have been using the criteria of “sample if nearly all gametes have been expelled”
  - What about adults that have been preyed upon either prior to spawning, partially spawned, or post spawning?
Future Directions – Large Stream/River Sampling

- Access options will clearly be more expensive so budget issues will need to be considered as well.

- **PWS Streams:**
  - Sheep River
  - Beartrap Creek
  - Wells River
  - Sunny River
  - Coghill River (lake)
  - Constantine Creek
  - Double Creek
  - Bainbridge Creek (lake)
  - Gilmour Creek (lake)

- **SEAK streams:**
  - Marten River
  - Harding River
  - Chuck River
  - Kadashan River
  - King Salmon River
  - Greens Creek
  - Game Creek
Future Directions – Sample Collection

- Improve the process for collecting, storing, and separating the fitness stream DNA tissues and otolith samples
  - 48-DWPs are difficult to seal -- Ethanol occasionally leaked or evaporated out of plates after they were fully sealed and tightly wrapped in plastic
  - A lab technician must remove the otoliths from the 48-DWP and transfer to an otolith tray for shipping to the respective ADF&G processing lab
    - This creates another source of potential error, which may be largely undetectable.
Future Directions – Sample Collection

- Improve the trays in which samples are stored on otolith-only streams
  - The 96-well plates, while efficient, require extreme care to avoid tipping and spilling when in the field
  - Unlike 48 DWPs, the 96 well plates require crewmembers to remove the lid altogether when sampling
  - If possible, a larger, sturdier tray would be much preferable for streamside otolith collecting
  - Alternatively, a larger, rigid plate to contain the tray, much like that used to support the 48 DWPs, would better suit this field work
Future Directions – Sample Collection

- Improve labels for otolith and 48-DWP trays
- Problems with tray labels smearing and disintegrating, especially in rainy weather and rough field conditions
  - Labels for each type of tray 48 dwp and 96-well each have their unique challenges
  - If trays were “permanently” labeled with more rugged and weatherproof labeling, they could be better tracked via barcoding.