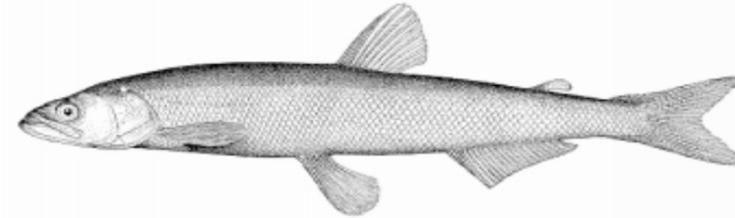




Fisheries and Oceans
Canada

Pêches et Océans
Canada



Update on Eulachon from Canada

Sean MacConnachie

Species at Risk Biologist, DFO

Eulachon State of the Science and
Science to Policy Forum

August 21st, 2015



Canada

Acknowledgements

- Ken Fong, Offshore small mesh survey
- Bruce McCarter, Egg and Larval in-river survey
- John Candy, Genetics

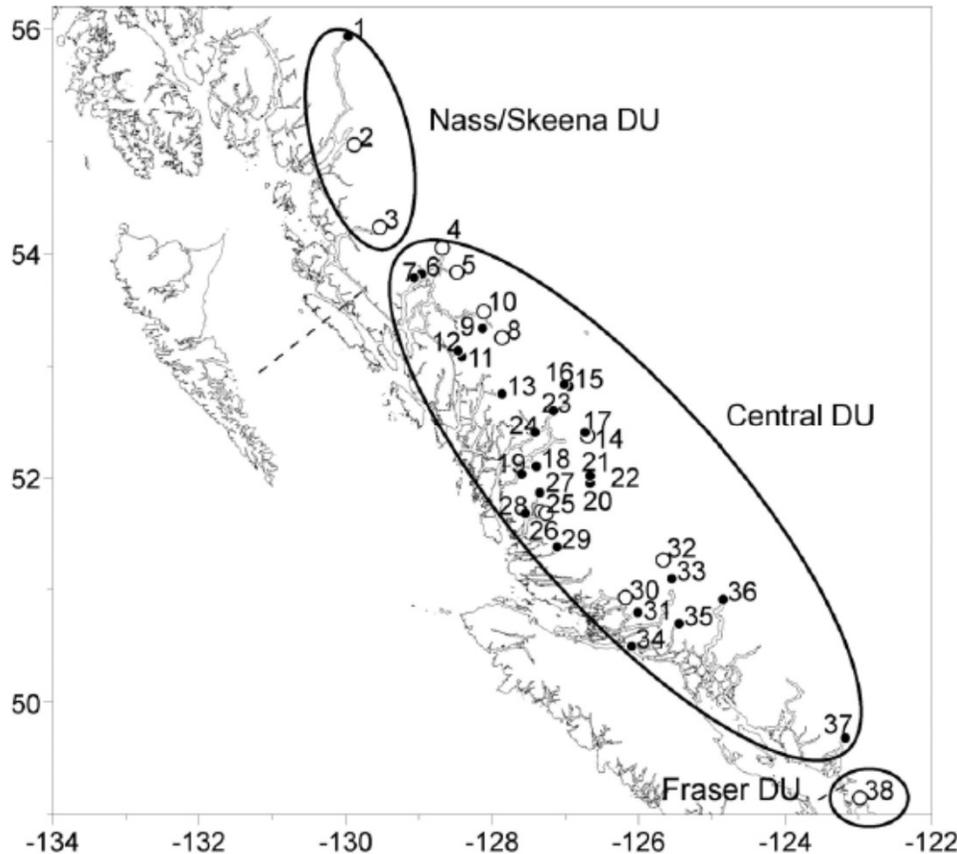


Overview

- Eulachon in Canada
- DFO Led Research Initiatives
- Listing and Recovery Activities

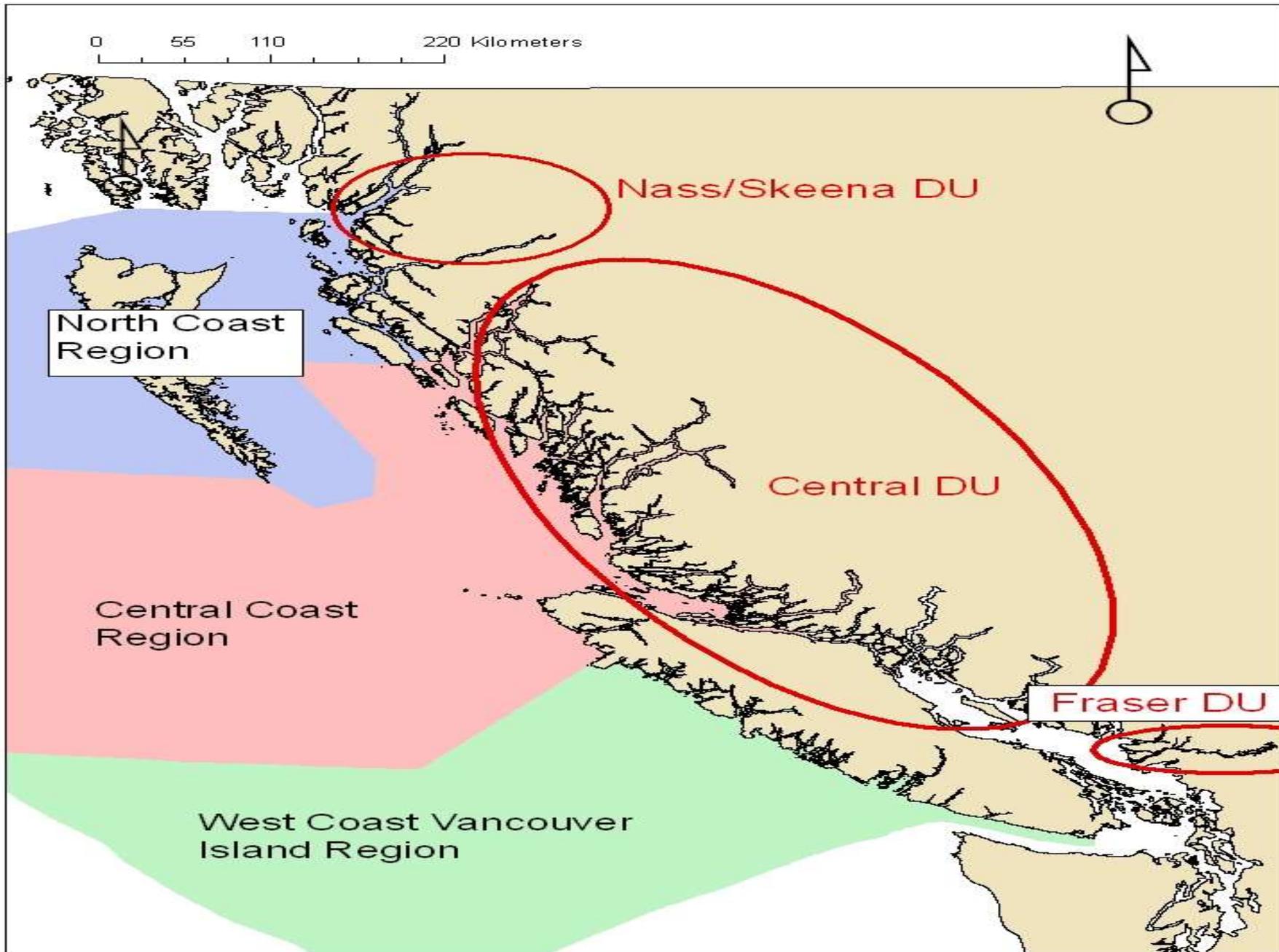


Eulachon DUs



- **Fraser River**
 - Genetic data indicates isolation from other Canadian spawning populations
 - Drain basin extends inland
- **Central Pacific Coast**
 - Genetic data indicates separation from rivers to the north and south
 - Headwaters of rivers in Coast Mountain range
- **Nass / Skeena**
 - High degree of genetic separation between these two rivers and the other rivers in Canada
 - Headwaters in BC interior

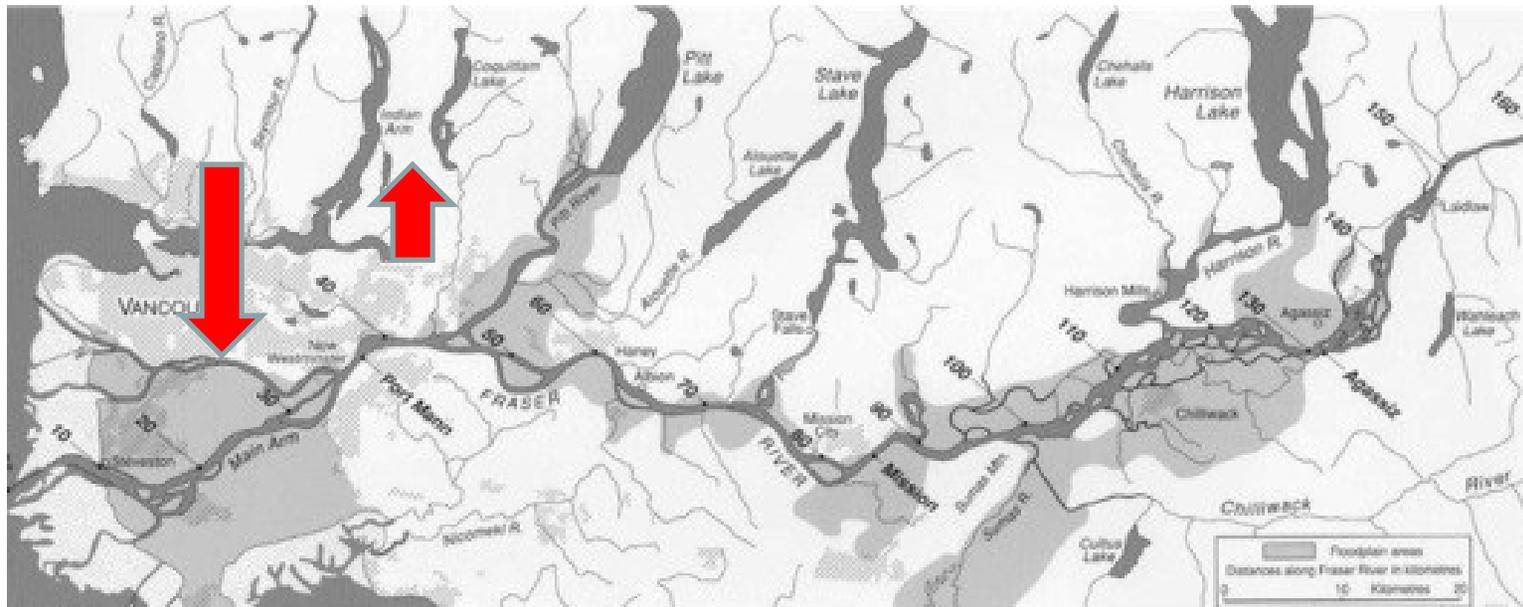




Fraser River Egg and Larval Survey

- Conducted by DFO in lower Fraser River since 1995
- Eggs and larvae are enumerated by set
- SSB was derived by applying daily river flow data (m^3/sec) and relative fecundity to measured egg and larval densities using a 1:1 spawner, sex ratio assumption

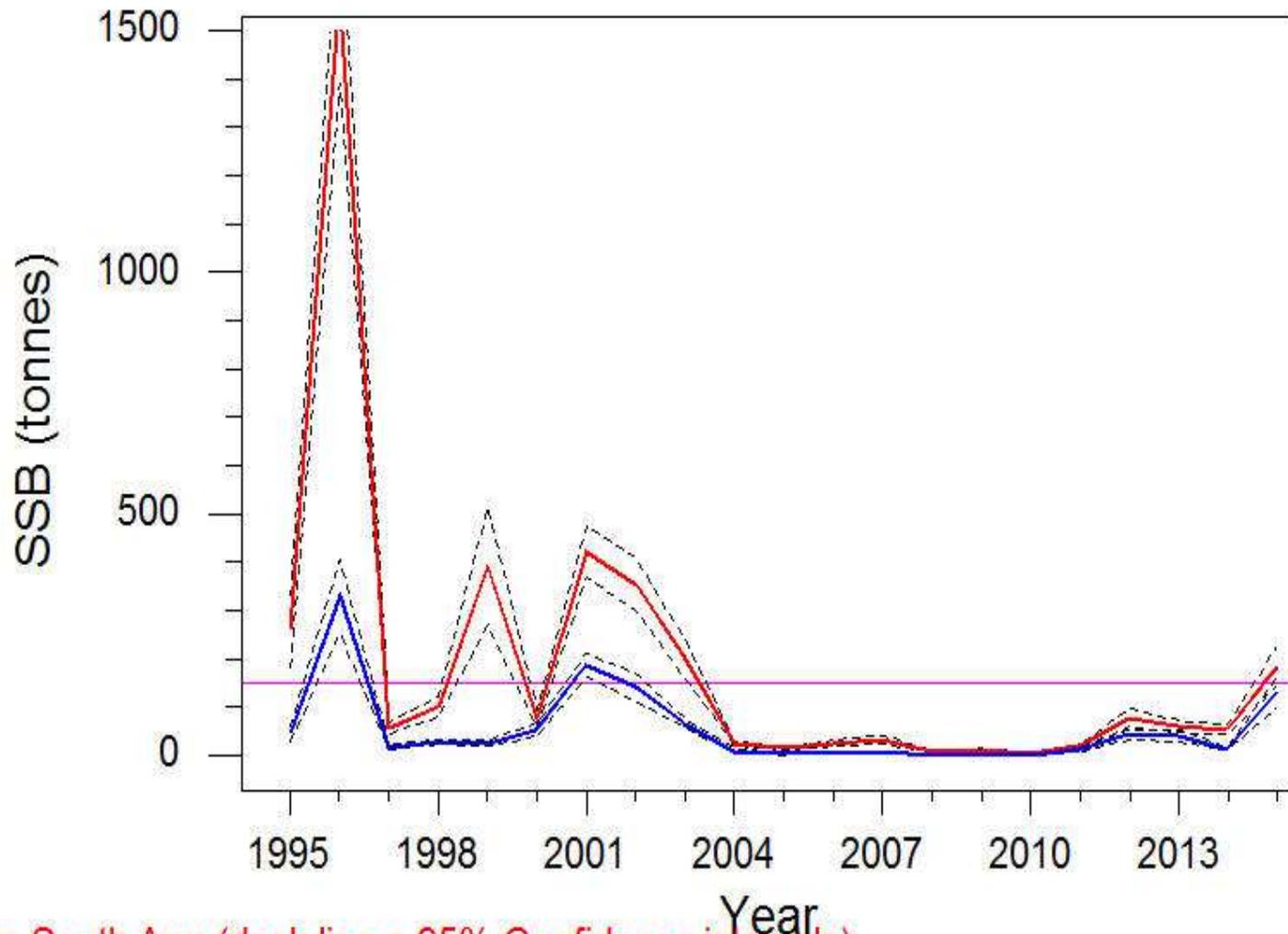




- Several hundred samples collected twice weekly over 7 week period
- Bongo nets with flow meters measure water volume
- Daily Fraser River discharge data was measured by the [Water Survey of Canada](#) at Hope, B.C



Fraser River Eulachon Spawners (with 150t action level)

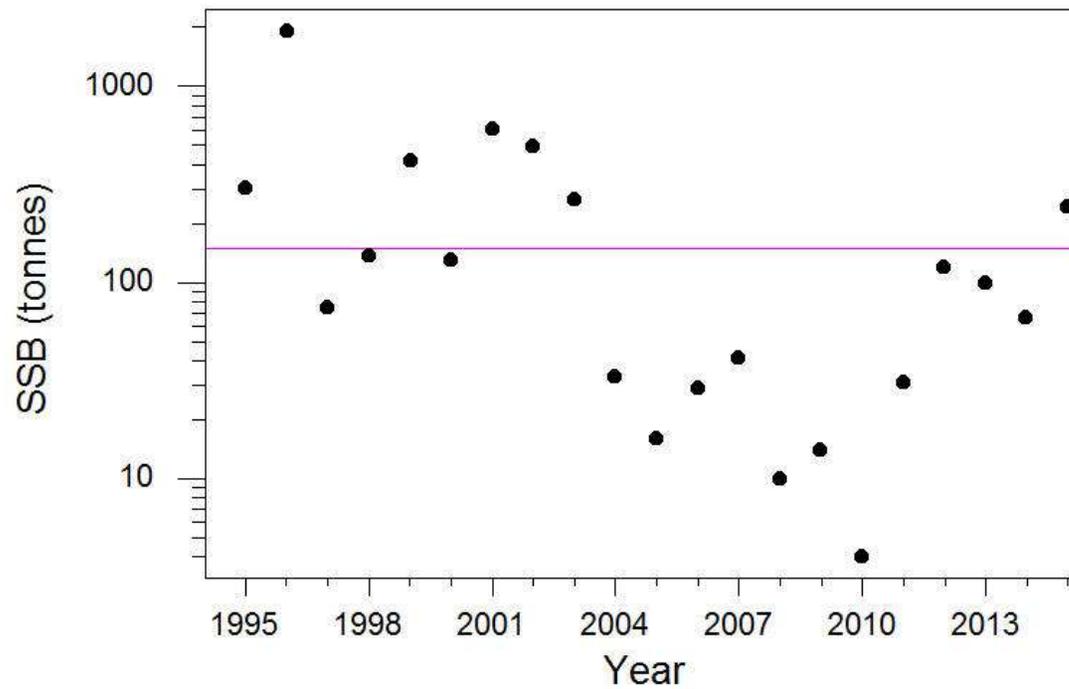


Red = South Arm (dash line = 95% Confidence intervals)

Blue = North Arm (dash line = 95% Confidence intervals)

Fraser River Egg and Larval Survey

Fraser River Eulachon Spawning Stock Biomass (SSB)

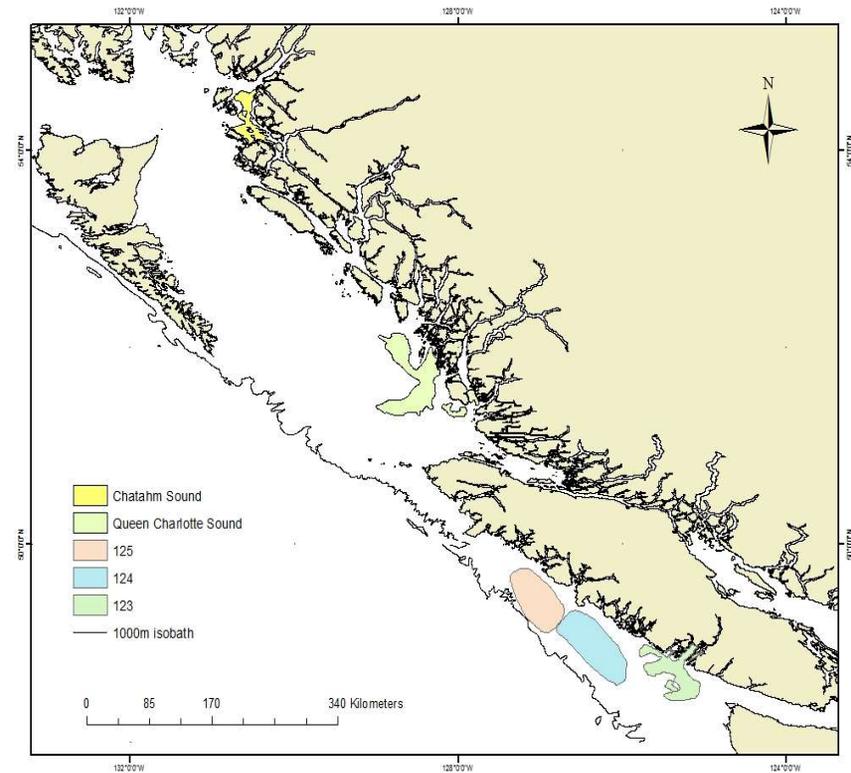


Note: Log SSB scale. Violet line=150t action level.

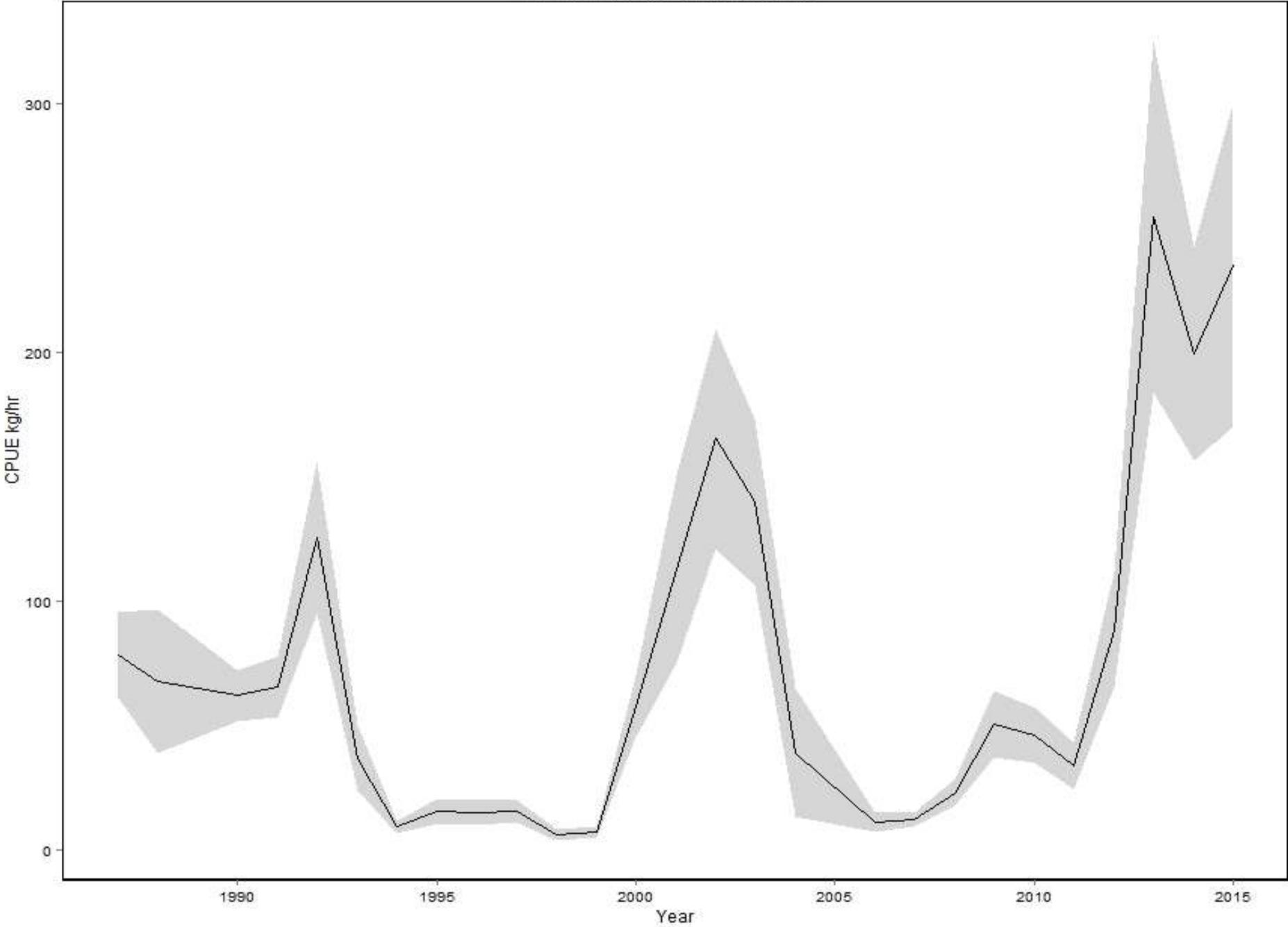
Estimated SSB Index for 2015:
317 tonnes

Small Mesh Multi Species Survey

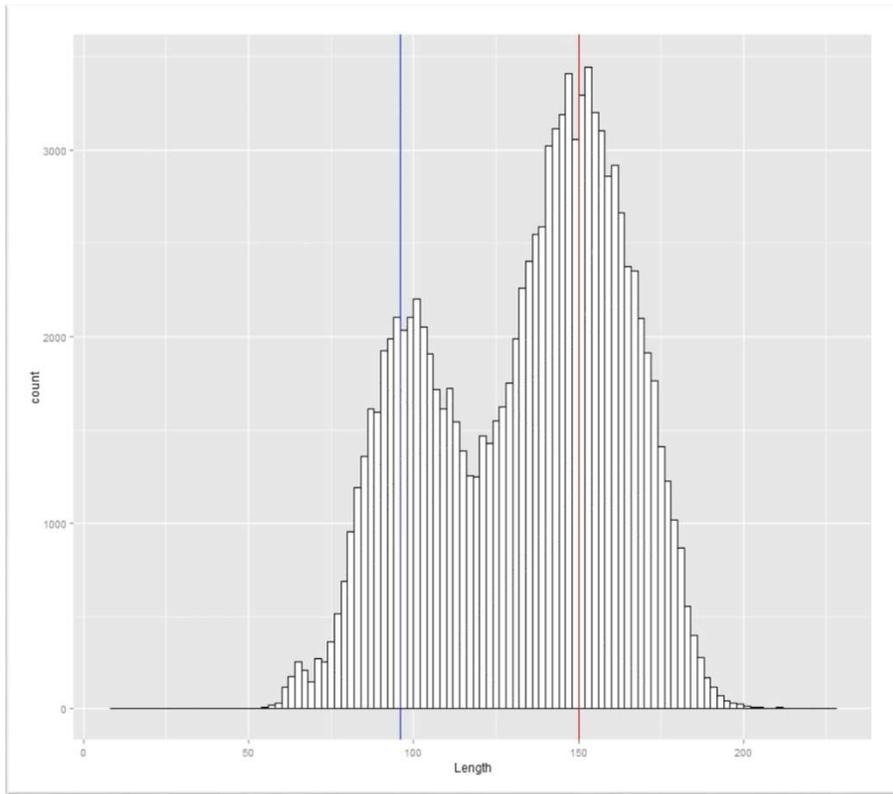
- Three areas of WCVI & Queen Charlotte Sound
- CCG W.E. Ricker
- Survey conducted in May
- Fixed station survey design
- Primary goal is to inform shrimp stock assessment



Mean WCVI CPUE and 95% CI

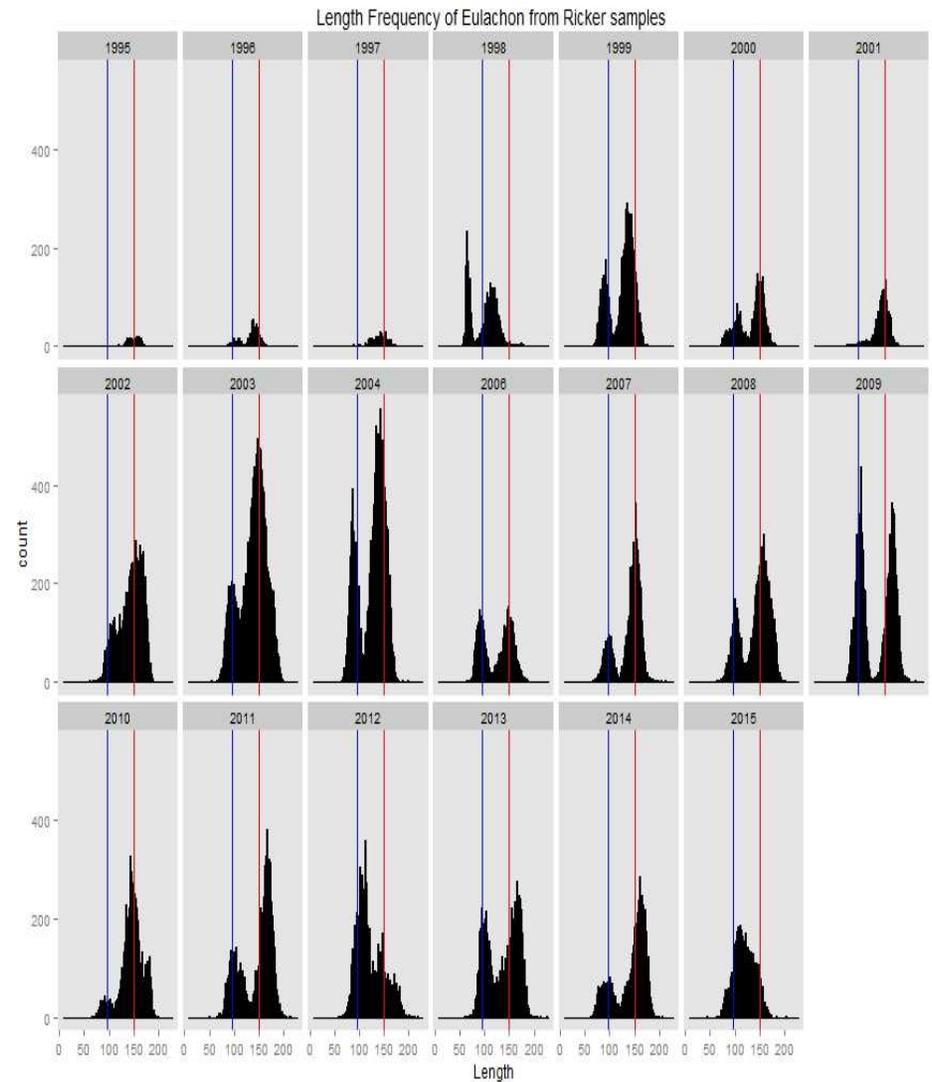


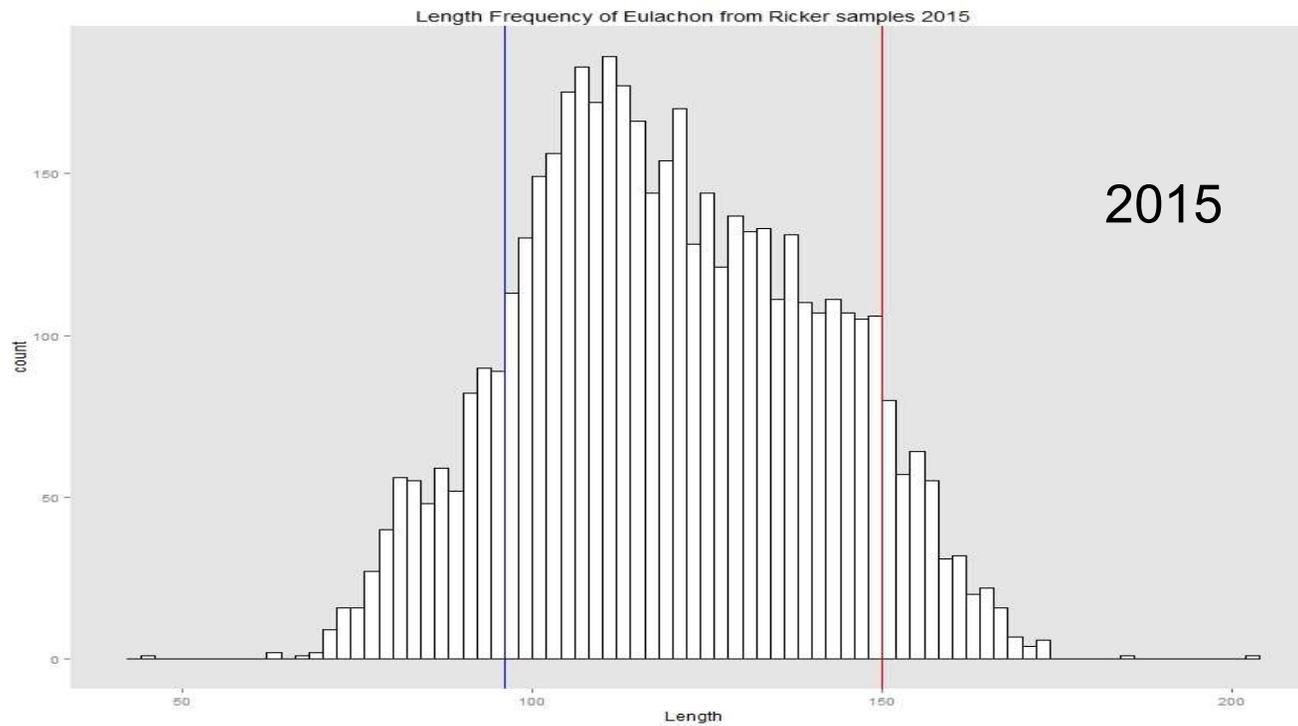
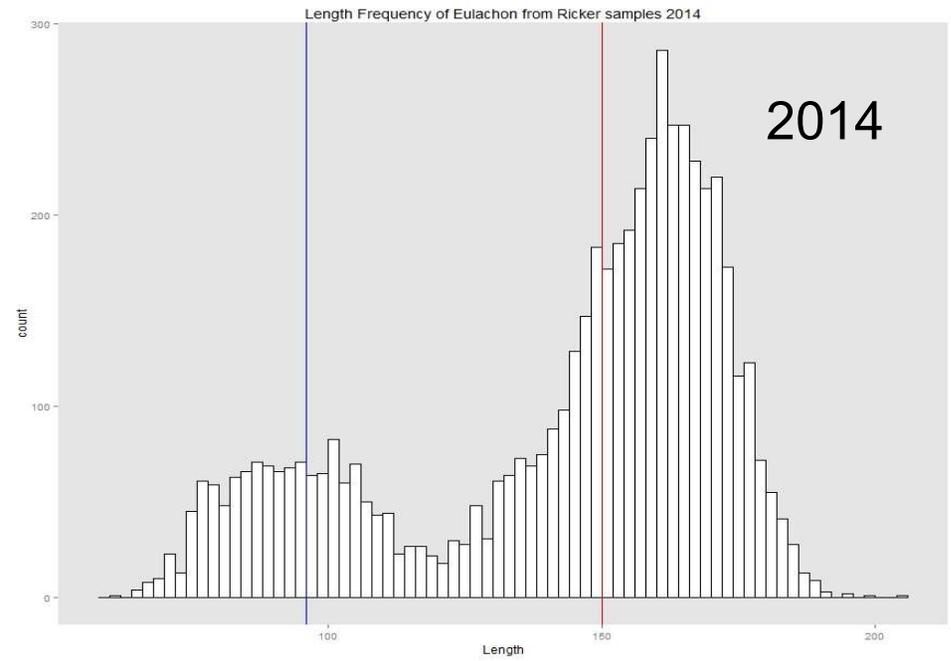
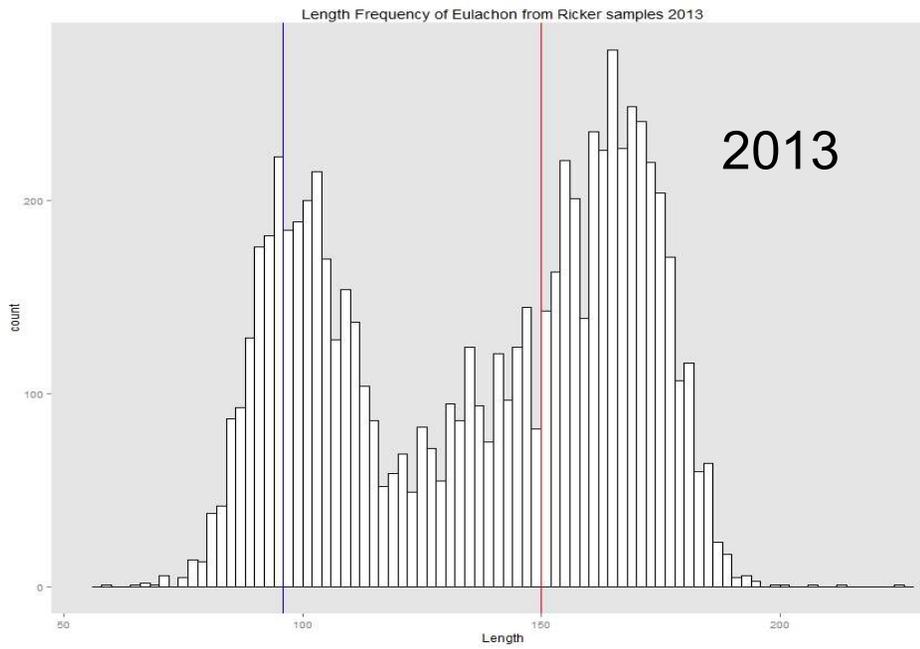
Length Frequencies



Length frequencies from offshore samples binned across all areas.

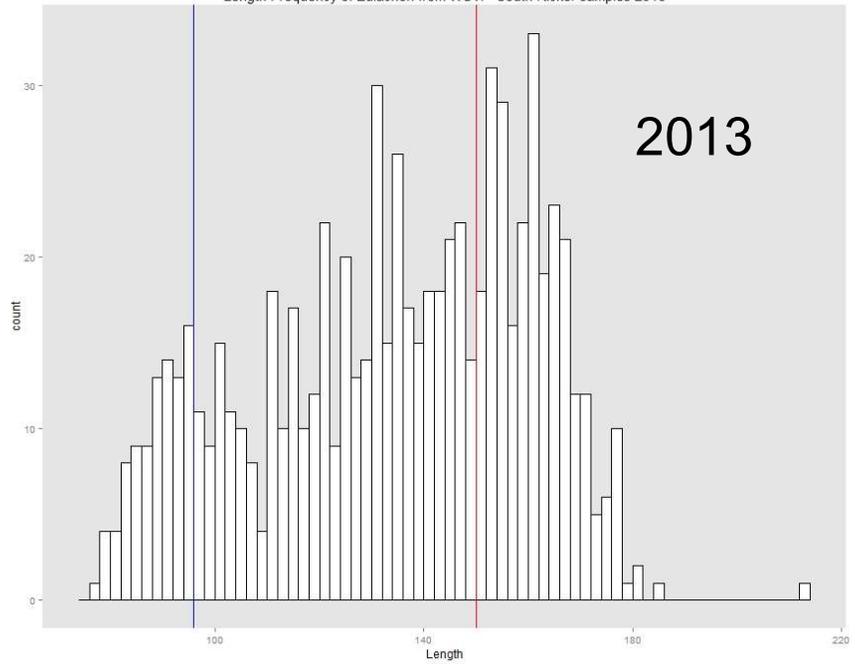
Blue and red line are approximate modal means



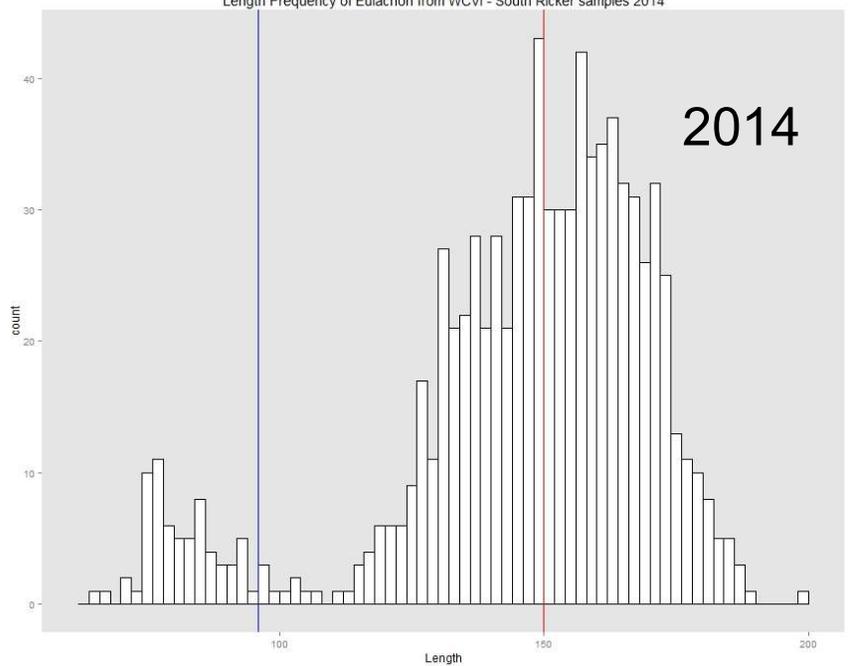


Length
Frequency
from WCVI
survey

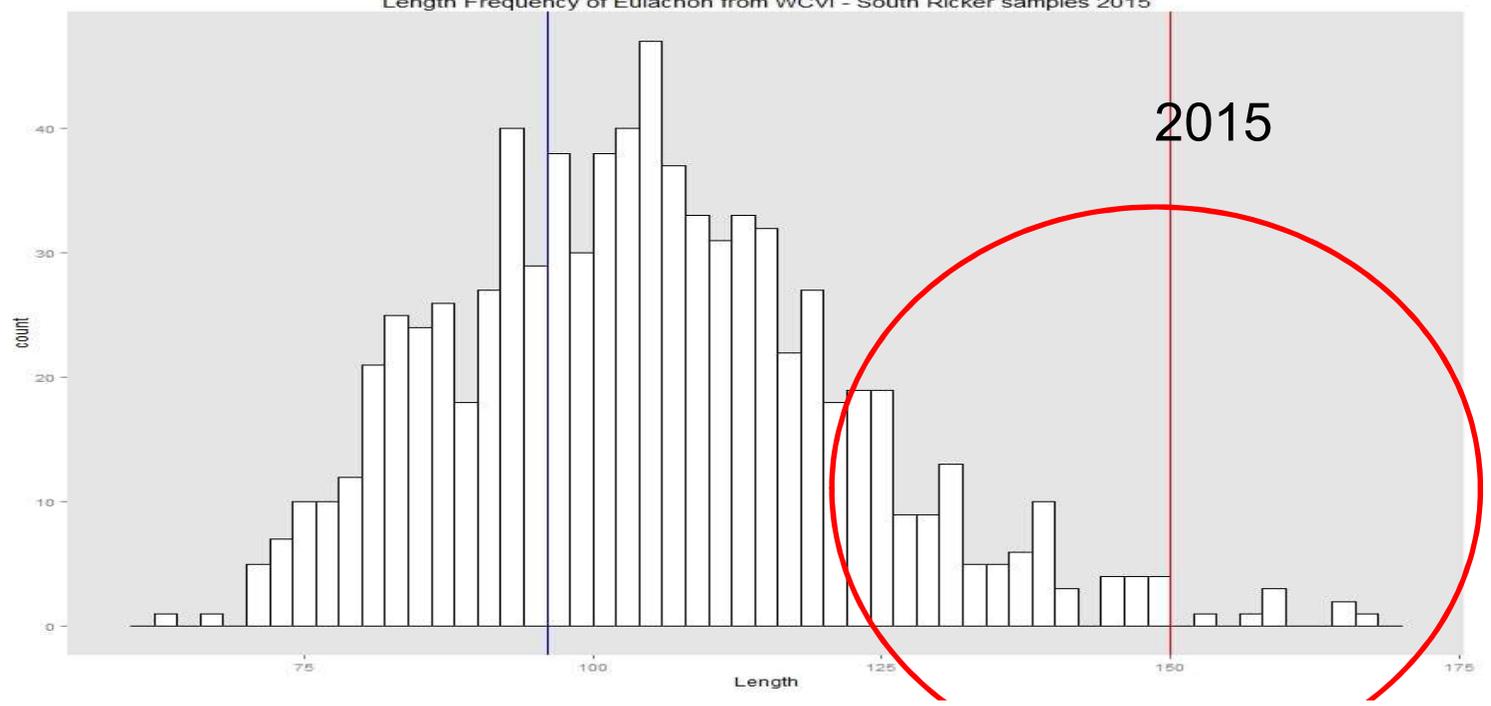
Length Frequency of Eulachon from WCVI - South Ricker samples 2013



Length Frequency of Eulachon from WCVI - South Ricker samples 2014



Length Frequency of Eulachon from WCVI - South Ricker samples 2015



LF for southern portion of WCVI survey

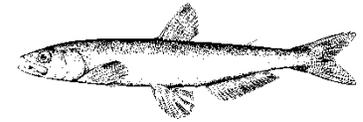
GENETICS

- 14 microsatellites for population identification.
- Results re-ran from 2012 with updated baseline data and correction of location assignments

		Estimate percentage by DU								
Region	Year	N	Nass-Skeena	SD	Central	SD	Fraser	SD	Columbia	SD
North	2002	50	39.3	26.9	58.3	27.1	1	3	1.1	3.4
	2003	49	40.2	23	50.2	21.8	8.7	9.7	0.9	3.1
	average		39.8		54.3		4.9		1	
Central	2002	149	76.8	11.4	22.2	11.4	0.4	1.3	0.7	1.8
	2006	50	53.8	18.4	27.8	20.7	10.5	12.3	7.9	9.6
	2007	184	44.1	11.5	35.0	11.6	19.2	6.4	1.7	3.2
	2008	441	27.9	7.3	20.3	7.7	20.4	5.1	31.4	5.8
	2009	434	17.7	6.3	9.0	5.6	38.9	6.0	34.4	6.4
	2010	195	18.7	8.3	12.1	7.8	35.2	8.6	34.0	9.0
	2011	285	46.5	10.6	28.4	10.6	13.3	4.5	11.8	4.5
	2012	204	68	11.6	28.7	10.7	0.9	2.3	2.4	3.7
	2013	239	15.9	7.4	5.3	5.6	28.9	8.0	49.9	8.8
	average			41.0		21.0		18.6		19.4
WCVI	2002	218	1.5	3.2	1	1.6	29.2	7.4	68.3	7.5
	2006	50	4.1	6.1	6.1	7	31.6	18.1	58.3	17.7
	2007	254	7.2	4.5	.7	1.3	7.2	4.5	69.2	7.8
	2008	657	0.6	0.9	0.6	0.9	40.3	4.4	58.6	4.3
	2009	575	1.6	2.1	0.8	1.2	18.9	5.0	78.8	4.9
	2010	180	2.2	3.0	1.9	2.6	39.9	10.3	56.0	10.3
	2011	410	0.5	0.8	0.6	1.0	22.4	5.3	76.6	5.4
	2012	509	1.5	1.9	0.9	1.3	29.5	5.2	68.1	5.4
	2013	498	0.5	0.8	0.4	0.7	26.8	6.0	72.3	6.1
	2014	570	1.6	1.9	1.5	1.7	34.8	6.2	62.2	6.2
average			2.1		1.5		28.1		66.8	

Conservation Actions to Date

- Shrimp Trawl bycatch reductions
 - Bycatch reduction devices (BRDs)
 - Eulachon Action Levels
 - Closure in Queen Charlotte Sound
- Fisheries closures
 - Recreational fisheries (all tidal waters)
 - Commercial and test fisheries (Fraser River)
- Dredging suspension during spawning (Fraser)
- Reduction in FSC fisheries
- Research initiatives
- HSP/AFSAR funded community projects



Future directions

- Continue egg and larval survey in Fraser
- Continue WCVI offshore multi-species survey
- Re-establish QCSound multi-species survey
- Re-establish Eulachon data collection on Chatham Sound
- Continue to support non-DFO led initiatives
 - Egg and larval survey in Nass, Skeena and Bella Coola rivers
 - Collection of ATK by various First Nations
 - Research by independent investigators
 - Listing consultation under SARA



For further information

DFO -SARA

- http://www.dfo-mpo.gc.ca/species-especies/home_e.asp

DFO – WAVES

- <http://waves-vagues.dfo-mpo.gc.ca/waves-vagues/>

SARA public registry

- http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=645

Province of BC

- http://www.speciesatrisk.bc.ca/index.asp?type=single§ion=Search_by_Species&sid=40&id=157

COSEWIC

- <http://www.cosewic.gc.ca>

Environment Canada

- http://www.speciesatrisk.gc.ca/default_e.cfm

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