

Steelhead Stock Status Review British Columbia



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BC Ministry of Forests, Lands and Natural Resource Operations**

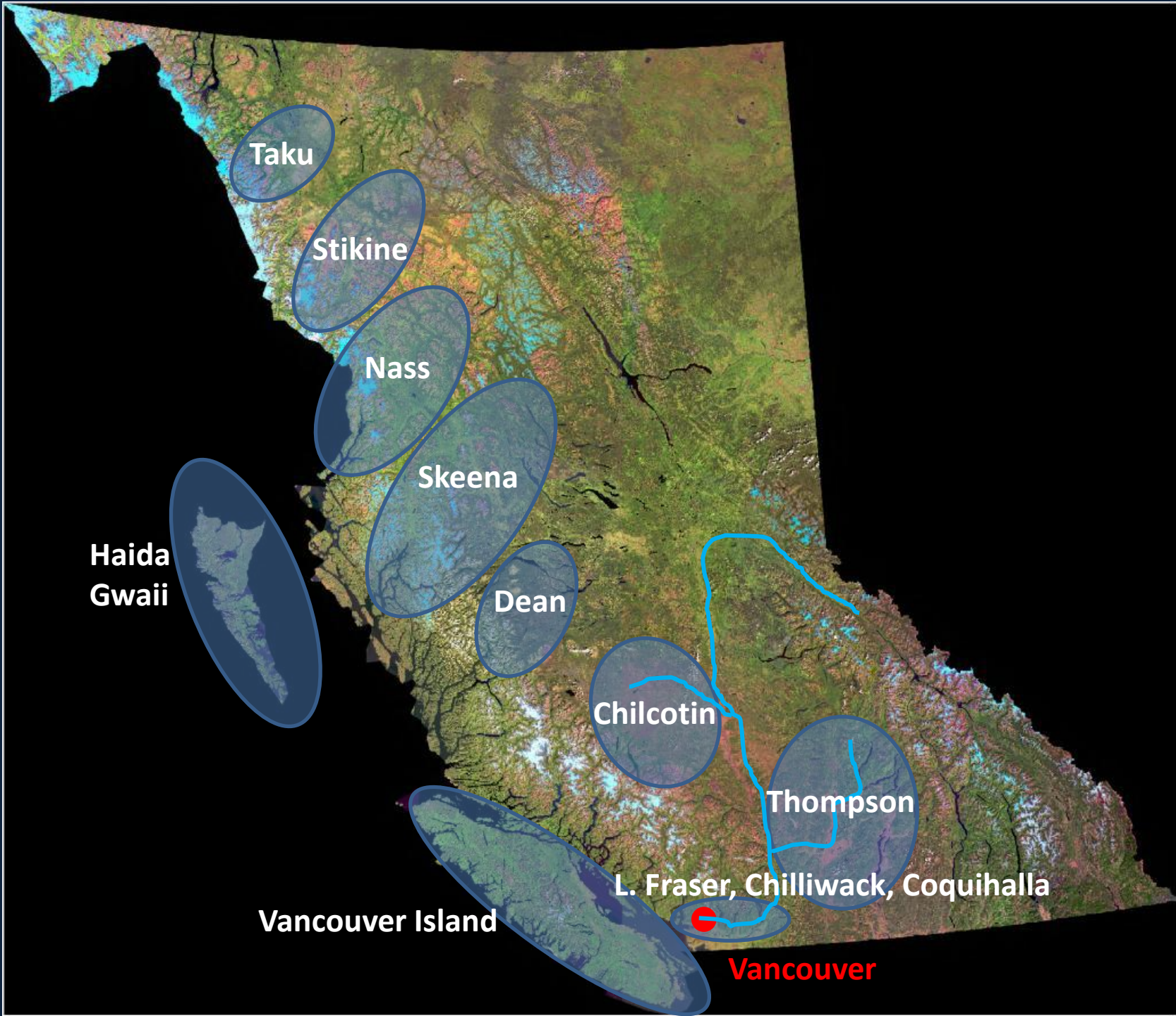
Overview

1. **Stocks and Ecotypes in BC**
2. **Hatchery Augmentation**
3. **Stock Status - Regional Trends**
4. **Recreational Fishery – Regional Trends**
5. **BC Policy, Management and Challenges**

Stocks and Ecotypes in BC

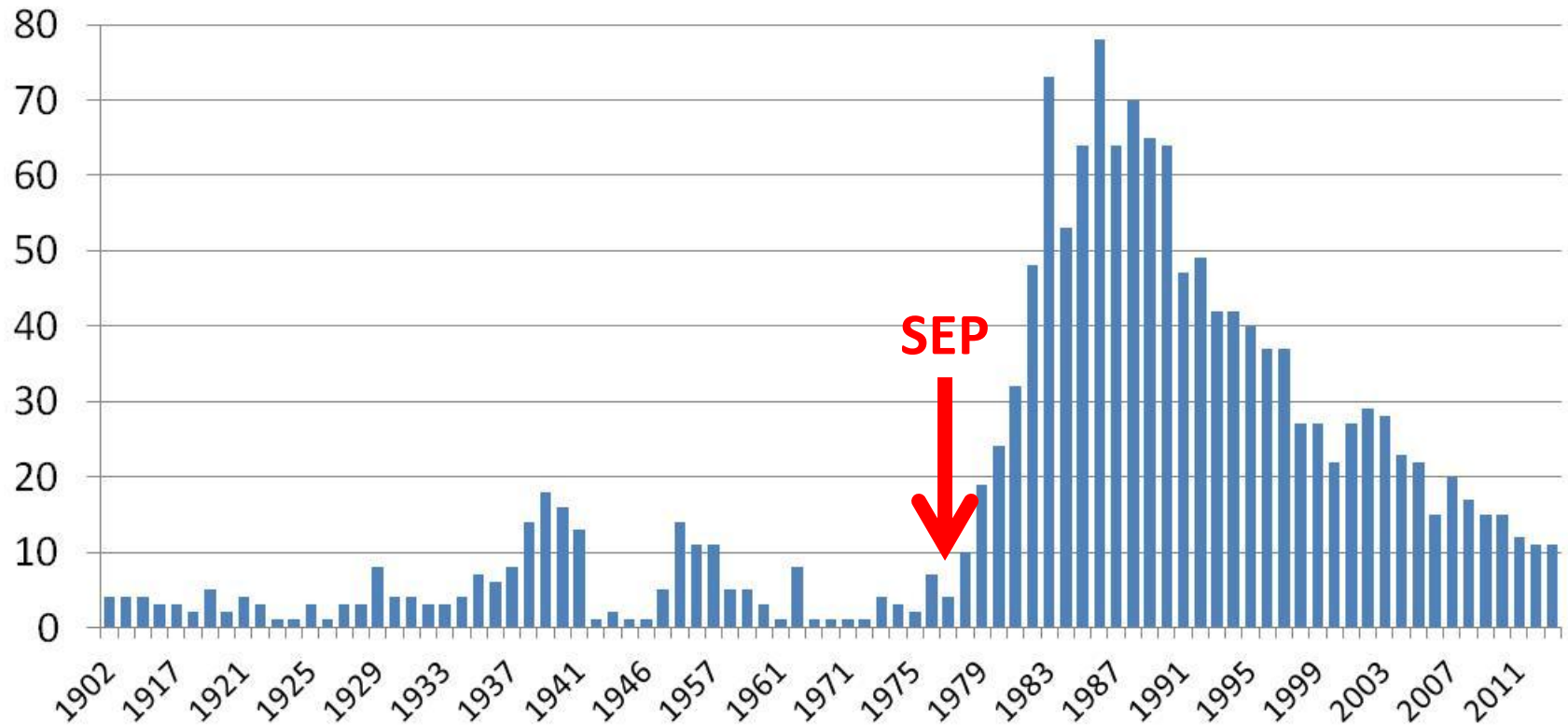
Stocks and Ecotypes, CU's

Ecotype	Major systems	Number of stocks
Coastal winter (Oct - June)	L. Fraser, Van Is, coastal Skeena, Haida Gwaii, Nass, Iskut, lower Stikine and Taku	~280-300+
Coastal summer (June - September)	Lower Mainland, L. Fraser, Van Is, Bella Coola, Dean, North Coast	~30-40
Interior summer (June - November)	Mid-Fraser, Upper Nass, Upper Skeena, Stikine, Taku	~70-80 n=430+



Hatchery Augmentation

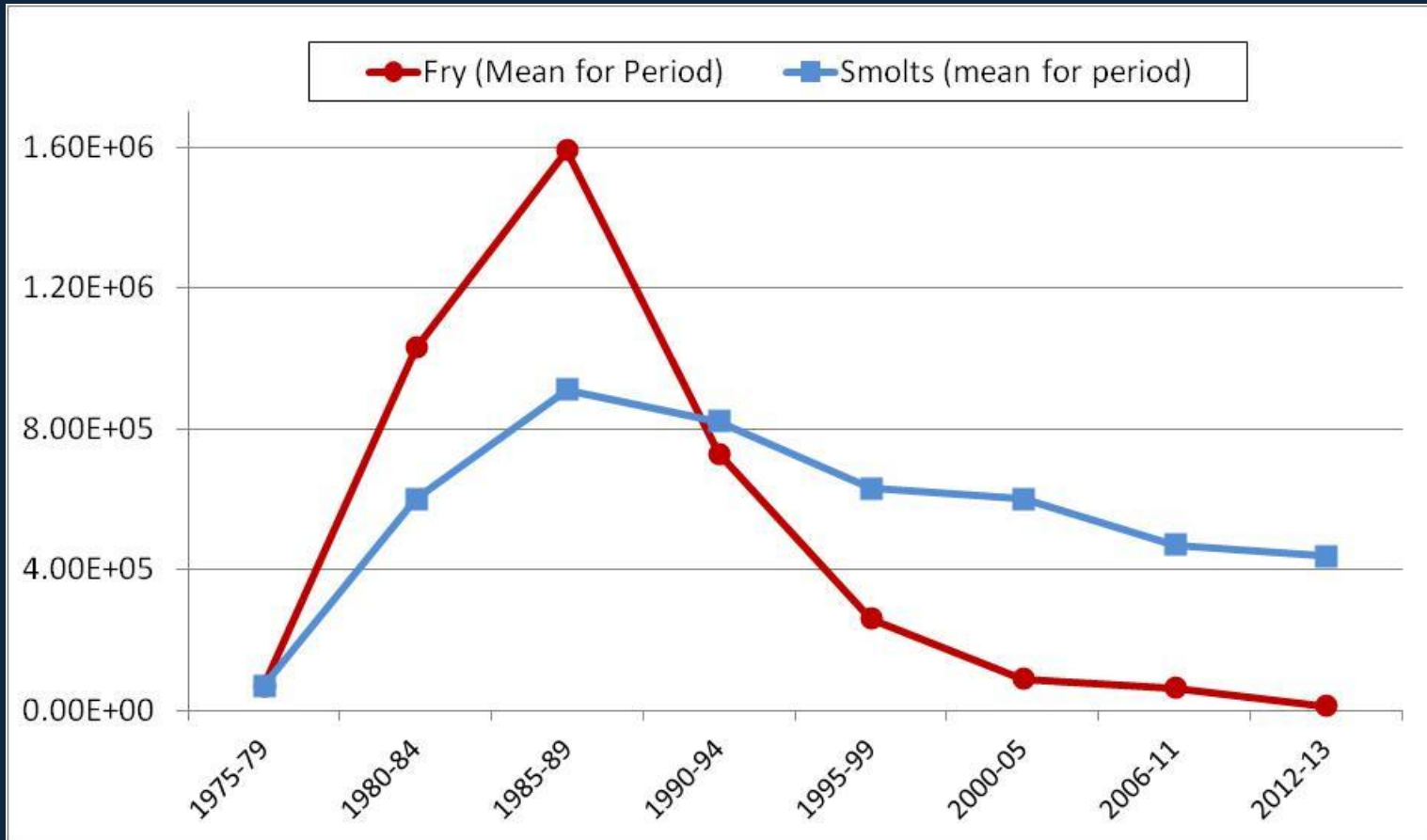
Number of BC Streams Stocked with Steelhead Juveniles - 1902 - 2013



Number of BC Streams Stocked with Steelhead Juveniles by Region – 1965-2013

Time Period	Van. Is.		Mainland		Thompson		Central Coast		Skeena		All	
	Fry	Smolt	Fry	Smolt	Fry	Smolt	Fry	Smolt	Fry	Smolt	Fry	Smolt
1965-74	1	3	2	2	0	0	0	0	0	0	3	5
1975-84	11	15	14	8	1	1	2	0	4	1	32	25
1985-94	19	17	18	19	1	1	3	0	8	1	49	38
1995-01	11	10	6	14	1	0	0	0	0	1	18	25
2002-05	8	5	2	8	0	0	0	0	0	1	10	14
2006-12	7	5	4	8	0	0	0	0	0	1	11	14
2013	0	3	1	8	0	0	0	0	0	1	1	12

BC Hatchery Steelhead Releases



Stock Status - Regional Trends

Abundance and Productivity

- Most BC stocks occur in small coastal watersheds $<300 \text{ km}^2$, typically support $<10,000$ smolts
- Coastal BC streams generally not naturally productive due to geology, high precipitation and gradient, in some cases declining salmon stocks
- Interior BC streams highly variable natural productivity, influenced by growth season and geology; south more productive, north limit of range considered very low (i.e. 4-5 years to grow a smolt)
- Aggregate abundance for BC $\sim 340,000$ wild steelhead

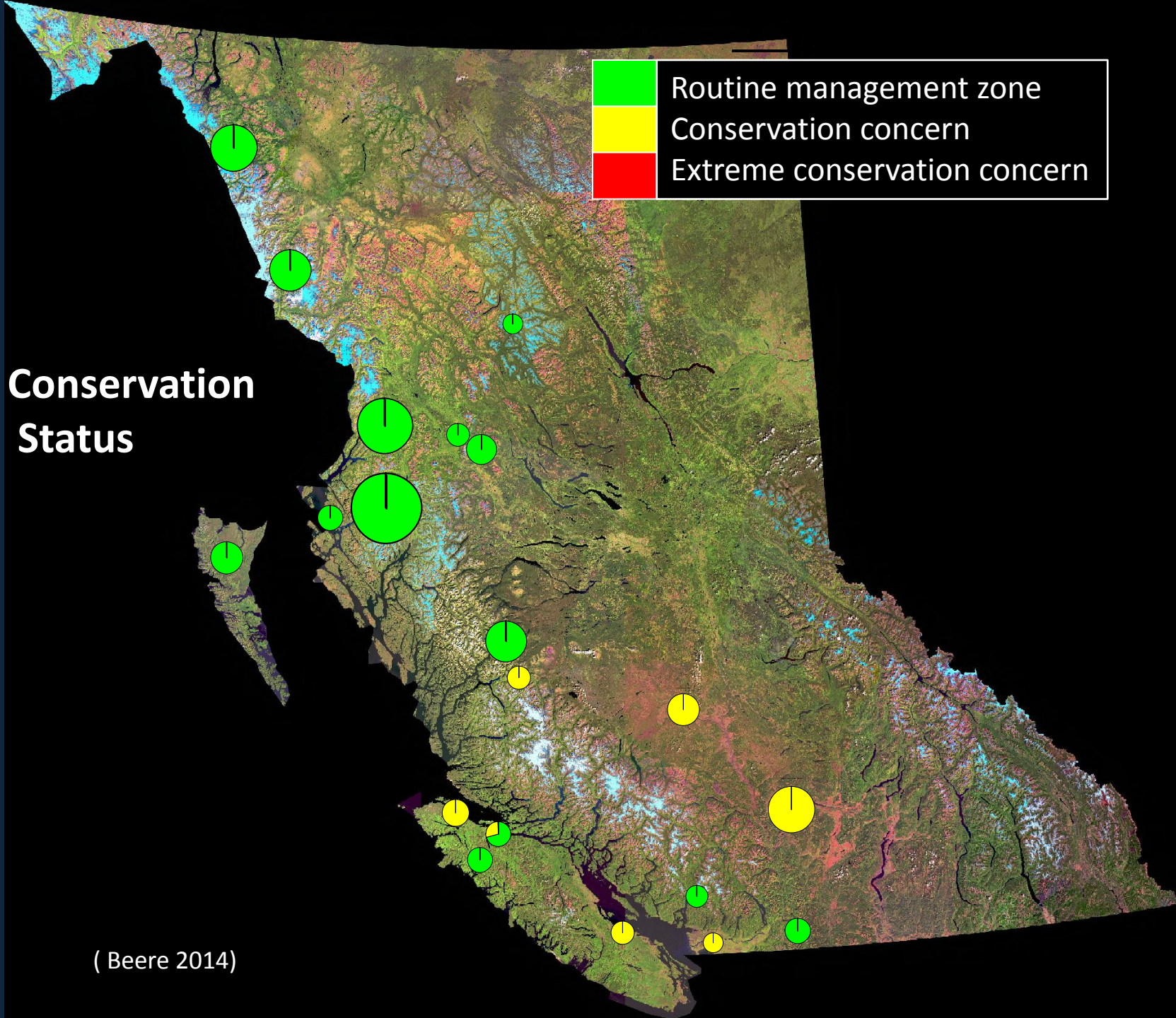
Skeena Steelhead Assessment Challenges



Assessment Methods:

- **Total adult counts (n=7): resistivity (4), weirs (2), sonar (1)**
- **Abundance indices (n≈30):**
 - **Adults**
 - **Gillnet test fisheries (2)**
 - **Fishwheels (1)**
 - **Snorkel surveys (10-20)**
 - **Aerial/boat counts (2)**
 - **Creel (1)**
 - **Steelhead Harvest Analysis (catch, effort)**
 - **Juveniles**
 - **Fry and parr sampling (often hydro-related)**

Conservation Status

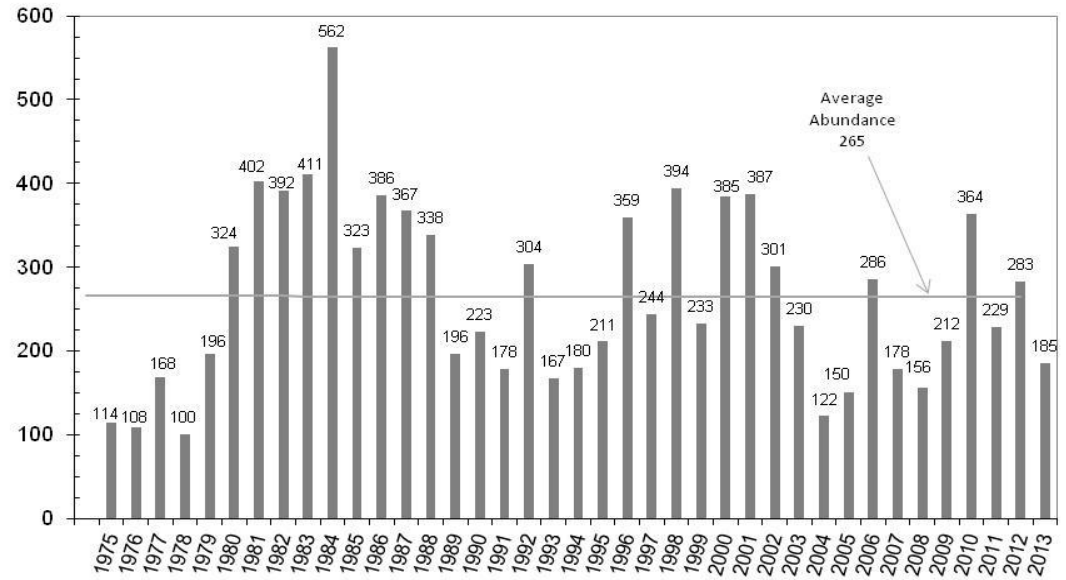


(Beere 2014)

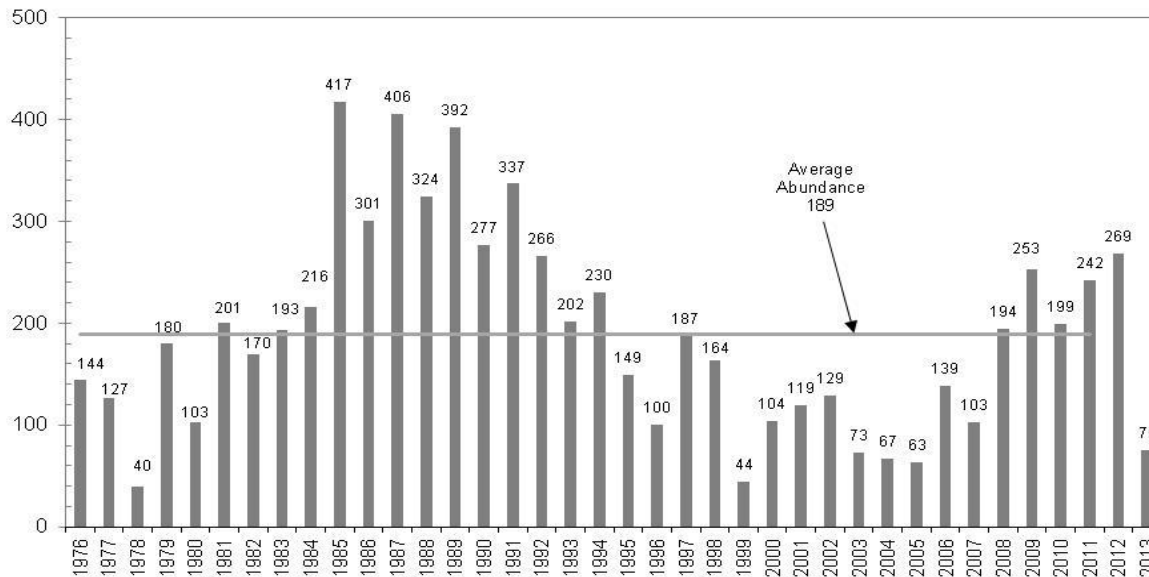
Vancouver Island

Coastal Summer Stocks

HEBER RIVER SUMMER STEELHEAD, 1975-2013
Snorkel Survey Observations - 8.5 km Falls to Mouth



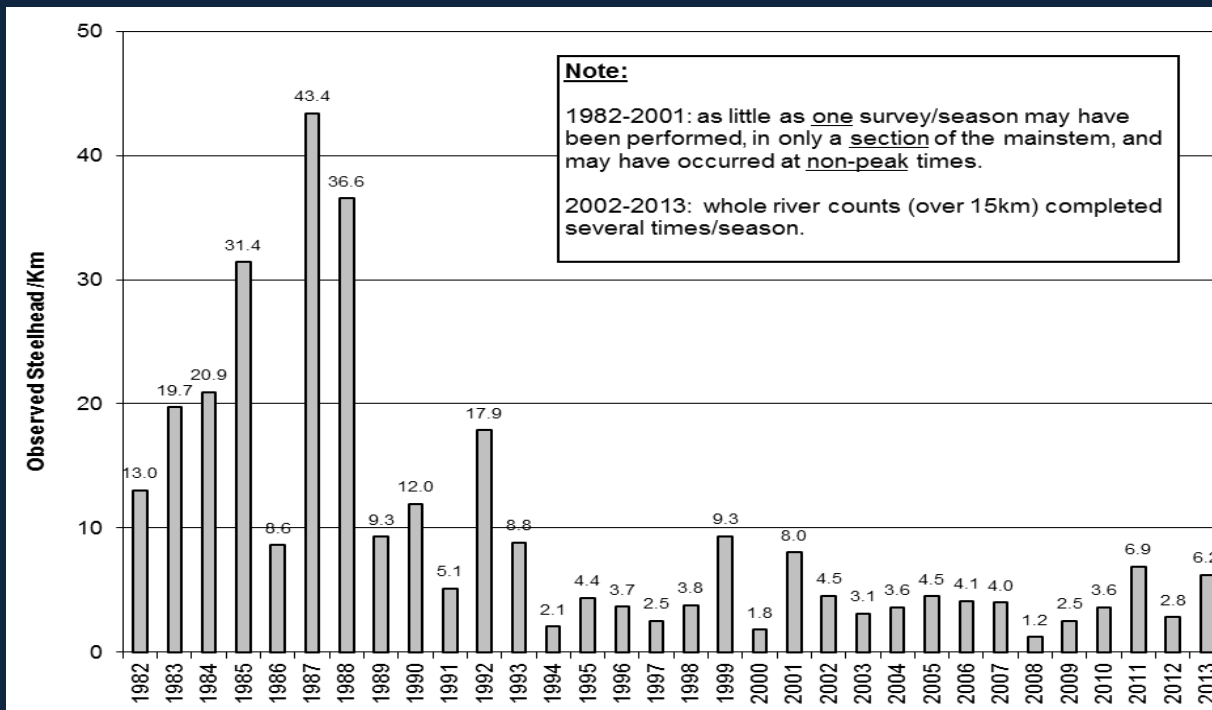
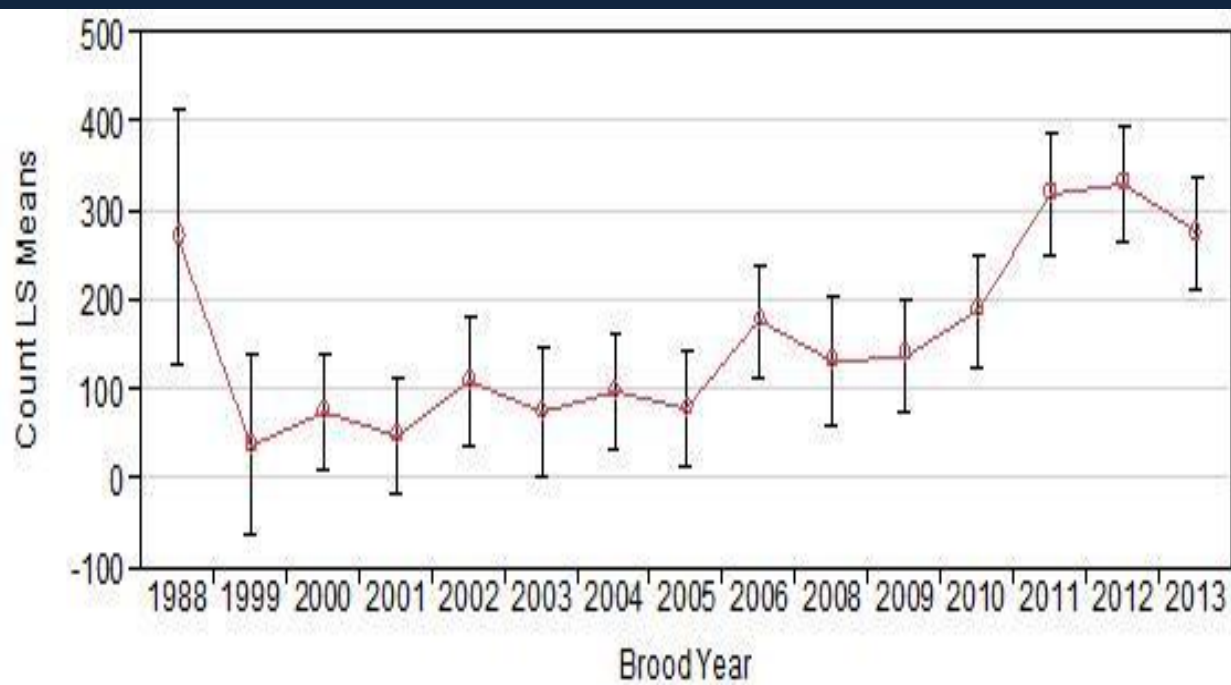
TSITIKA RIVER SUMMER STEELHEAD (1976-2013)
Snorkel survey observations, standard 9.2 km index



Vancouver Island

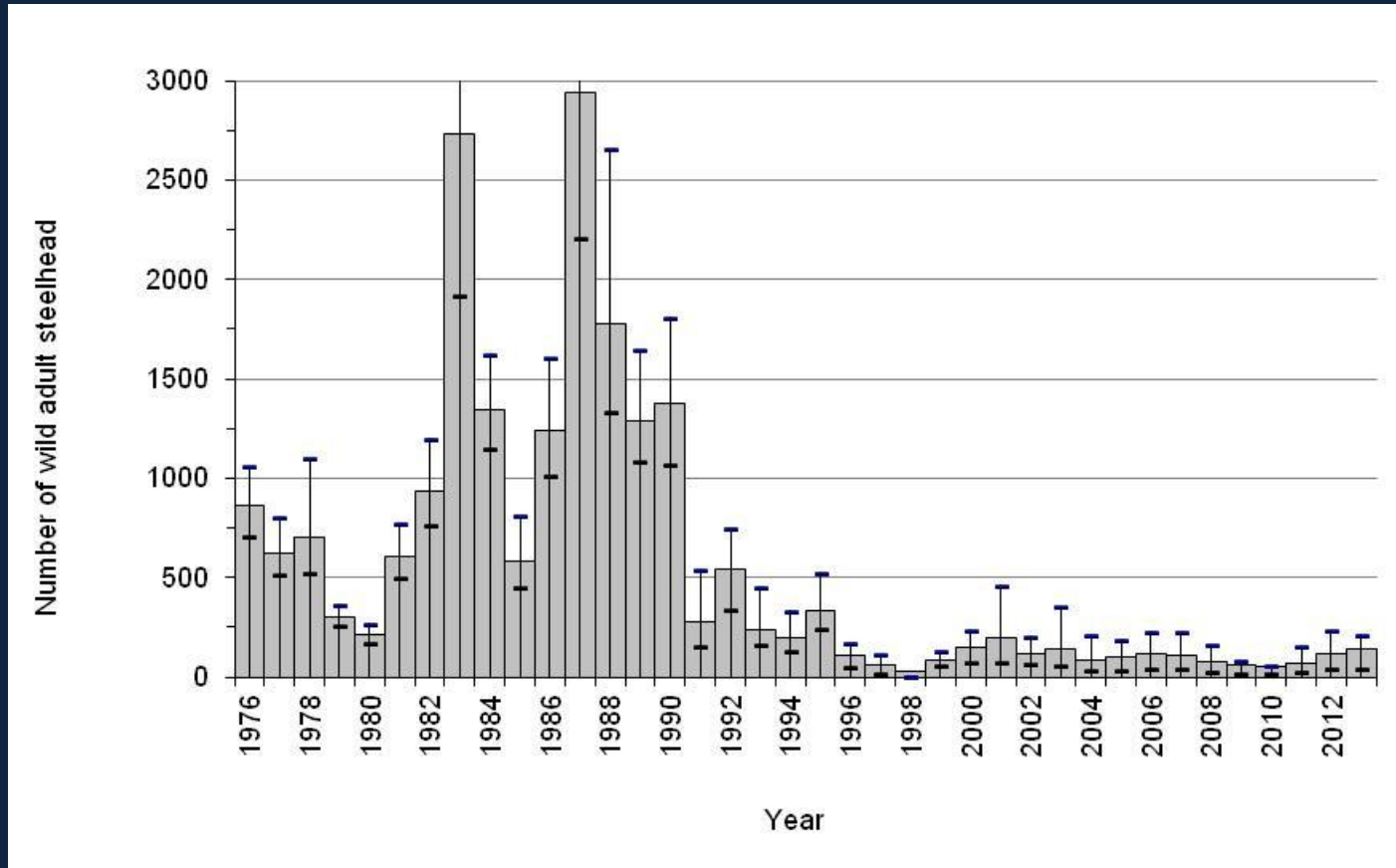
Cowichan

Englishman

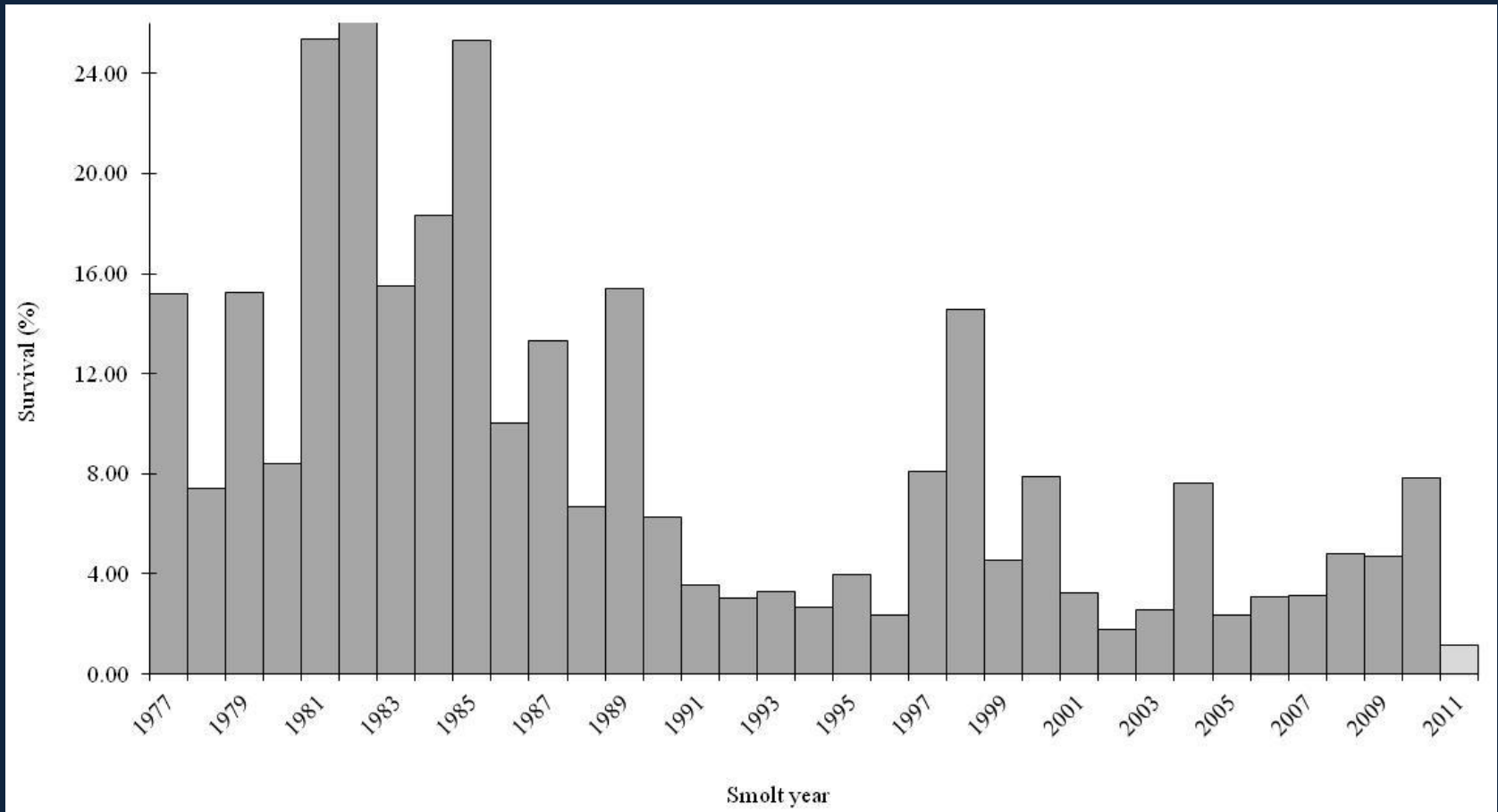


Coastal Winter Stocks

Keogh River Adult Abundance (Coastal Winter Stock)



Marine Survival Estimates for Steelhead Smolts by Year of Ocean Entry, Keogh River, BC 1977- 2011

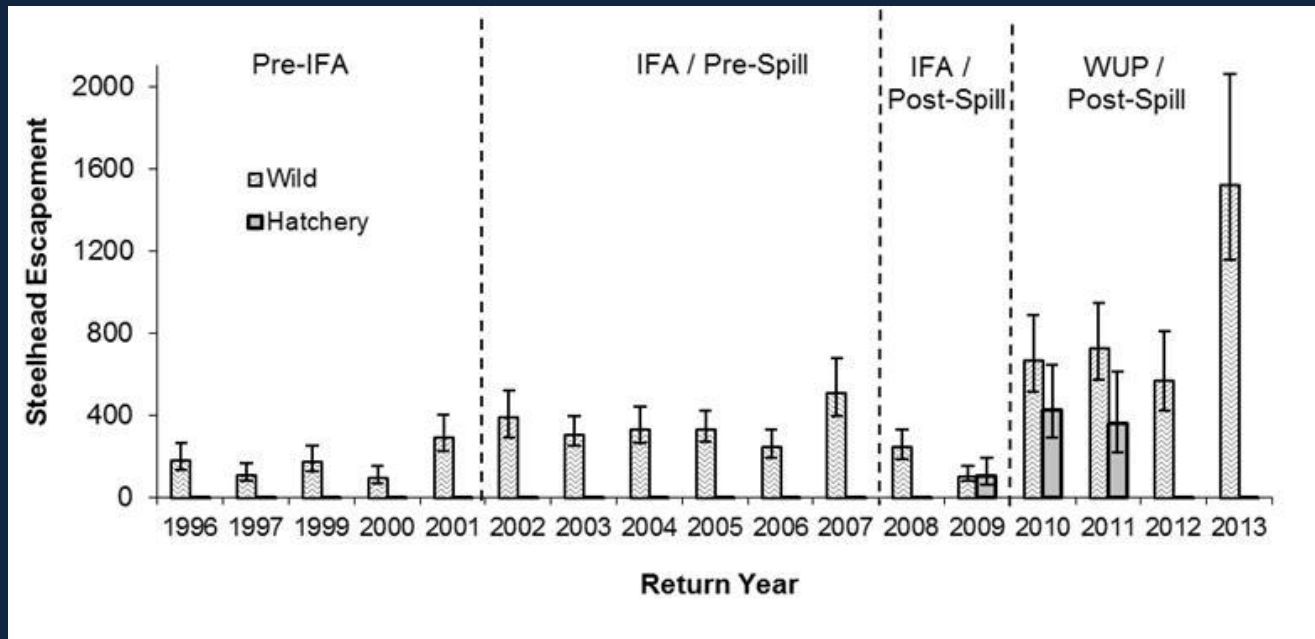
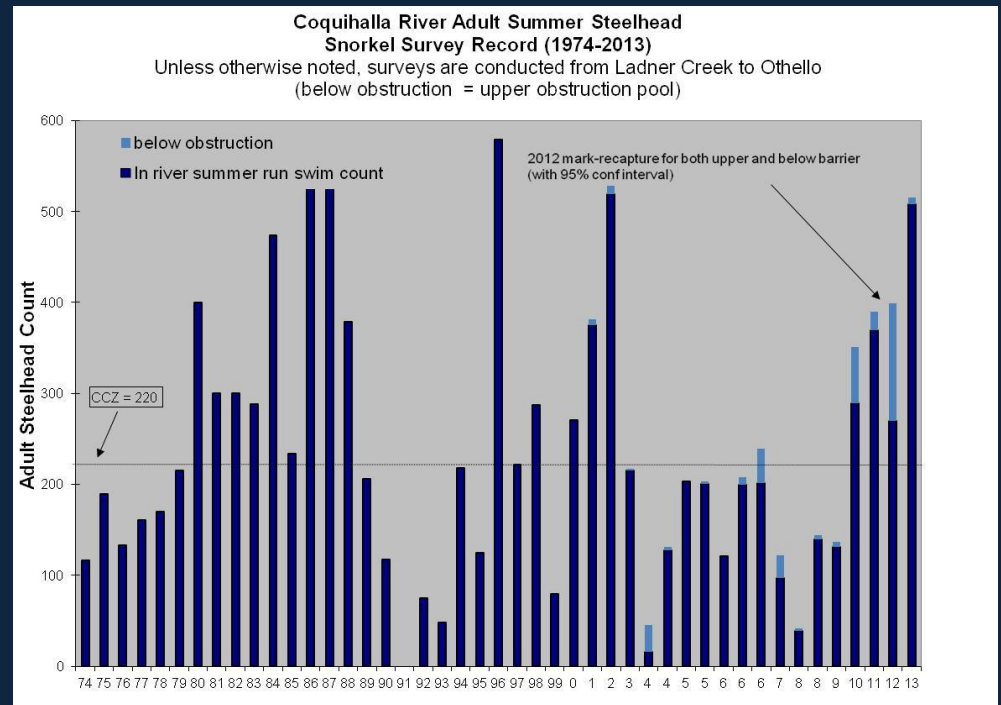


NB: Data for 2011 requires data from additional returns in 2014 for the complete estimate.

Lower Mainland

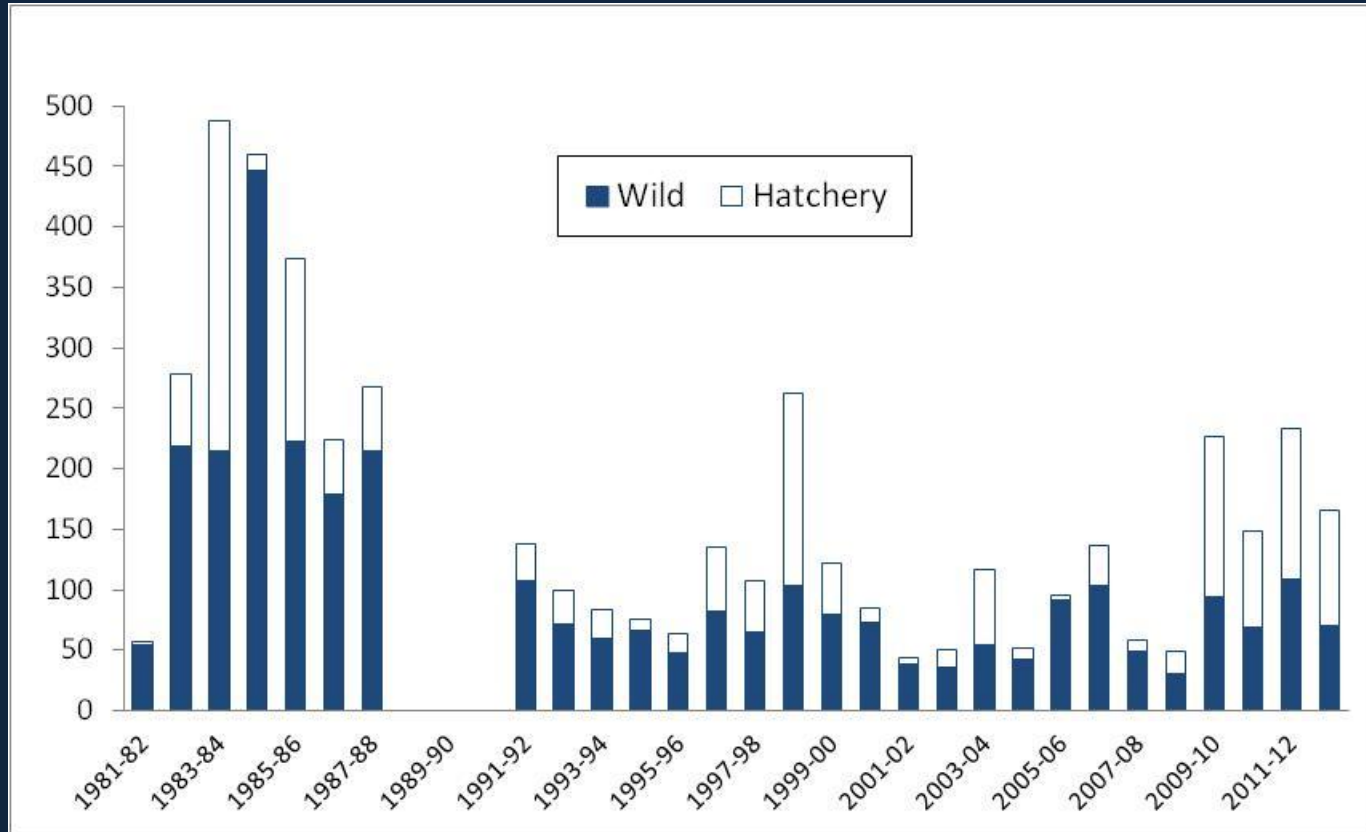
Coastal Summer Stock

Coastal Winter Stock



Lower Mainland

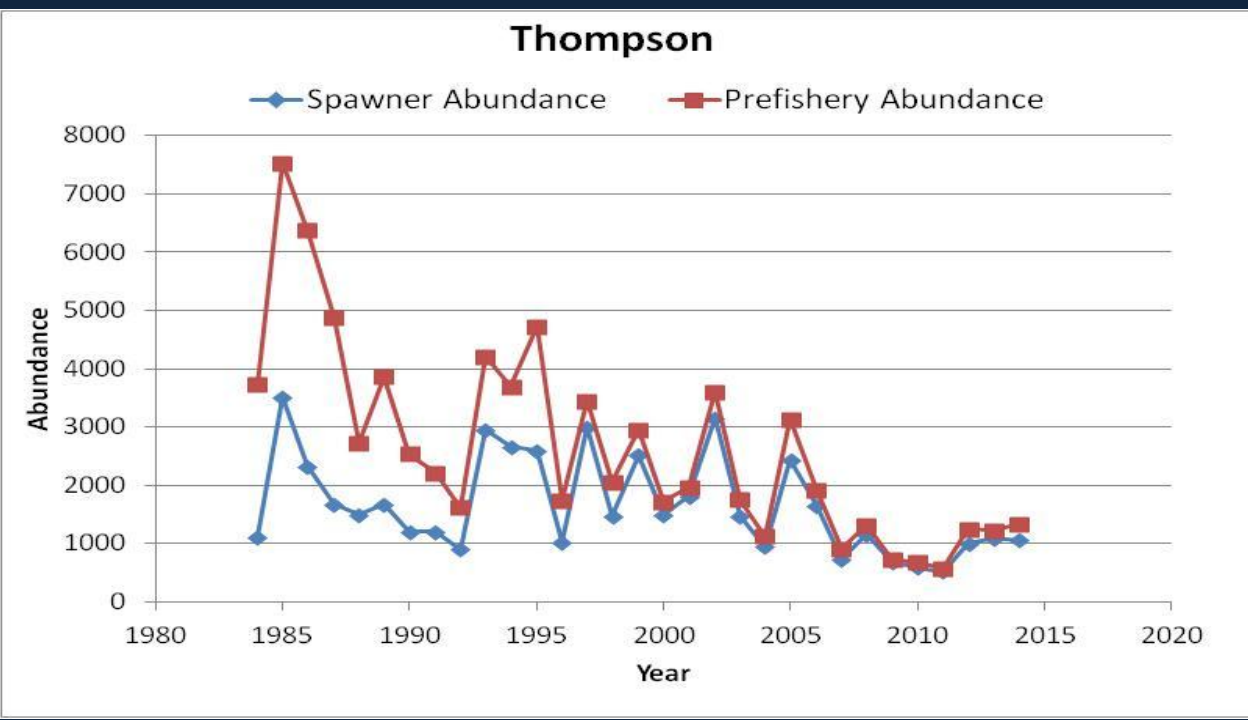
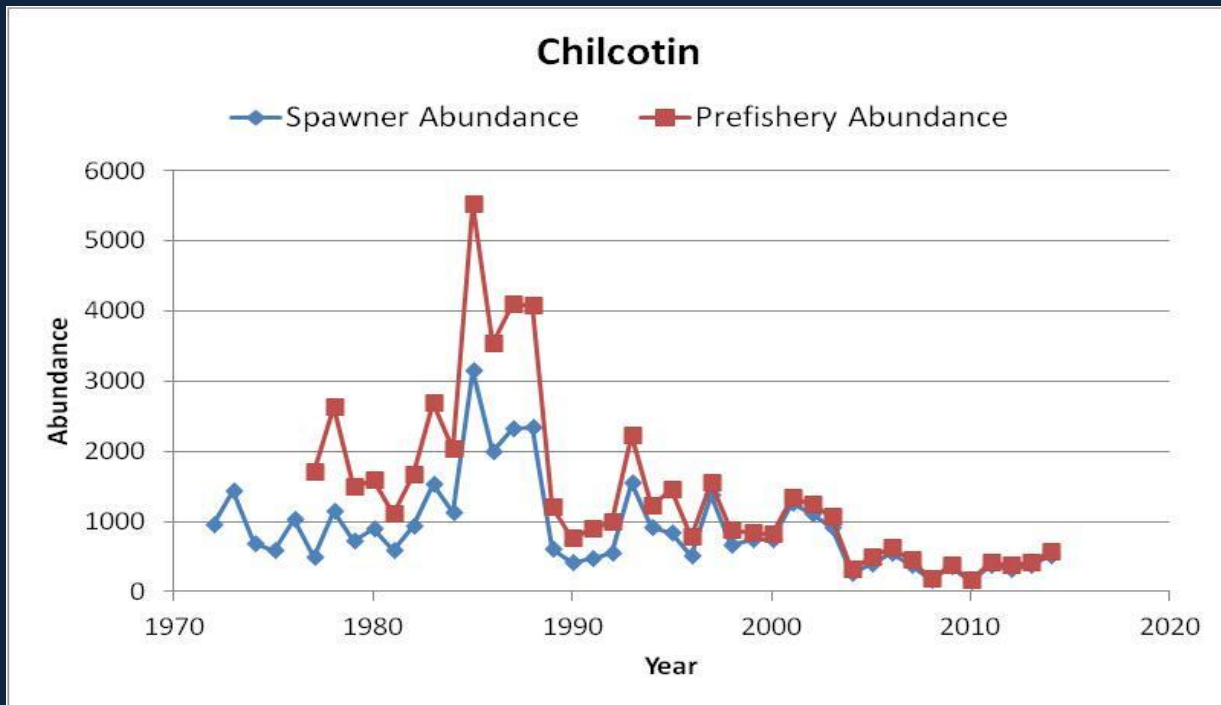
Little Campbell River Fence Adult Steelhead Count – 1981-2013



Coastal Winter Stock

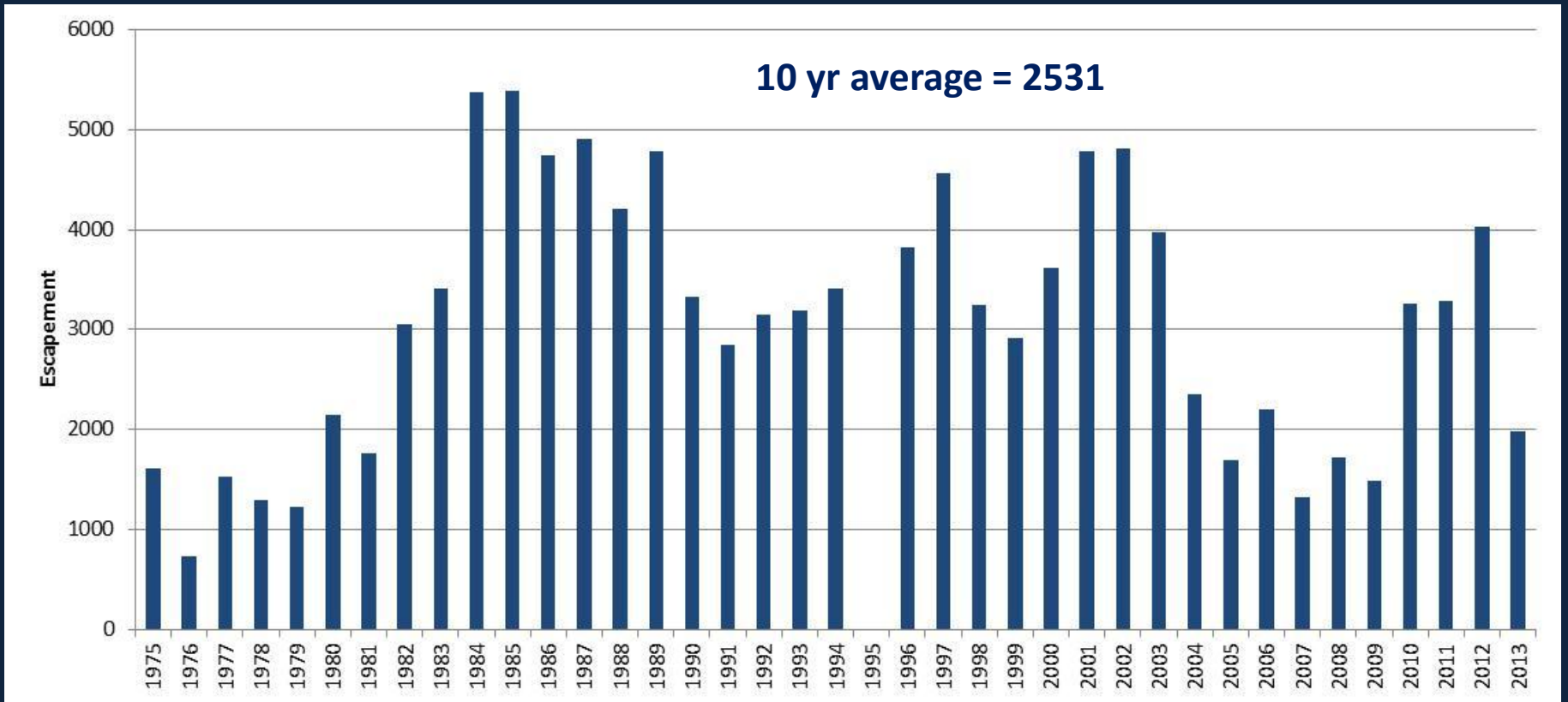
Thompson/ Interior Fraser

Interior Summer Stocks



Central Coast

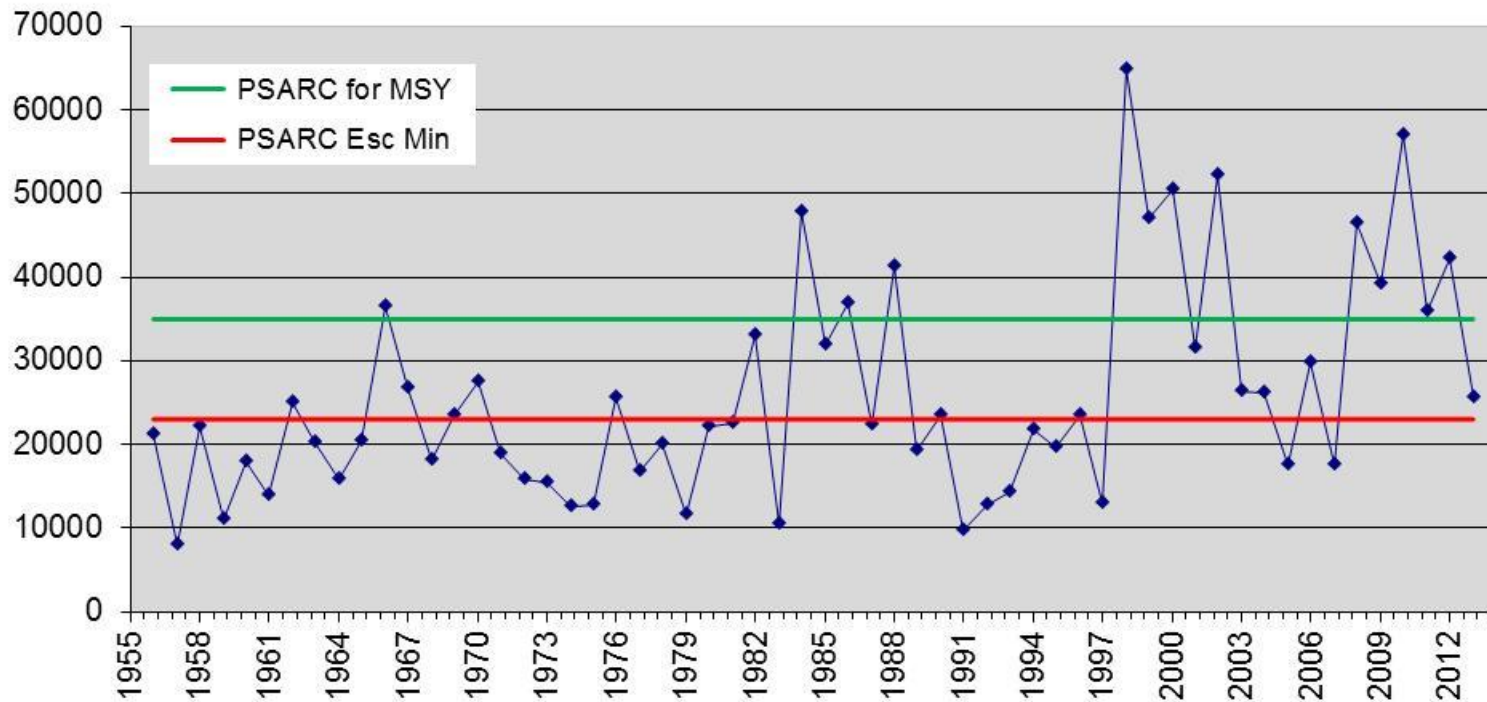
Dean River (Coastal Summer Stock)



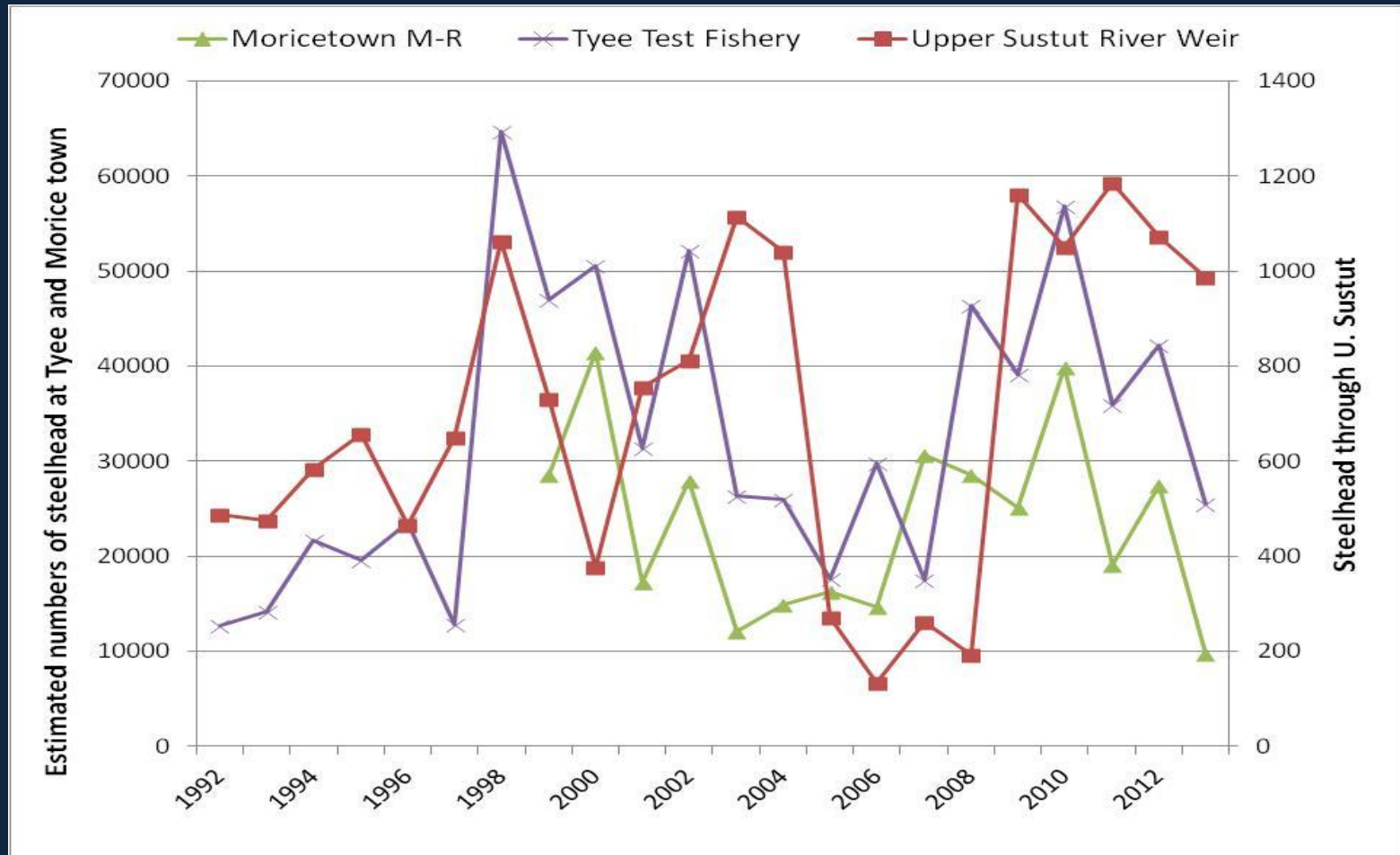
North Coast

Skeena (Interior Summer Stocks)

Estimated Escapement of Skeena Summer Steelhead at the Tye Test Fishery, 1956 - 2013 - All Years to Last Day of the Fishery



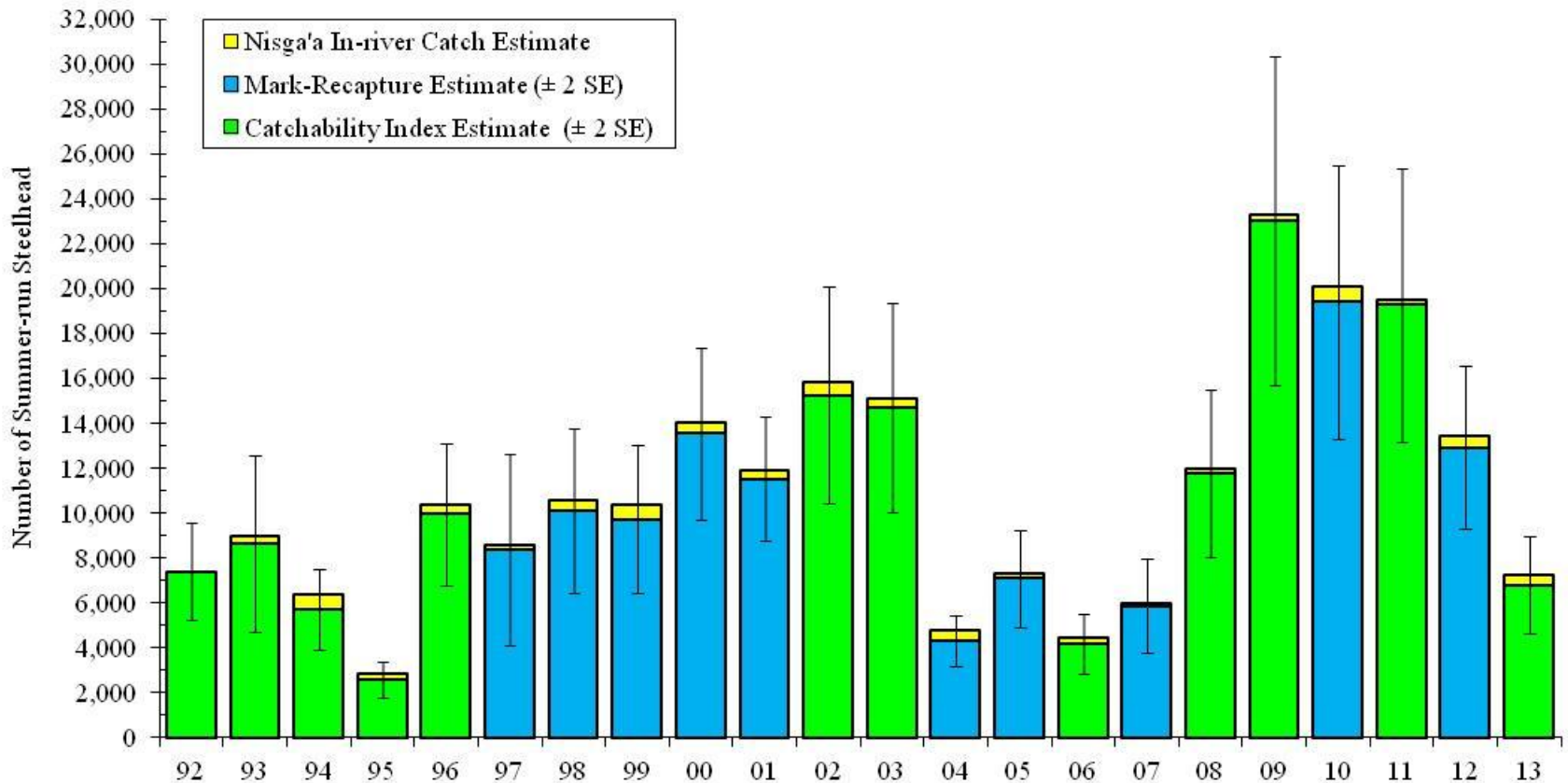
Skeena SR Aggregate, Bulkley-Morice, Upper Sustut



North Coast

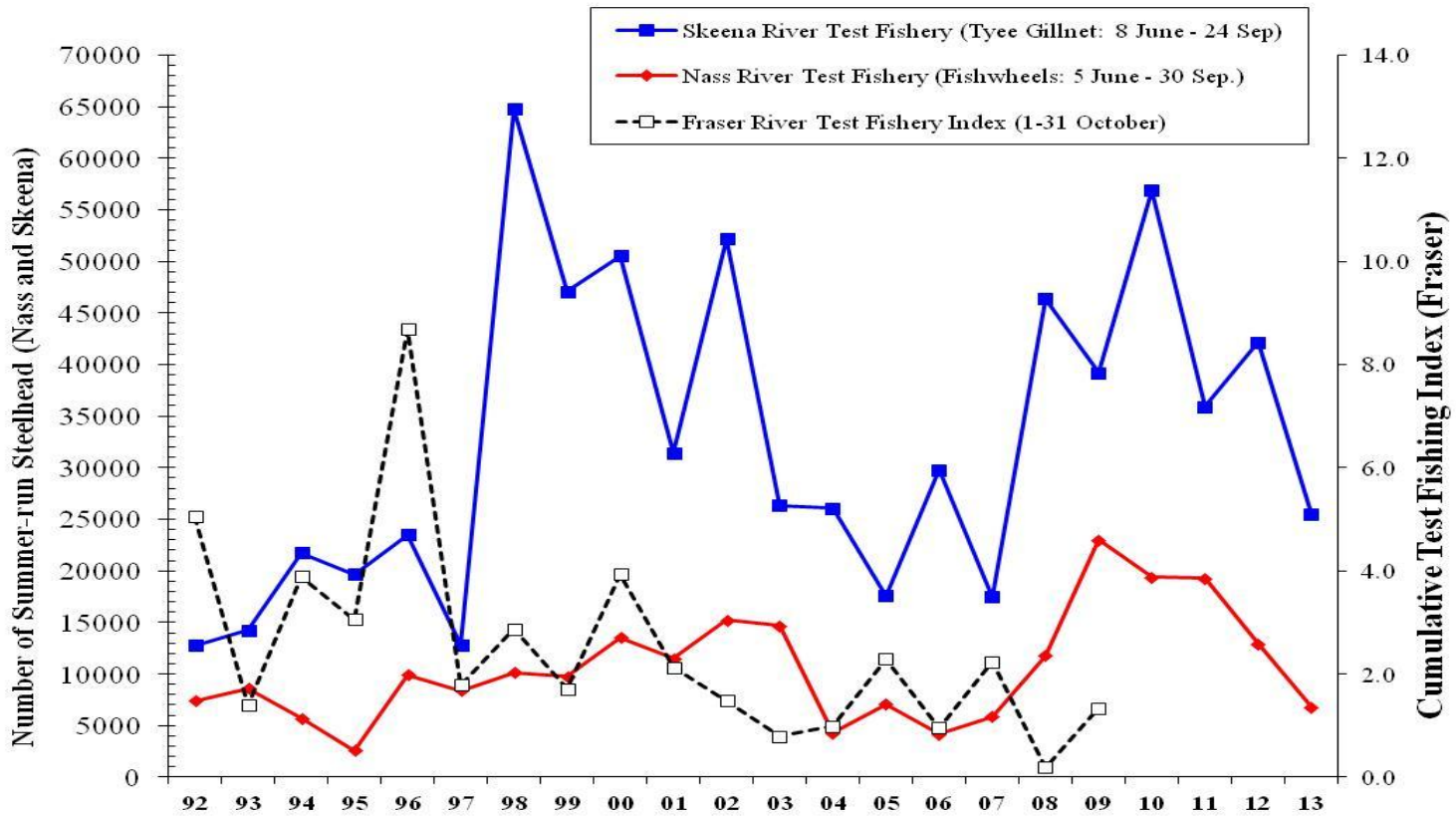
Nass Interior Summer Stock - Fishwheel Data

Adult Summer-run Steelhead Run Size Estimates to Gitwinksihlkw on the Nass River, 1992-2013



Skeena Test Fishery, Nass FW, Fraser Test Fishery (Interior Summer Stocks)

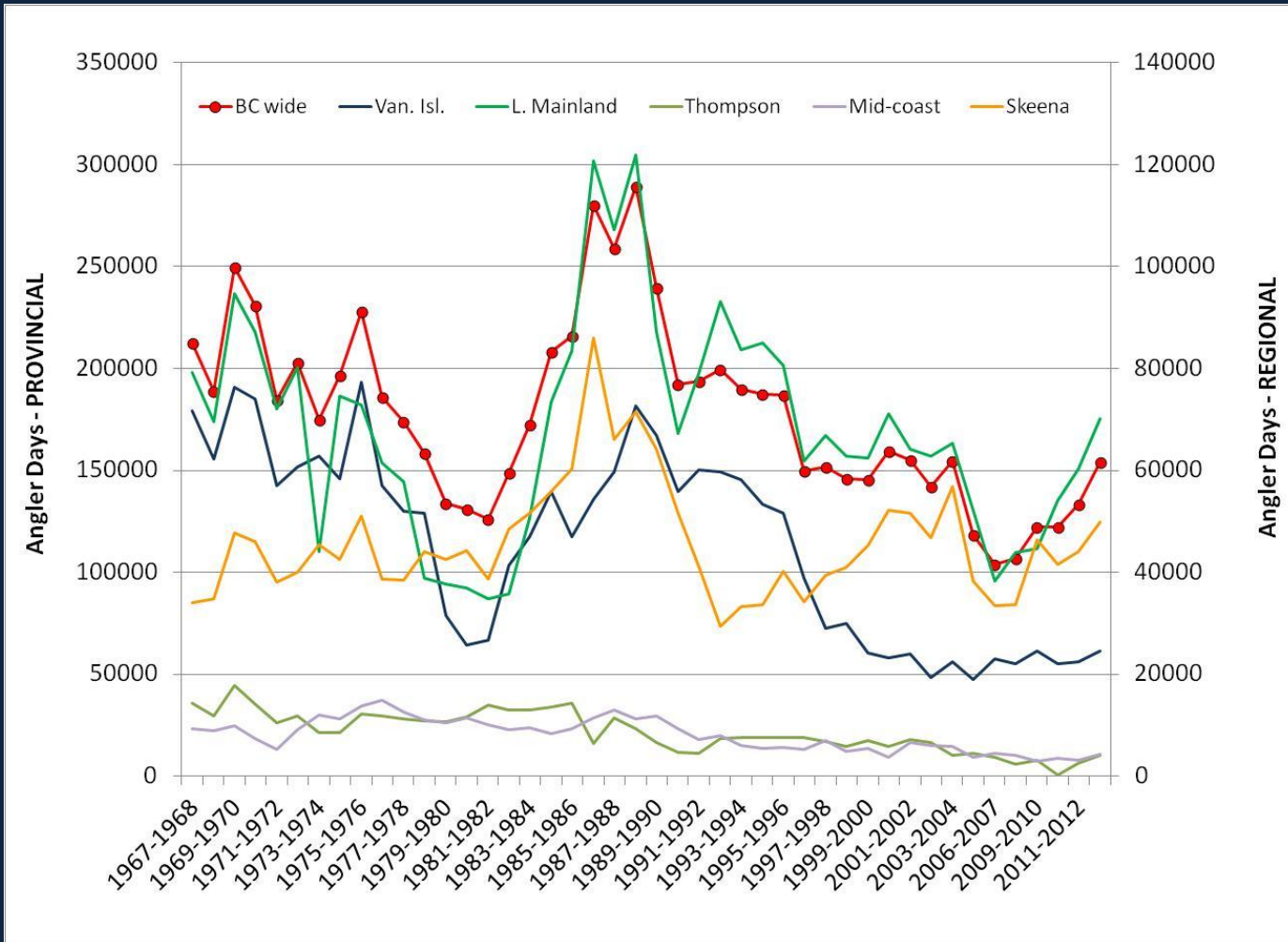
Adult Summer-run Steelhead Returns to BC Test Fishery Sites, 1992-2013



Sport Fishery – Regional Trends

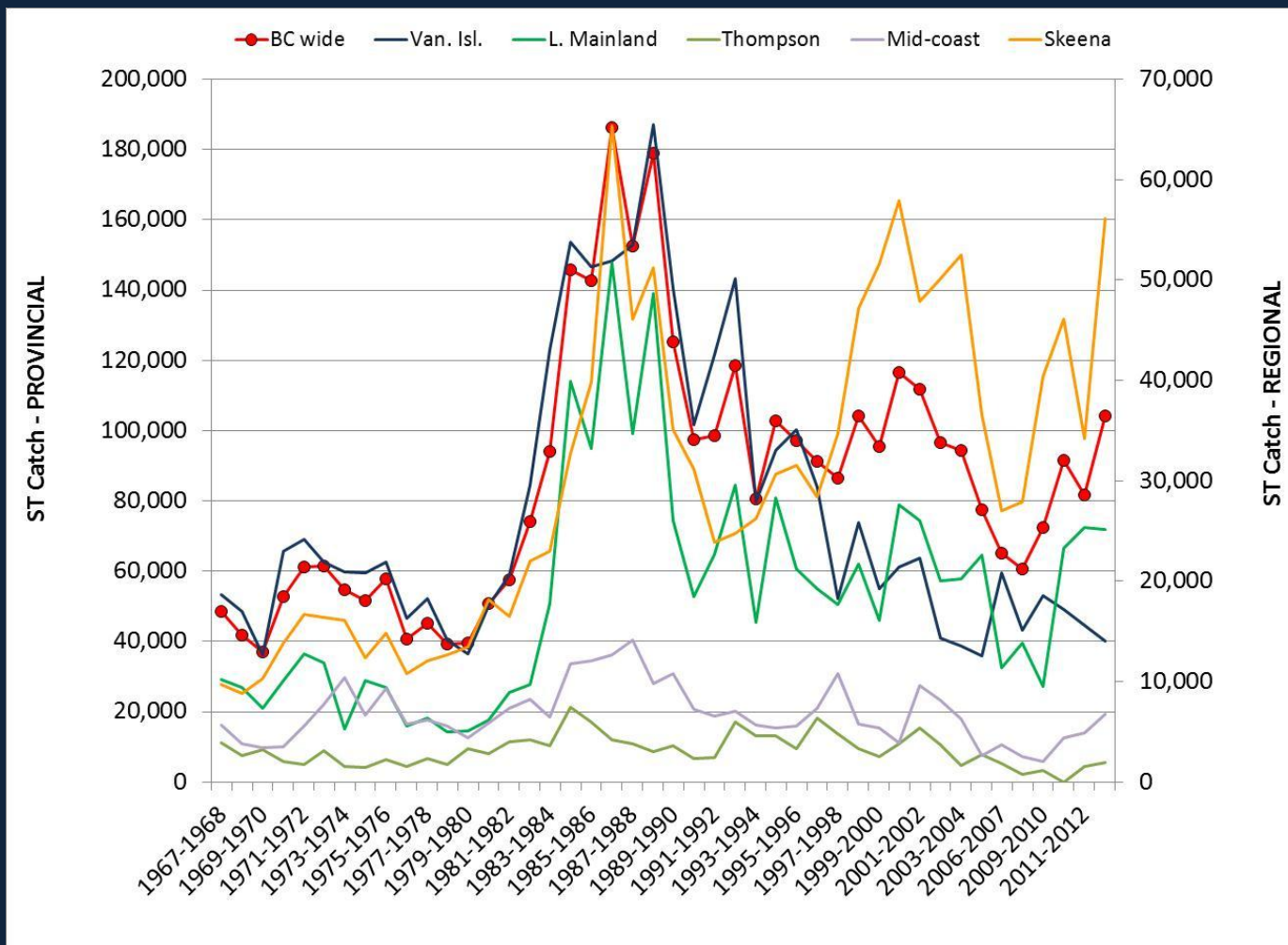
Results of Steelhead Harvest Analysis (SHA)

Effort by Region and Provincially

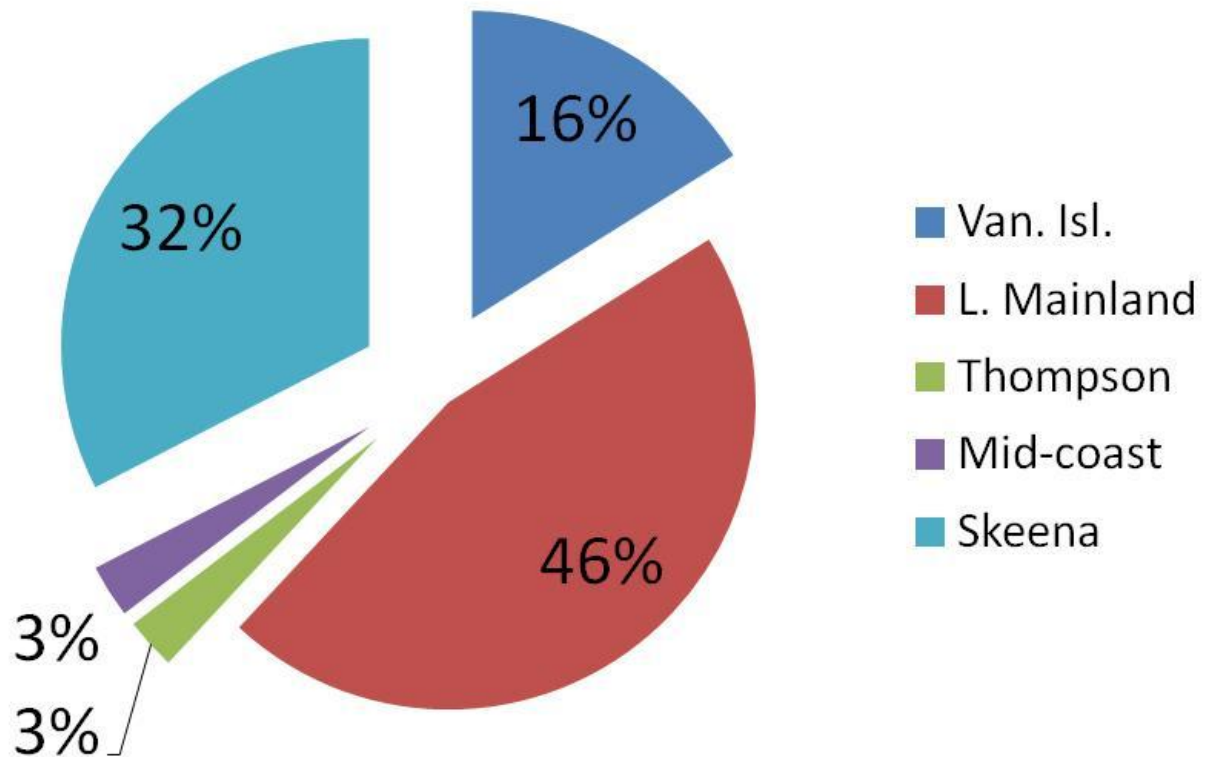


Results of Steelhead Harvest Analysis (SHA)

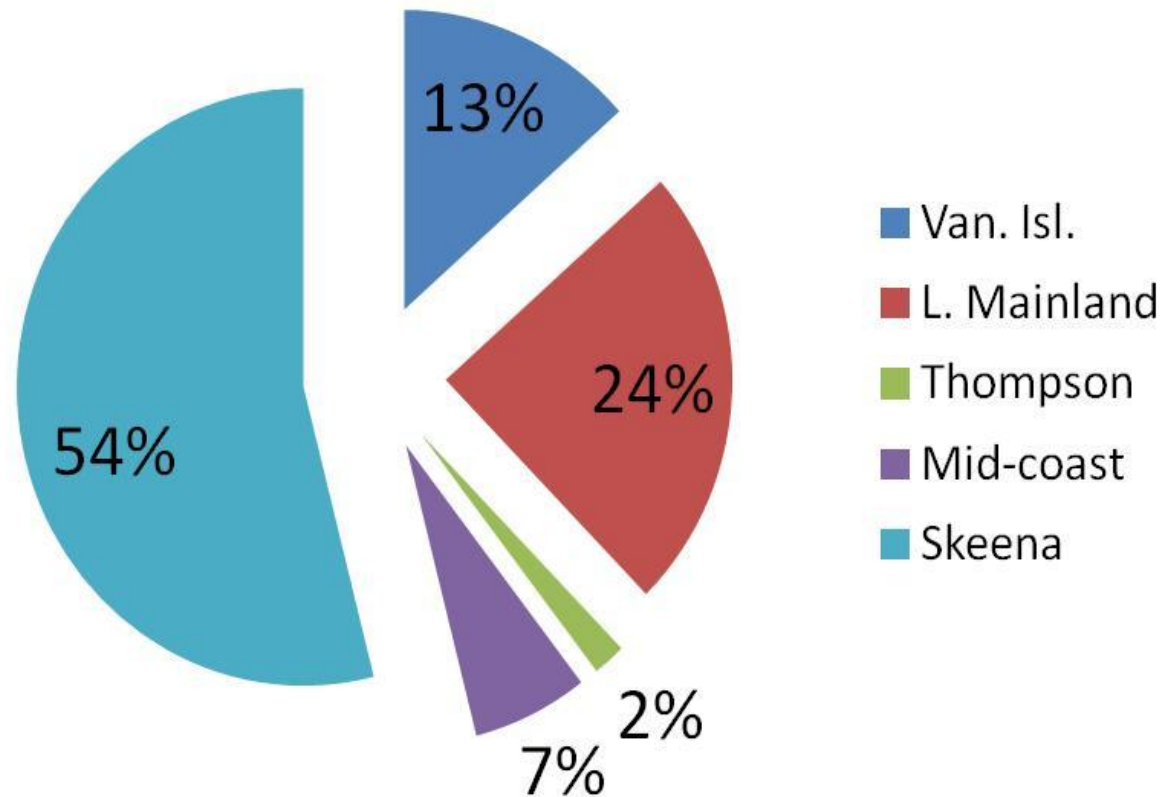
Catch by Region and Provincially



BC Steelhead Angler Days By Region 2012-13

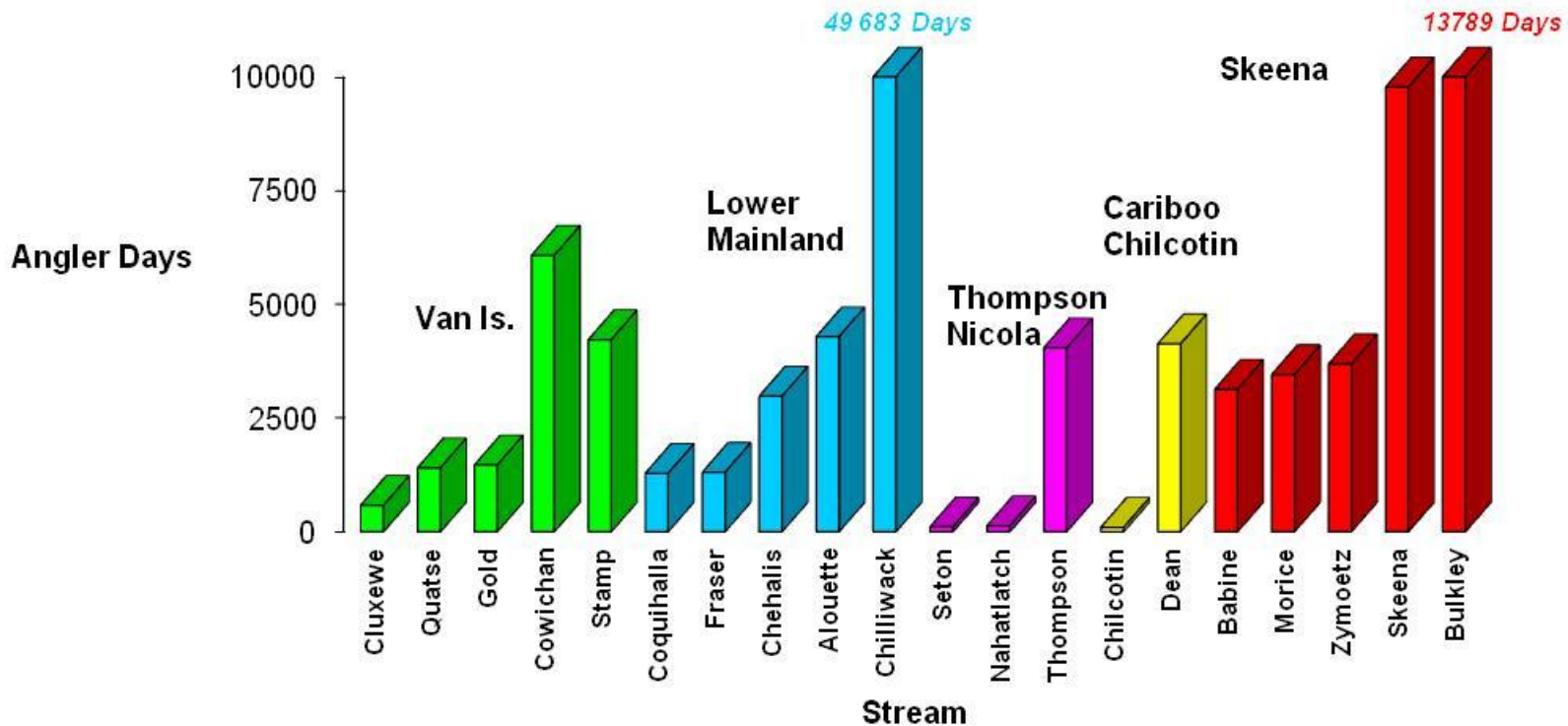


BC Steelhead Catch By Region 2012-13



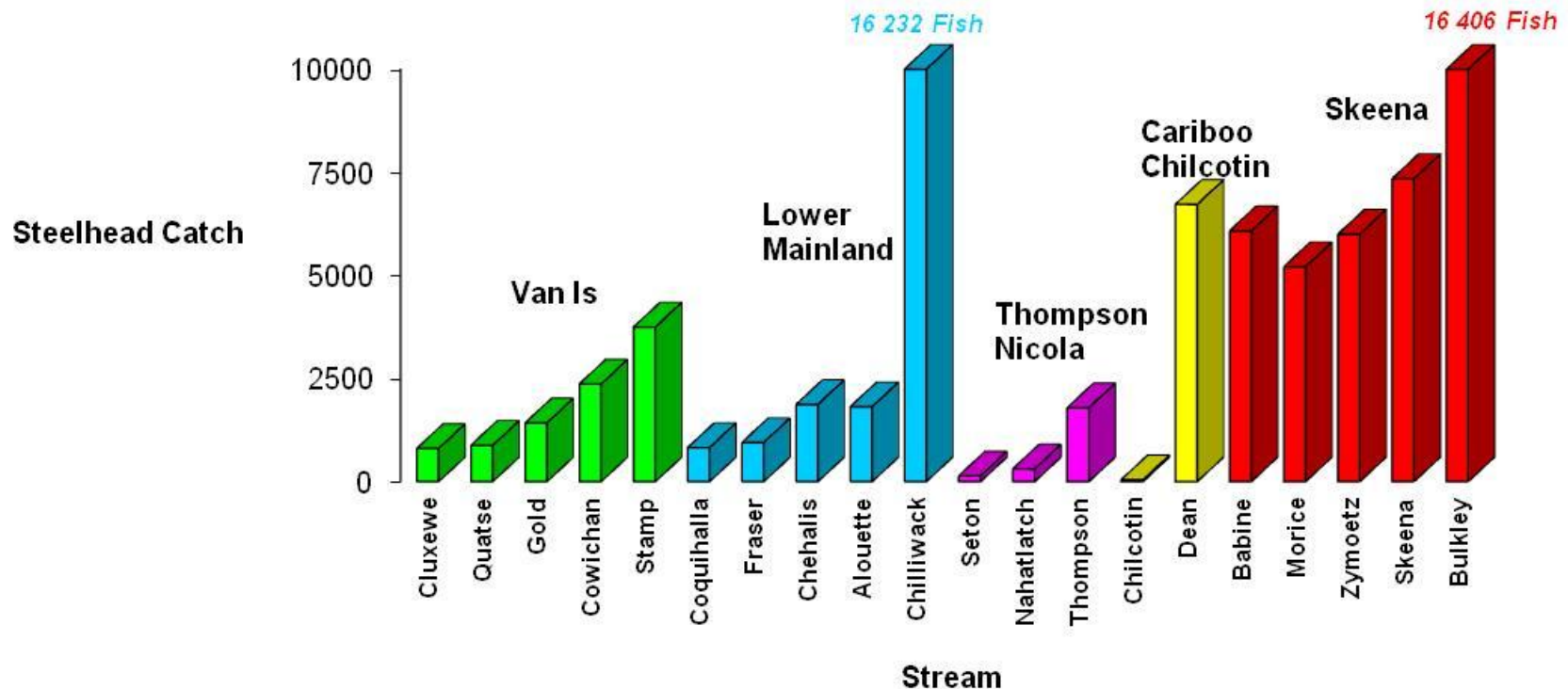
Effort Distribution over Top 5 Streams by Region

Angler Days for the Most Heavily Fished Streams by Region - 2012/13 (From Steelhead Harvest Analysis Data)

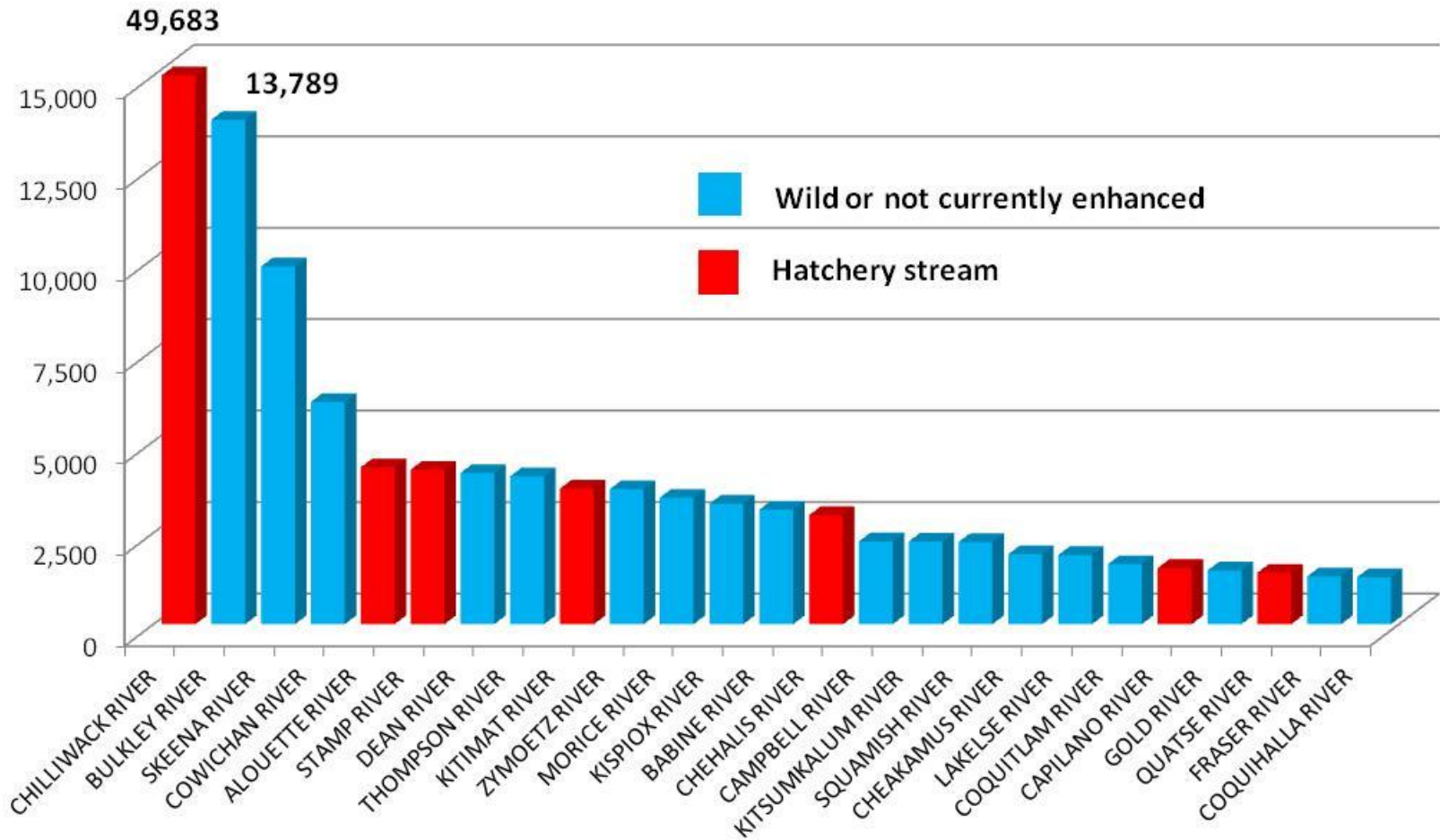


Catch Distribution over Top 5 Streams by Region

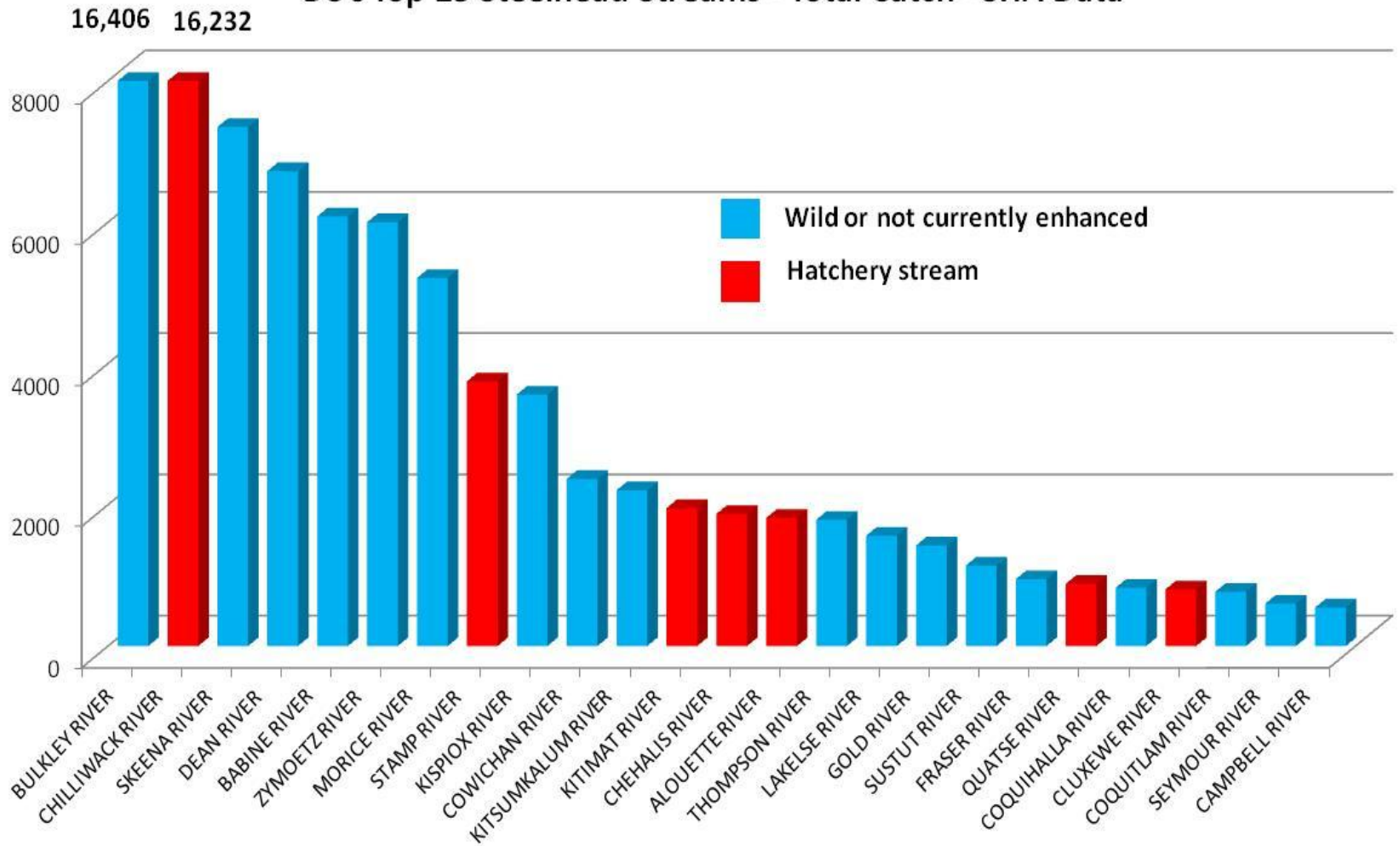
Steelhead Catch for the Most Heavily Fished Streams by Region - 2012/13 (From Steelhead Harvest Analysis Data)



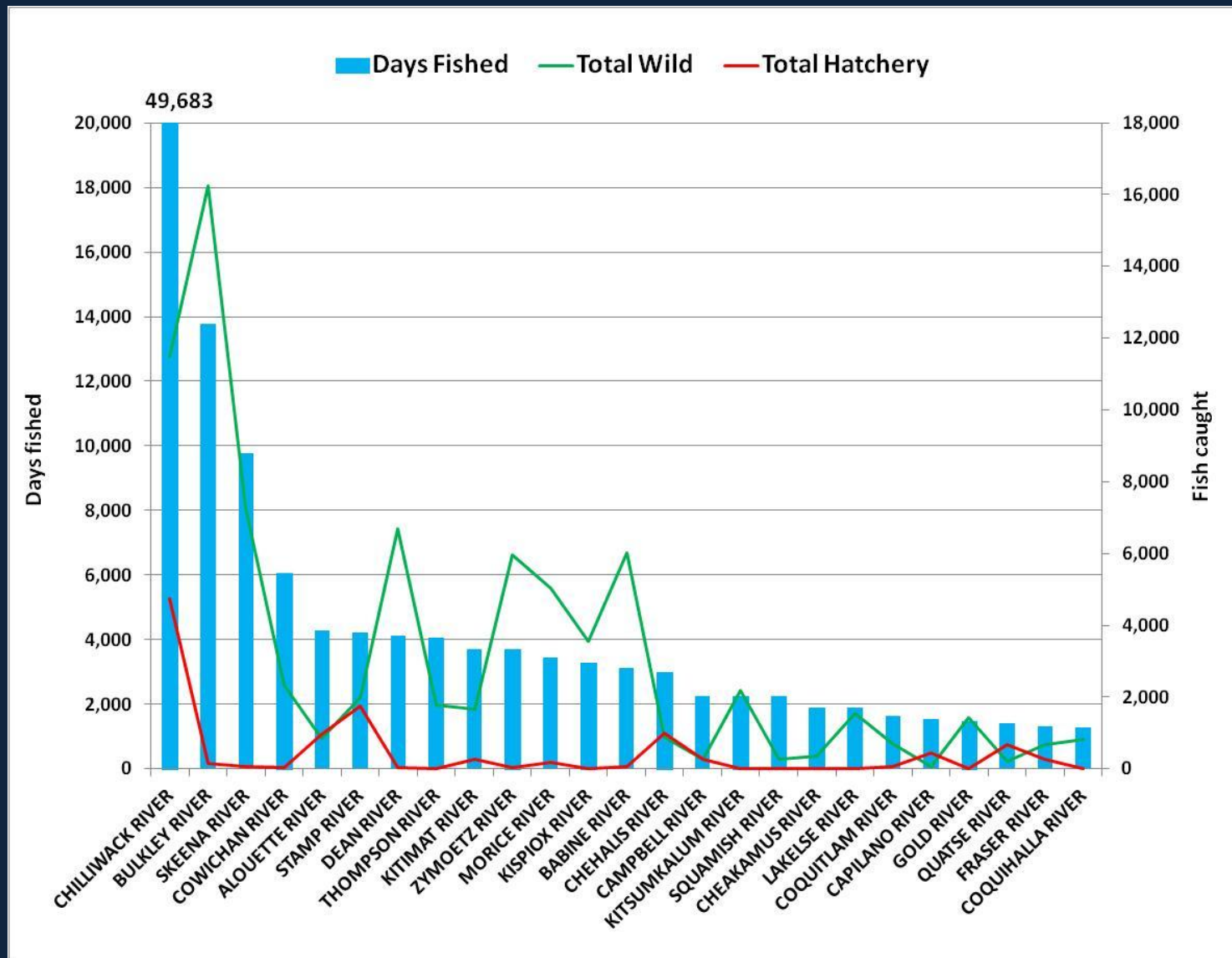
BC's Top 25 Steelhead Streams - Days Fished - 2012-13 - SHA Data



BC's Top 25 Steelhead Streams - Total Catch - SHA Data

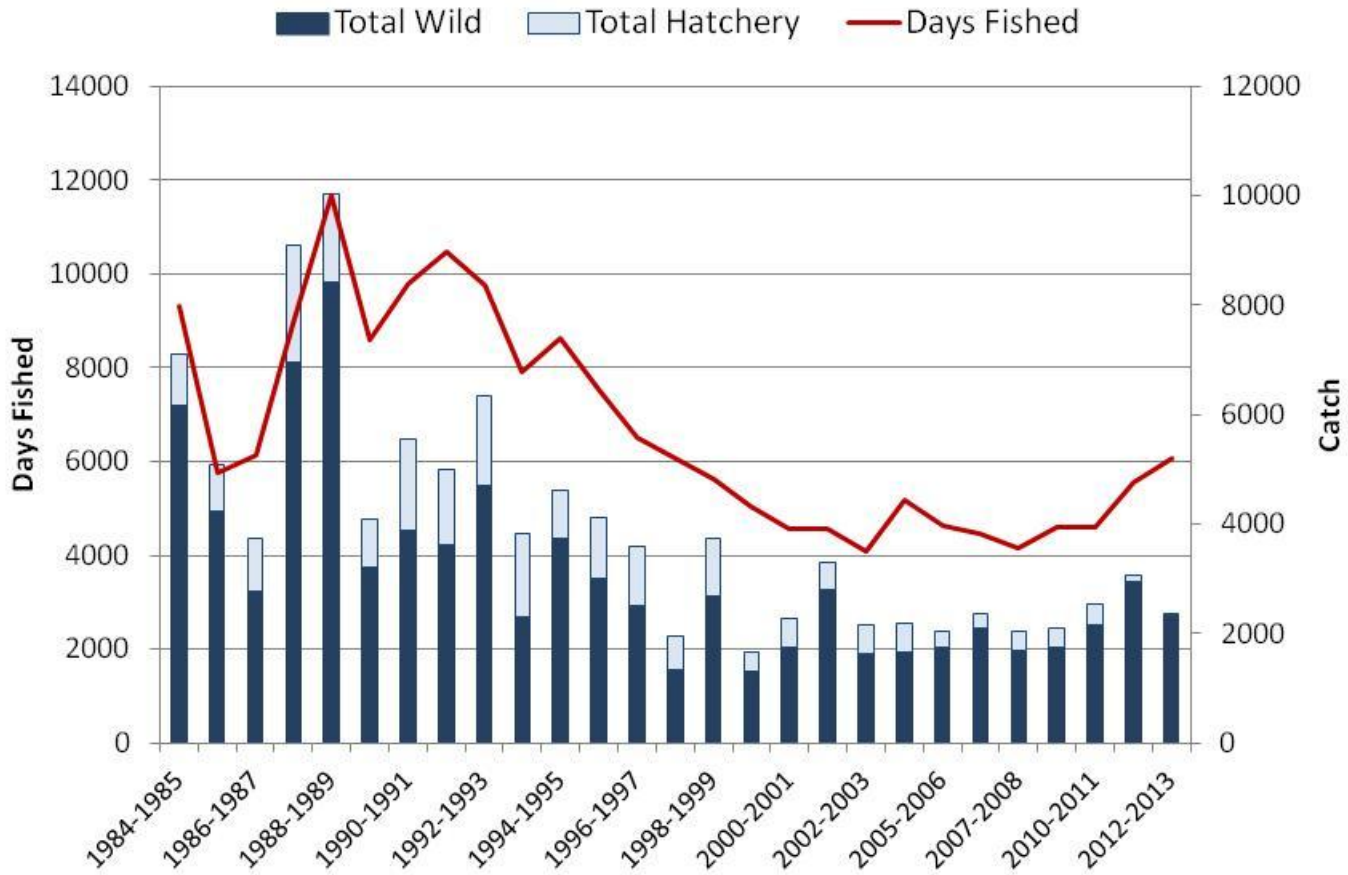


BC's Top 25 Steelhead Rivers – Angler Questionnaire Data



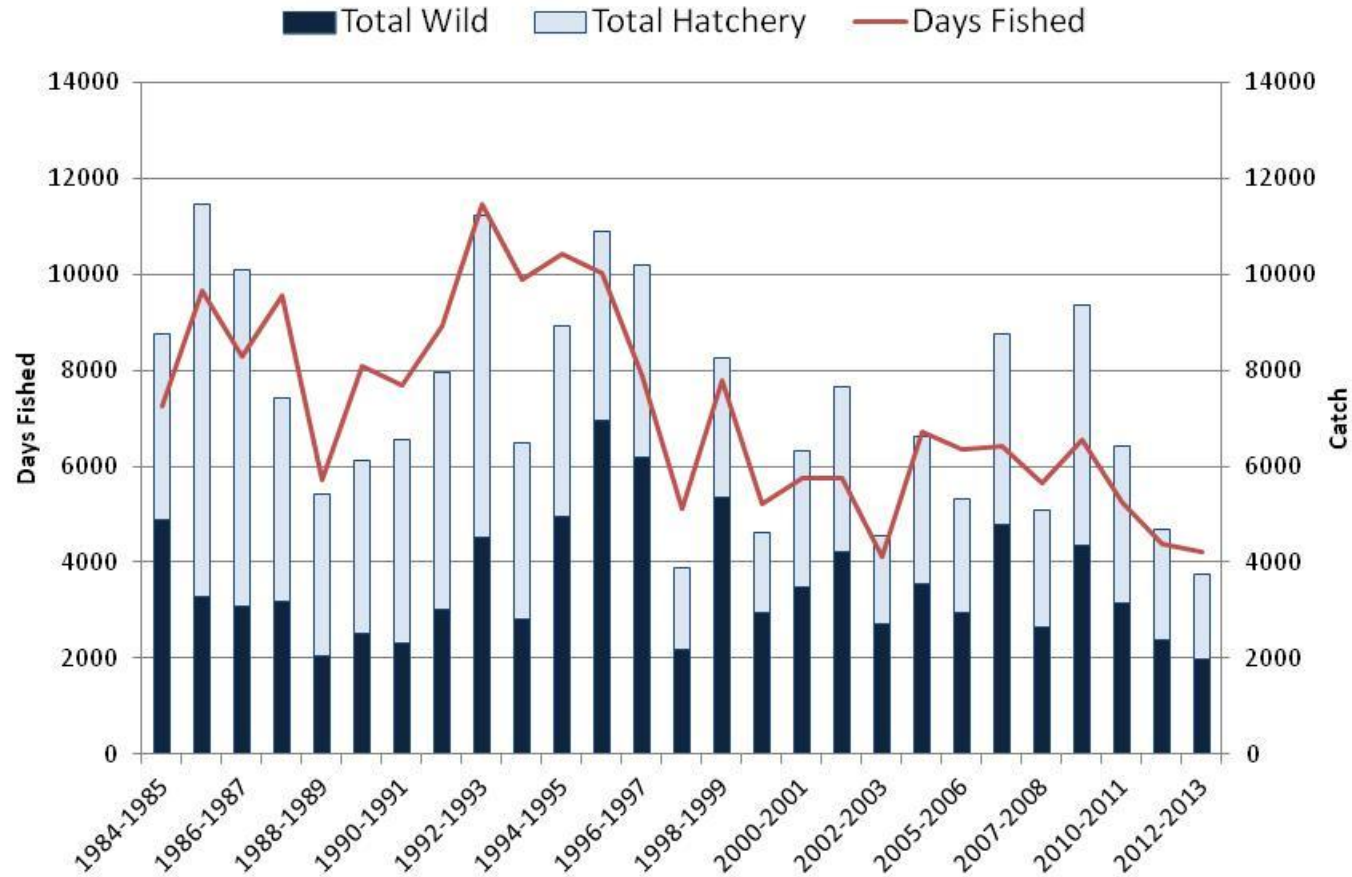
Vancouver Island

Cowichan River - Questionnaire Data



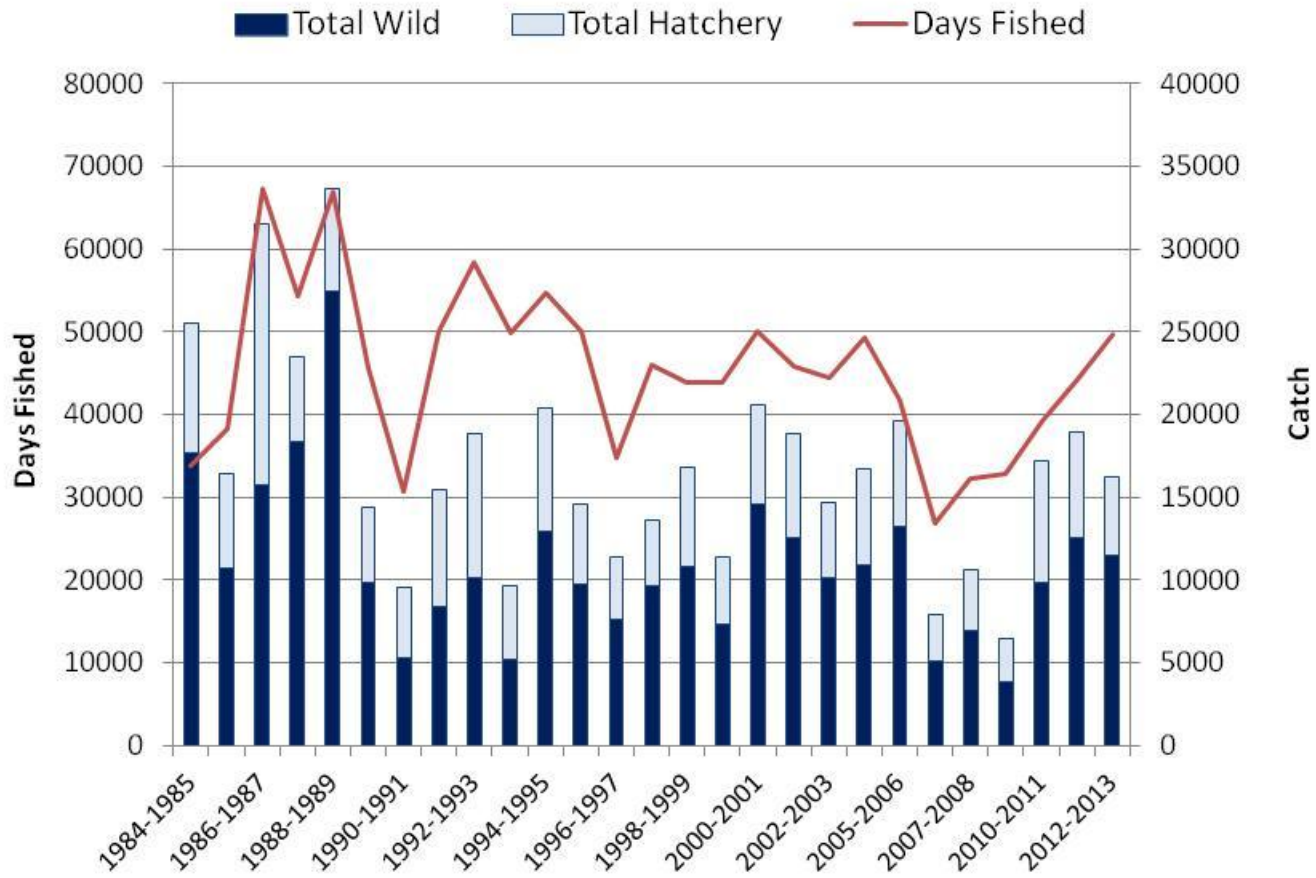
Vancouver Island

Stamp River - Questionnaire Data

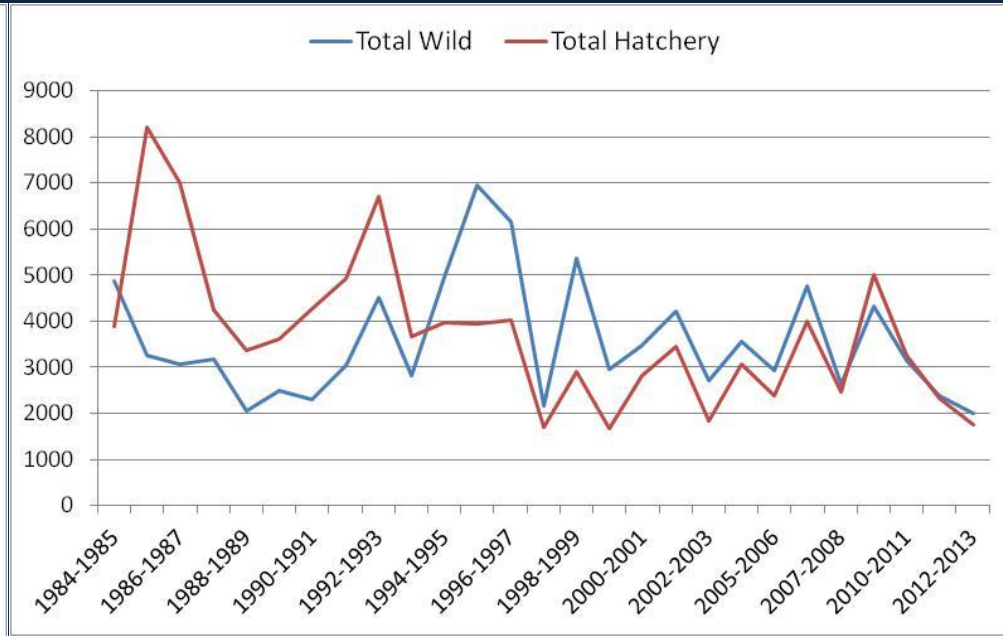
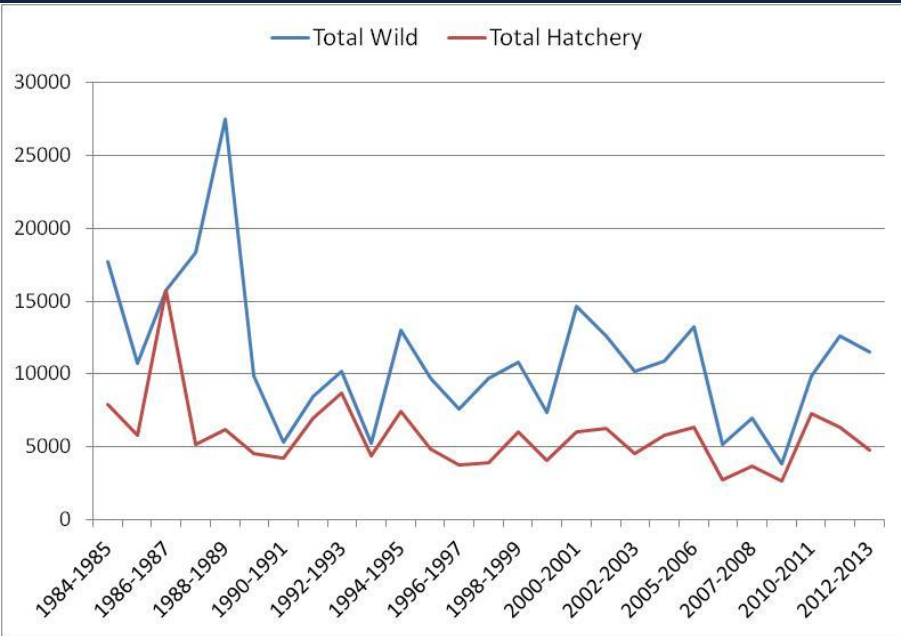


Lower Mainland

Chilliwack River - Questionnaire Data

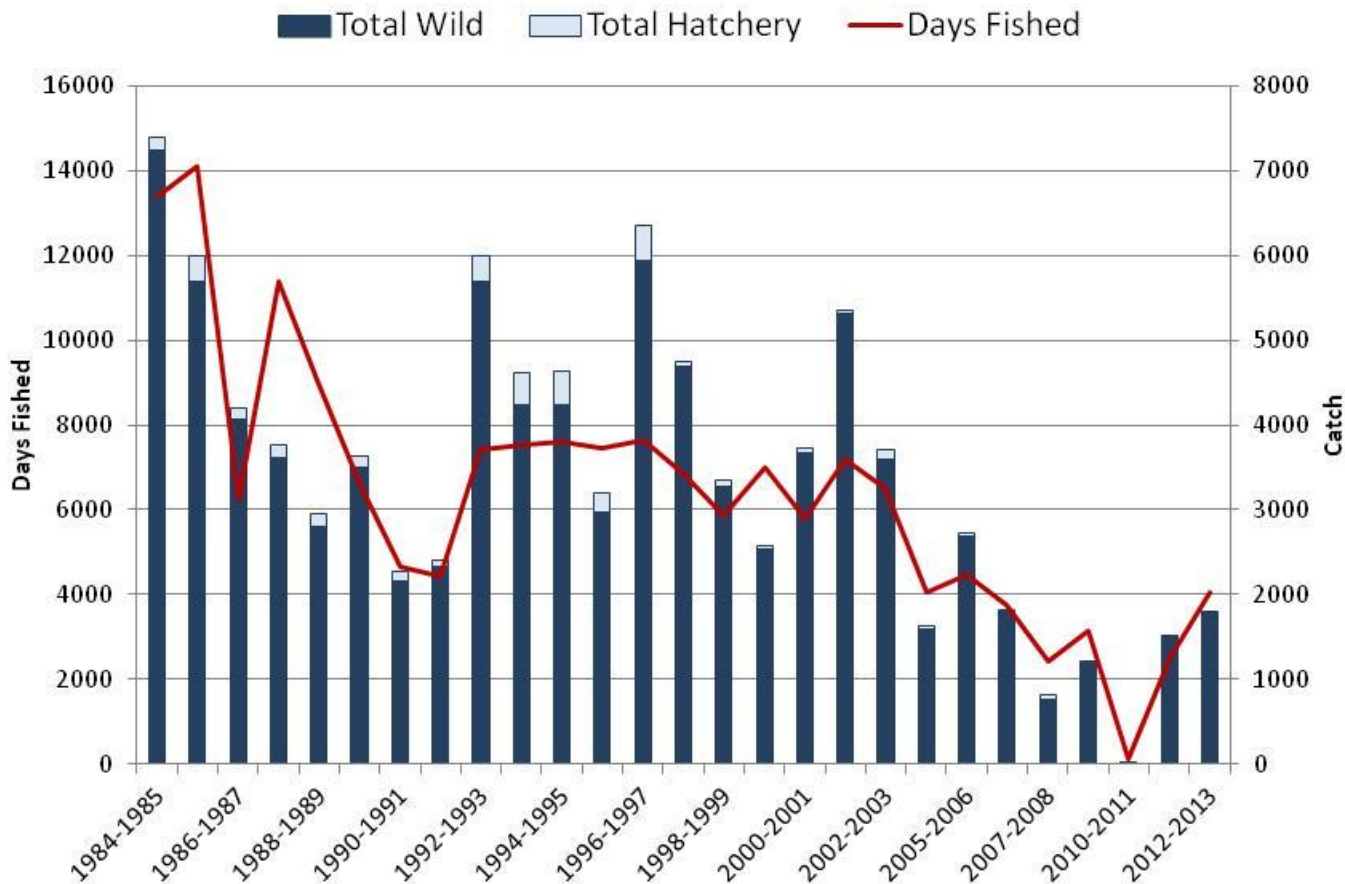


Chilliwack and Stamp ST Hatchery Returns -SHA Data

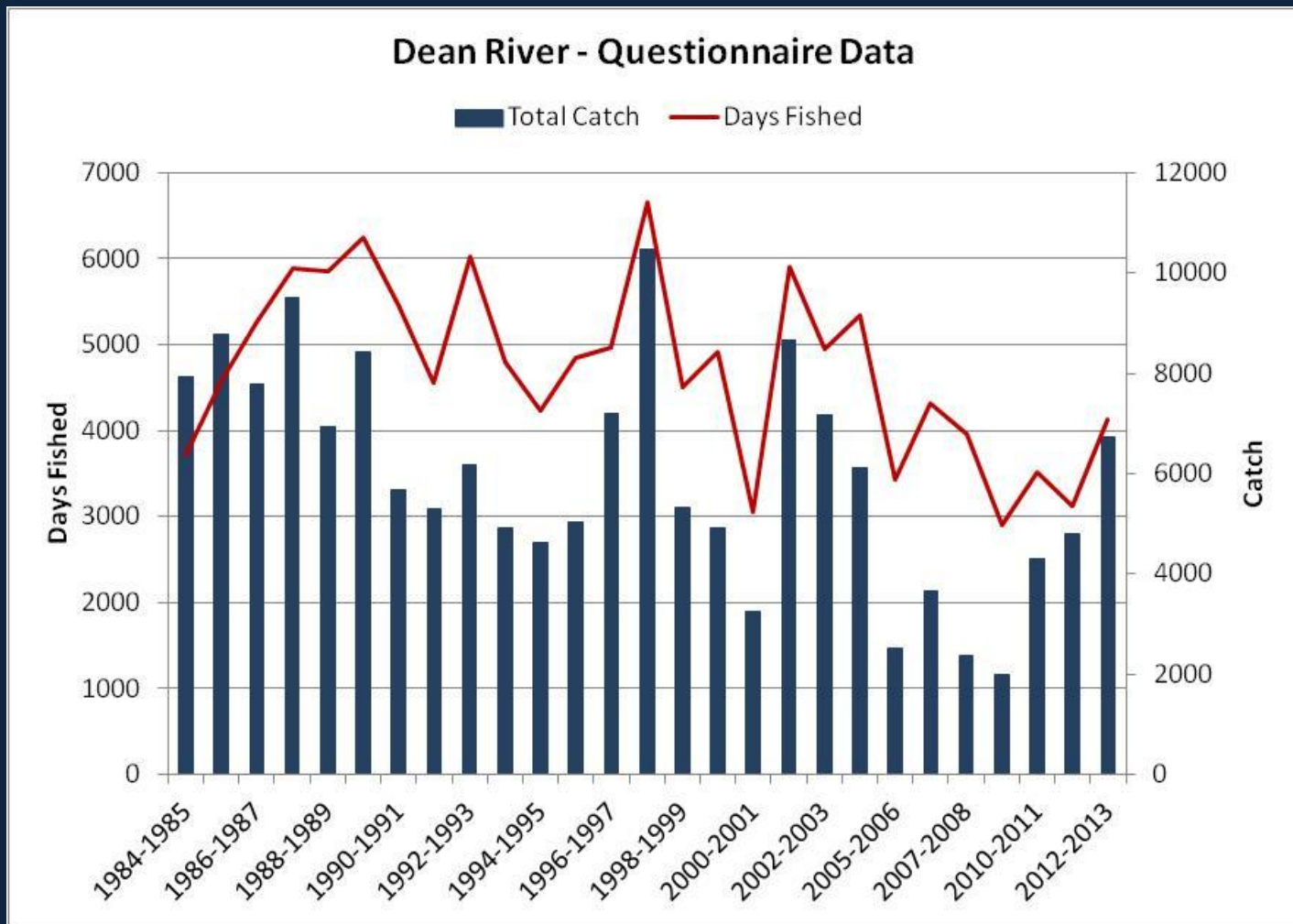


Interior Fraser

Thompson River - Questionnaire Data

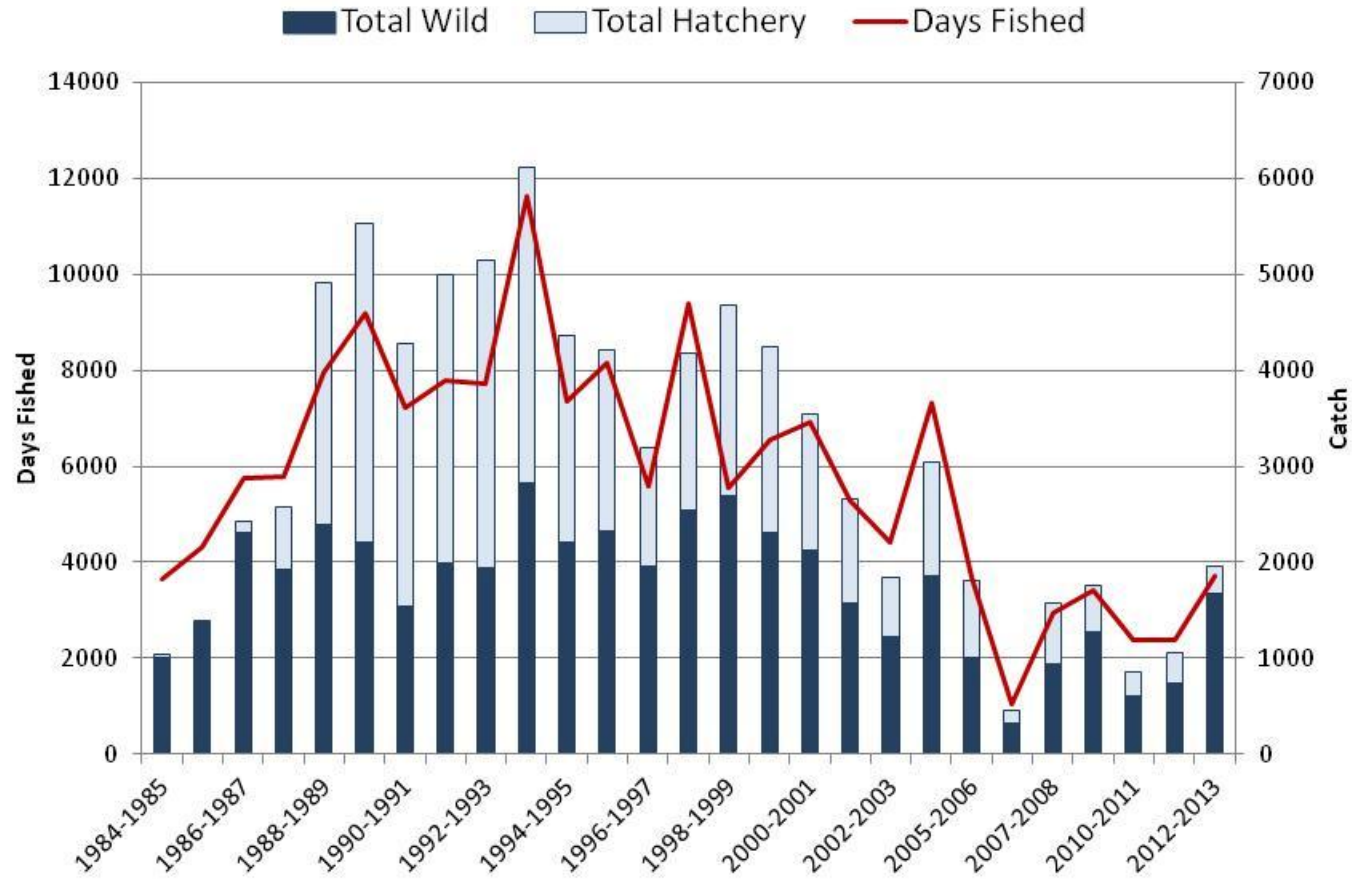


Mid Coast

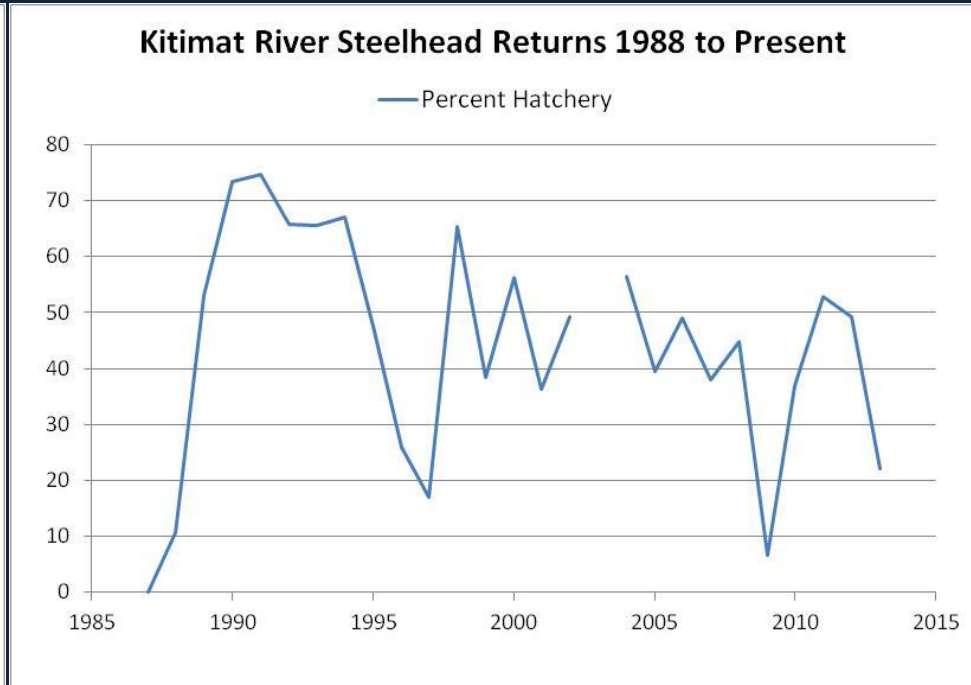
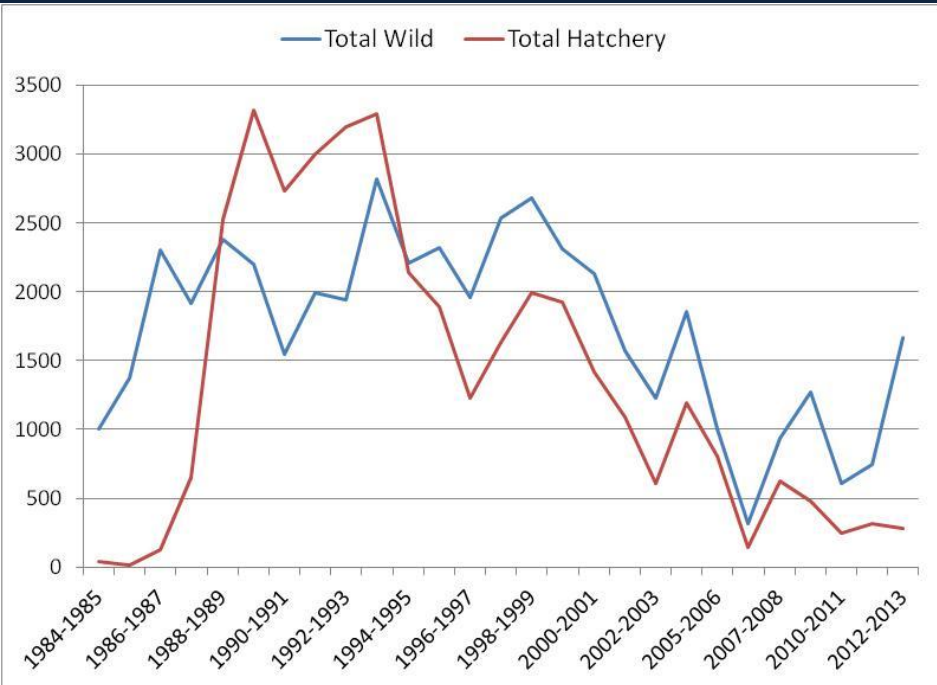


North Coast

Kitimat River - Questionnaire Data

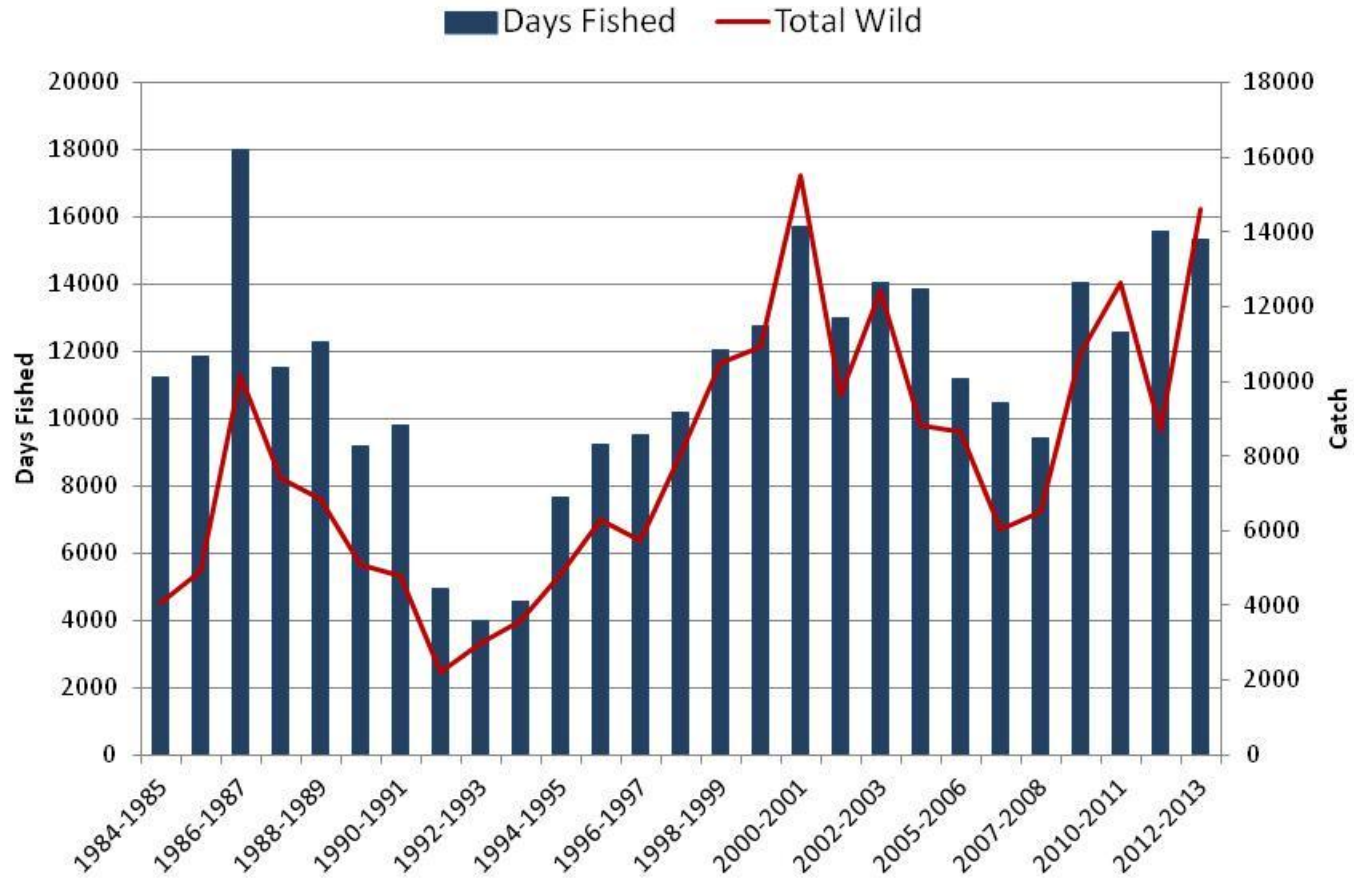


Kitimat River Hatchery Returns – SHA and Brood Collection Data



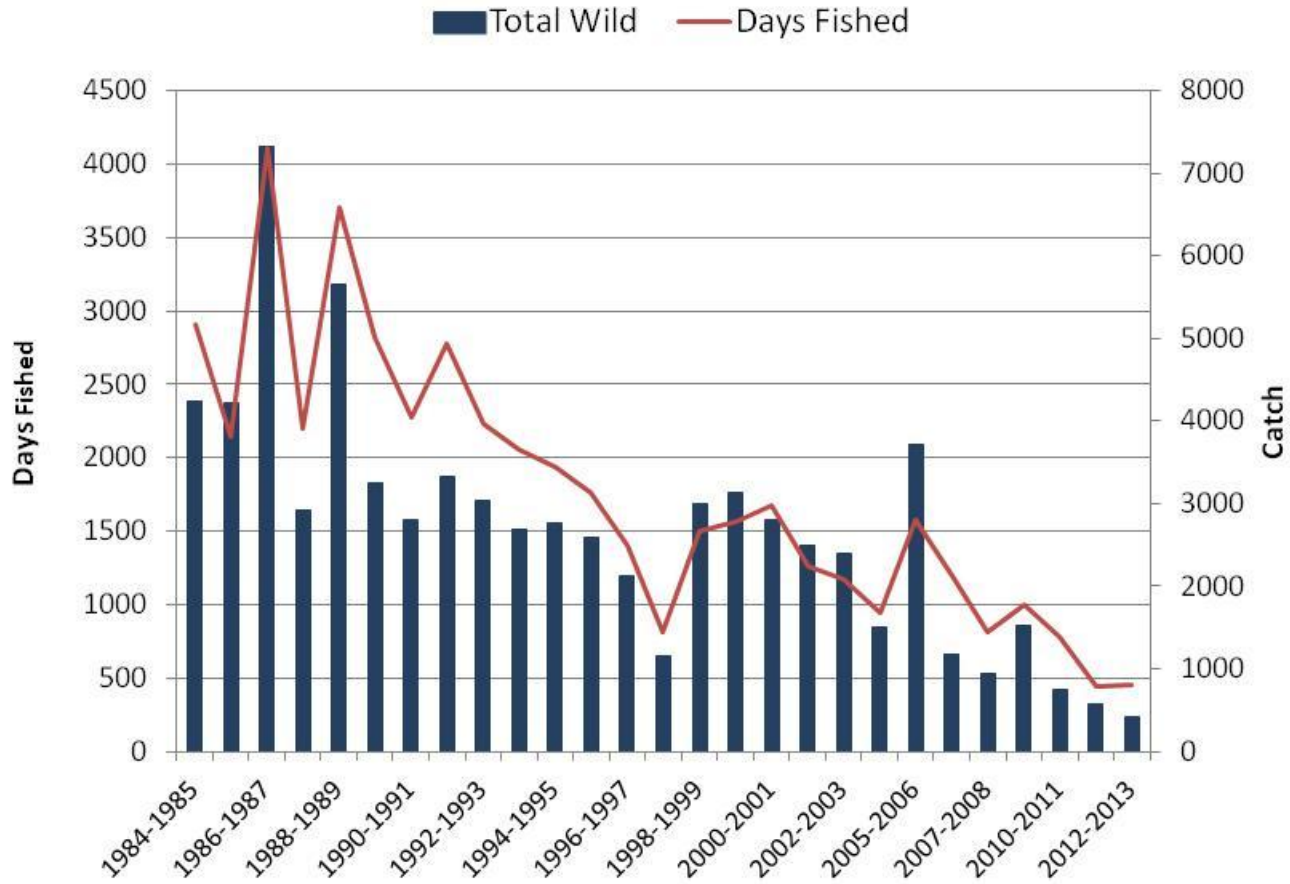
North Coast

Bulkley River - Questionnaire Data



North Coast – Haida Gwaii

Yakoun River - Questionnaire Data



BC Policy, Management and Challenges

Policy, Management and Challenges

Steelhead Stream Classification Policy

- *Classification as wild (default) or hatchery-augmented*
- *All wild fish catch and release, harvest on hatchery fish*
- *Hatcheries only for sport fish augmentation, not rebuilding*
- *Completed 5 year review*

Provincial Framework for Steelhead Management in BC

- *Consistency in management approach while maintaining a diversity of angling experiences*
- *bait ban for all summer run fish?*
- *Seasonal closures where extended freshwater residency occurs*

Interceptions in Tidal Salmon Fisheries

- *Provincial objective: Maximize escapement upstream of where interception occurs by minimize encounter rates in non-selective fisheries*
- *For conservation e.g. Thompson or socio-economic e.g. Skeena*

Resource Development

- *Linear (pipelines, Northern Transmission Line), mines (gold, coal)*

Headwaters of the Skeena, Nass and Stikine Rivers





Acknowledgements:

**Rob Bison
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Kenji Miyazaki
Wallace Cheung
Joe De Gisi
Dean Peard
Richard Alexander
Lee Williston**

Tye Test (Gillnet) Fishery – DFO (1956 – present)



Moricetown Canyon (Bulkley River) Mark-Recapture Project – Wet'suwet'en Fisheries (1999 – present)



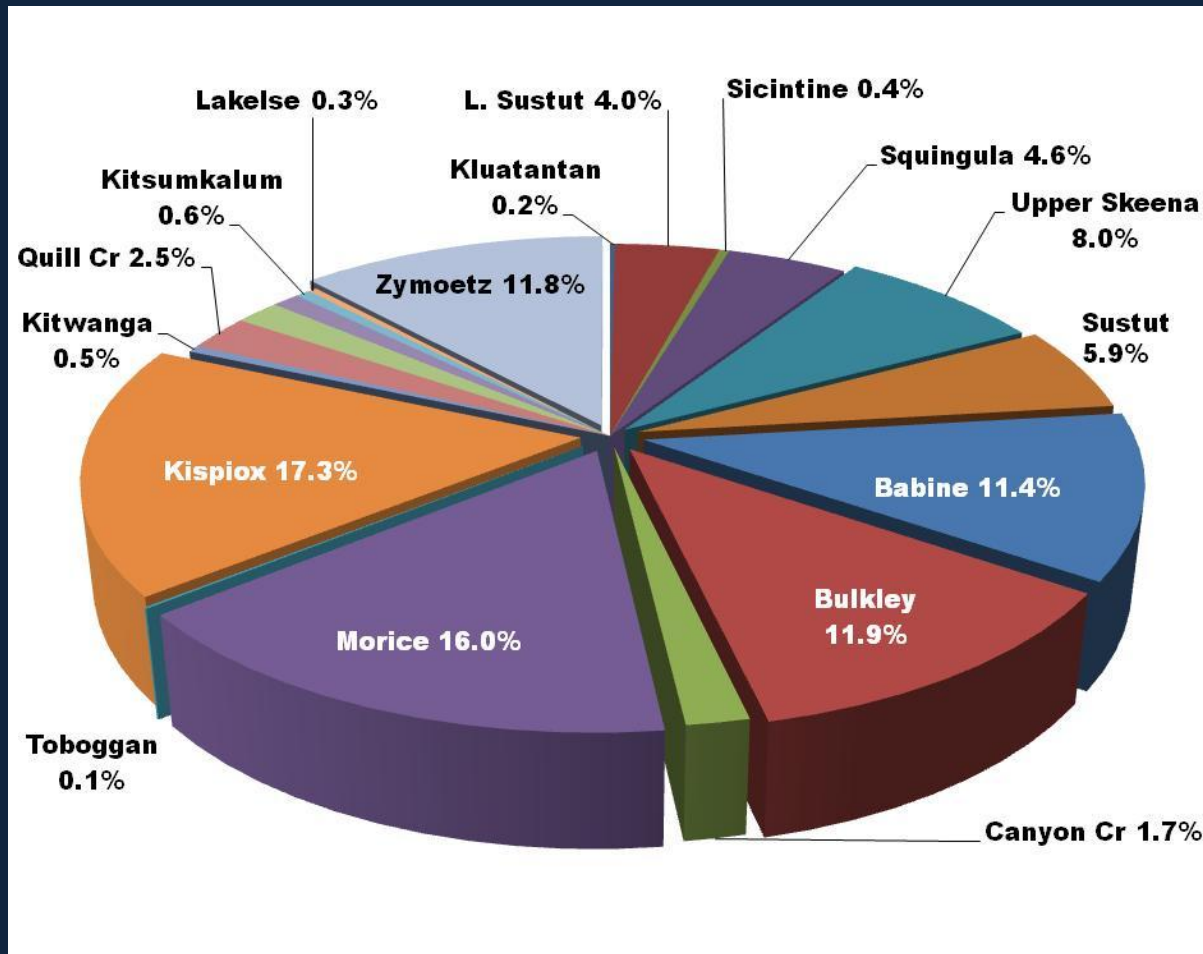
Kloiya River Winter Steelhead Resistivity Counter (2006 – present)



Skeena Region Steelhead Molecular Genetics (1990 – present)



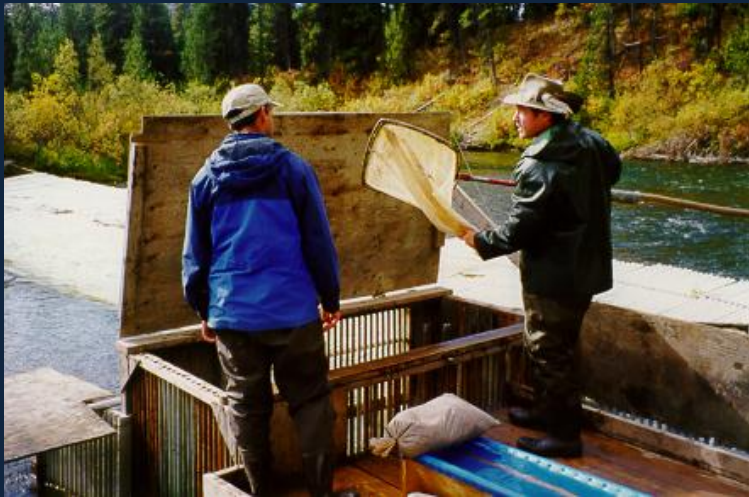
Skeena River Interior Summer Ecotype Stock Composition - 2013



Kitwanga River Resistivity/Dual Beam Sonar – Gitanyow (2003 – present)



Upper Sustut River Enumeration Weir (1985, 1992 - present)



Nass River Fishwheels – Nisga'a/LGL (1992 – present)



Nass Watershed

