

NEWS FROM THE ...

SUMMER 2014

VOLUME FOUR | ISSUE TWO

# Salmon Coast | Field Station

## SPRING RESEARCH 2014

As usual, it's been a busy spring season at Salmon Coast Field Station. This is an dynamic place - always full of exciting new ideas, great enthusiasm, and hard work. Here's a whirlwind tour of some of the research projects hosted this year:

### ABUNDANCE OF SALMON VIRUSES IN THE WATER COLUMN

**March-April 2014:** MSc student Lindsey Ogston and her field crew collected water samples to test for abundance of salmon viruses near active and fallow salmon farm sites in the Discovery Islands and the Broughton Archipelago. See page 2 for more information.

### PARASITES, PREDATORS AND CHUM SURVIVAL STUDY

**April-May 2014:** Ph.D. candidate Stephanie Peacock and her team returned for their second season of experiments testing for predatory juvenile coho preference for juvenile pink over chum salmon as prey, and if that preference changes when prey are infected with sea lice.

### IMPACTS OF SEA LICE ON FORAGING ABILITIES OF FRASER RIVER SOCKEYE SMOLTS

**April-June 2014:** Ph.D. student Sean Godwin and his team continued investigating the effects of sea lice on foraging abilities of Fraser River Sockeye salmon juveniles - a key stage of this important stock's life history that has been little studied. See page 2 for more information.

### MARINE MAMMAL MONITORING

**Ongoing:** Salmon Coast staff, researchers and volunteers have been pitching in to photograph and record sightings of marine mammals.

### LONG TERM SEA LICE MONITORING

**April-June 2014:** Continuing a data set that has been ongoing since 2001, station volunteers and project leader Lauren Portner continued to monitor sea lice levels on juvenile pink and chum salmon passing local salmon farms by sampling weekly throughout the juvenile outmigration season.

### UNDERGRADUATE STUDENT PROJECTS

**May-June 2014:** SFU student Leah Walker studied sockeye salmon smolt growth rates and whether these growth rates are affected by a biological dye, and University of Toronto student Jessica Phillips looked into the effects of coho smolt size on feeding behaviour.

### ECOLOGICAL MODELLING PROJECTS

**Ongoing:** Postdoctoral researcher Andrew Bateman continued his modelling work to explore strategies for avoiding chemical resistance in sea lice associated with salmon farms and wild salmon in BC. MSc student Luke Rogers continued his modelling work to shed light on the question of why Pacific herring abundances remain unpredictable and/or low despite efforts to rebuild these stocks.

## GREETINGS, BROUGHTON VISITORS!



### CONTACT US FOR A TOUR

Website | [www.salmoncoast.org](http://www.salmoncoast.org)  
 Facebook | [facebook.com/salmoncoast](https://facebook.com/salmoncoast)  
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 VHF | "Salmon Coast" on Channel 16



# SPRING 2014 RESEARCH HIGHLIGHTS

## IMPACTS OF SEA LICE ON FORAGING ABILITIES OF FRASER RIVER SOCKEYE – YEAR TWO

Sean Godwin, Ph.D. student, Simon Fraser University

Pathogens frequently cause indirect effects that increase host mortality and reduce host fitness. Examples of indirect effects include impacts on host behaviour, growth, and competitive ability, each of which can in turn affect the survival of the host. Sockeye salmon is one species of conservation concern that may be particularly vulnerable to pathogen infection; juvenile sockeye pick up high numbers of sea lice during their marine migration to their winter feeding grounds, and these infestations have been linked to fish farms in the Discovery Islands of BC.

In BC Fraser River sockeye constitute an iconic set of stocks that together make up one of the most ecologically, economically, and culturally important salmon populations in the world. Fall 2012 marked the conclusion of a 26 million dollar federal judicial inquiry into the causes of the decline in Fraser River sockeye productivity over the past two decades. The final report of this inquiry suggested that the causes of the decline may originate in the nearshore marine waters where the fish grow, and it identified pathogen interactions of sockeye with salmon aquaculture operations as a major management uncertainty and research priority.

Sean's multi-year research project focuses on the effect of sea lice, an important salmon pathogen, on the competitive foraging abilities of juvenile Fraser River sockeye. In the spring of 2013, Sean performed a competitive foraging experiment at Salmon Coast to determine whether wild juvenile Fraser River sockeye with high infection intensities of sea lice have reduced competitive abilities. This spring, again based out of Salmon Coast, Sean performed field surveys in Johnstone Strait to determine if wild-feeding sockeye also exhibit reduced competitive abilities with high louse loads, and whether this relationship is accentuated with lower prey abundance.

Results from Sean's project are particularly important in the context of fish life histories, as early marine growth can govern survival. Understanding how pathogens like sea lice interact with fundamental ecological processes that determine fish survival, such as competition and predation, is essential for effective marine conservation of populations vulnerable to pathogen infection.



## ABUNDANCE OF SALMON VIRUSES IN THE WATER COLUMN

Lindsey Ogston, MSc student, University of Toronto

Viral disease linkages between Atlantic salmon aquaculture and wild Pacific salmon are poorly understood. In general infectious diseases can have serious negative impacts on both farm and wild fish populations, but the potential for viral transmission between farmed and wild salmon has not been rigorously assessed. The levels of viral salmon pathogens in the marine environment remains unknown.

Lindsey is examining how the abundances of salmon viruses in the water column vary with respect to the presence of active Atlantic salmon farms. This spring, she collected water samples from around the Broughton Archipelago and the Discovery Islands. Having transported the samples to the University of Toronto, she is now analysing them to measure viral abundance. This final step will use "quantitative polymerase chain reaction" (qPCR), a technique to measure the concentration of specific genetic signatures.

### How you can help support SCFS's conservation and education work in the Broughton Archipelago

**We are a small non-profit organization and rely significantly on support from citizens who believe in the value of our work.**

**General Monetary Donations** – All contributions will be put to efficient use, allowing us to continue our conservation and education initiatives and work towards increasing our capacity in the coming years.

**Directed Donations** – These donations can be aimed to help with a specific project or research area you would most like to support. Or, for \$850, you can sponsor a volunteer for a month to help with research and other essential tasks at the station .

**In-Kind Donations** – We always on the lookout for useful equipment in good working order. See our online "Station Wishlist" for items we need most!

**Citizen Science** - Report local Marine Mammal sightings and unusual marine life or events to SCFS

### To Donate:

- Donate online at [www.salmoncoast.org](http://www.salmoncoast.org)
- Send a cheque to: Salmon Coast Field Station Society, General Delivery, Simoom Sound, BC, V0P 1S0
- Drop in to SCFS, or use our donation box at Billy's Museum

*If you include your contact information with your donation, we would love to send you a personal thank you for your support!*





## JULIA SIMMERLING

*This spring, Julia completed her third year at Quest University, where she is focusing her studies on the relationship between coastal communities and marine conservation.*

From April - June, I volunteered with the Sea Lice Monitoring project, learning to identify species and life stages of the juvenile salmon and their sea-lice parasites. Looking at wild salmon under a hand-lens was absolutely fascinating and I have gained a new appreciation for these spirited fish.

When not assisting with research, my time at Salmon Coast has been spent working in the garden, planting, watering, weeding and landscaping with Station Coordinator Zephyr Polk. Collecting seaweed to nourish the soil was one of my first tasks, for which Zephyr and Coady's six-year-old daughter Salix happily assisted me. She told me about all the edible plants on the property as she picked liquorice root, mint leaves, flowering kale, and apple blossoms for our hair.

When I find myself trying to explain the beauty and simplicity of living out here to others back at home, I feel as though it cannot be fully captured in a conversation or on paper. Salmon Coast is a magical place. One must taste for ones' self the tart salmonberries tucked beneath the brush, harvest kale for salads and thick rhubarb stalks for pie, watch barnacles feed and schools of pink and chum leap in the shallows along the shore, smell the sweet buttercup fields at Echo Bay, hear the hummingbirds pass you by, and crack your first crab on the dock.

# SPRING 2014 VOLUNTEER TESTIMONIALS



## JESSICA PHILLIPS

*This spring Jessica held an Undergraduate Student Research Award at Salmon Coast. In the fall, she will start her third year studying ecology and evolutionary biology at the University of Toronto.*

Stepping off a sailboat carrying a 70 litre backpack and a box of food, I didn't quite know what to expect, but Salmon Coast Field Station welcomed me with open arms. Salmon Coasters patiently taught me how to tie knots, chop wood, start fires, cook for 16 people, seine for fish, and the list goes on (I still need some practice on throwing Frisbees in the forest). Having spent the majority of my life in densely populated cities, I was introduced to a different way of seeing and interacting with the world at Salmon Coast.

I received an NSERC Undergraduate Student Research Award under Professor Martin Krkosek to study how the size of coho salmon affects their feeding behaviour. Helping Ph.D. candidate Stephanie Peacock with her experiments gave me insight into the effort needed to organize field experiments and minimize error, as well as deal with unpredictable weather. Putting together my experiment was a challenge, but with guidance from mentors and the energy poured in by my peers, the experiments were conducted successfully.



## MACK BARTLETT

*Mack recently graduated from Dalhousie University with an undergraduate Honours Biology degree.*

What first attracted me to Salmon Coast Field Station was the idea of visiting such a wild and isolated region of BC's coast. I didn't know what to expect before coming up here, but I have been incredibly happy with what I found. It has been so fulfilling to take in the Broughton's beauty and help further our understanding of it at the same time.

The Broughton Archipelago makes you feel as if you are the first person to set eyes on its landscapes, yet wherever you look you find signs that people have been flourishing here for generations. I have also been surprised to see the numbers of yachts and summer visitors as the spring passes, as the area feels so disconnected from the outside world. It has been incredible to get to know both the locals and other visitors to the station. People from many backgrounds have all come together to live and relish what the Broughton Archipelago has to offer. It is great that everyone has been so keen to try new things and get out and get dirty on a whim!

I came up here to assist with a Ph.D. candidate's research project on interactions between salmon species and the effects of sea lice, but the station has offered so much more than just a place to help with research. It has become a home away from home. It makes you slow down and re-evaluate the important things in life, just sit back and watch the clouds roll by.



## Spring at Salmon Coast

Throughout our busy spring research season, we also found time to host a number of interesting visitors and events.

We hosted an **Ecological Modelling Conference** at the end of May, with visiting academics from across Canada. It was a pleasure to witness discussions between extraordinary thinkers and consider the various perspectives they brought to the table.

We gave tours to **St. George's School** outdoor education students kayaking through our area, and appreciated the many hours of volunteer labour contributed by youth and instructors with **Coastal Challenges** canoe trips.

We had another successful **SCFS Pie Competition** this year - so successful that it was declared a draw - and between intensive bouts of sampling and experiments, Salmon Coast staff and project leaders helped facilitate researchers and volunteers in exploring many spectacular areas around the Broughton.



## Summer Plans

As our spring research season winds down, we are shifting gears towards a summer of outreach and education.

We are excited to be hosting a **UBC Marine Mammal Ecology and Conservation Field Course** for the first time this summer, and are thrilled to welcome back the **Broadreach Program's Marine Mammal Studies Course** for high school students as well.

Several volunteers will be joining us to help out during our fishing and harvesting season, and we will provide a home base for workers with our local salmon enhancement society (MESSS) during their summer **Stream Restoration** initiative and ongoing fall **Salmon Enumeration** program.

We may also continue our adult **Salmon Health Assessment** project in August, and host a pilot study looking into the **Effect of Boat Noise on Fish Behavior** – stay posted for details!



We will continue our Marine Mammal monitoring efforts this summer, and **invite visitors to the Broughtons to share marine mammal sightings and photos with us.**

We share our sightings database with the **BC Cetacean Sightings Network** and suitable ID photos are sent to local marine mammal experts to further our common research and conservation goals.