



Heiltsuk Sea Lice Monitoring Program: Report for Heiltsuk Council and Hemas - August 2007

The Heiltsuk Sea Lice Monitoring Program is a joint initiative between the Heiltsuk Nation and Raincoast Conservation Foundation, to motivate community involvement in a biological monitoring program within a salmon farm-free region.

Summary:

We successfully surveyed juvenile salmon for sea lice throughout Heiltsuk territory in collaboration with the Broughton Ecosystem Project. Two Heiltsuk community members were trained and employed for the duration of the season, contributing financial resources and acquired skills to the Heiltsuk community. We collected 2,071 juvenile salmon in 26 days, over eight rounds of sampling, between April and June. A total of 86 lice were identified (primarily *Caligus* spp.; a species not associated with salmon farms). Lice were found on roughly 4% of juvenile chum and pink; no lice were found on coho or sockeye. We consider 2007 the first year of a two-year project.

Successes:

The primary success of this year's study was the training of Heiltsuk members Harvey Brown and Mitch Clifton, to work the nets and capture juvenile salmon in accordance with our sampling methodology. Both individuals were reliable and hard working, with Mitch demonstrating exceptional commitment as crew leader to the project.

Another success of this year's study is the recent support by Fisheries and Oceans Canada (DFO) of our results, due to our collaboration with a much larger research initiative titled, The Broughton Ecosystem Project (BEP). BEP is focused on understanding the impacts of salmon farms on wild salmon in the Broughton Archipelago (east of Vancouver Island). Our research is considered an 'outgroup' within this larger project because the Bella Bella region is farm-free, and it is necessary to compare natural levels of sea lice to those near salmon farms. DFO has consistently challenged independent research results that have shown either high levels of lice on juveniles near farms, or few lice in farm-free areas. However, with DFO's support of this project, we hope that our results will clearly show the importance of keeping pristine areas, such as Bella Bella, free of fish farms.

Challenges:

The primary challenge of this year's project was the euthanization of juveniles for analysis. Euthanization and collection of juveniles has historically been the only method accepted by DFO for sea lice infection analysis. However, we believe the killing and collection of juvenile salmon must no longer occur, especially in the name of conservation. We are pleased to report a new 'live-sampling' method has been accepted by DFO recently, enabling next year's study to commence using a much less invasive technique.

The delayed onset of spring was another challenge we faced this year, as juvenile out-migration began later than usual. Although we visited numerous sites at the beginning of April, our collections did not begin until April 15th, and remained slow until the 1st of May.

Results:

We collected 2,071 juvenile salmon from 14 locations over 26 days on the central coast between April 17th and June 15st. Salinity and temperature readings were recorded at each location at depths 0, 2.5, 5, 7.5, and 10 meters. Of the 1,503 chum, 479 pink, 86 coho, and 2 sockeye, 86 lice (50 *Caligus* spp.; 36 *Lepeophtheirus salmonis*) were found (Table 1). Louse prevalence averaged 4.2%. Chum showed the highest rate of infection (4.5%), followed by pink (3.8%); no lice were found on coho or sockeye. Five juveniles (4 chum, 1 pink) hosted two lice each (i.e., Max Intensity = 2), and the remaining juveniles hosted a single louse or none. Louse prevalence remained low throughout the sampling period (Figure 1).

Table 1. Summary of juvenile salmon hosts and subsequent parasite prevalence identified during April to June 2007, among marine waters of Heiltsuk Territory on BC's central coast.

Species	No. of fish sampled	Total lice	Prevalence (%)	Lice/gram	Max Intensity
Chum	1,503	68	4.5	0.76	2
Pink	480	18	3.8	0.85	2
Coho	86	0	0	0	0
Sockeye	2	0	0	0	0
Total	2,071	86	4.2		2

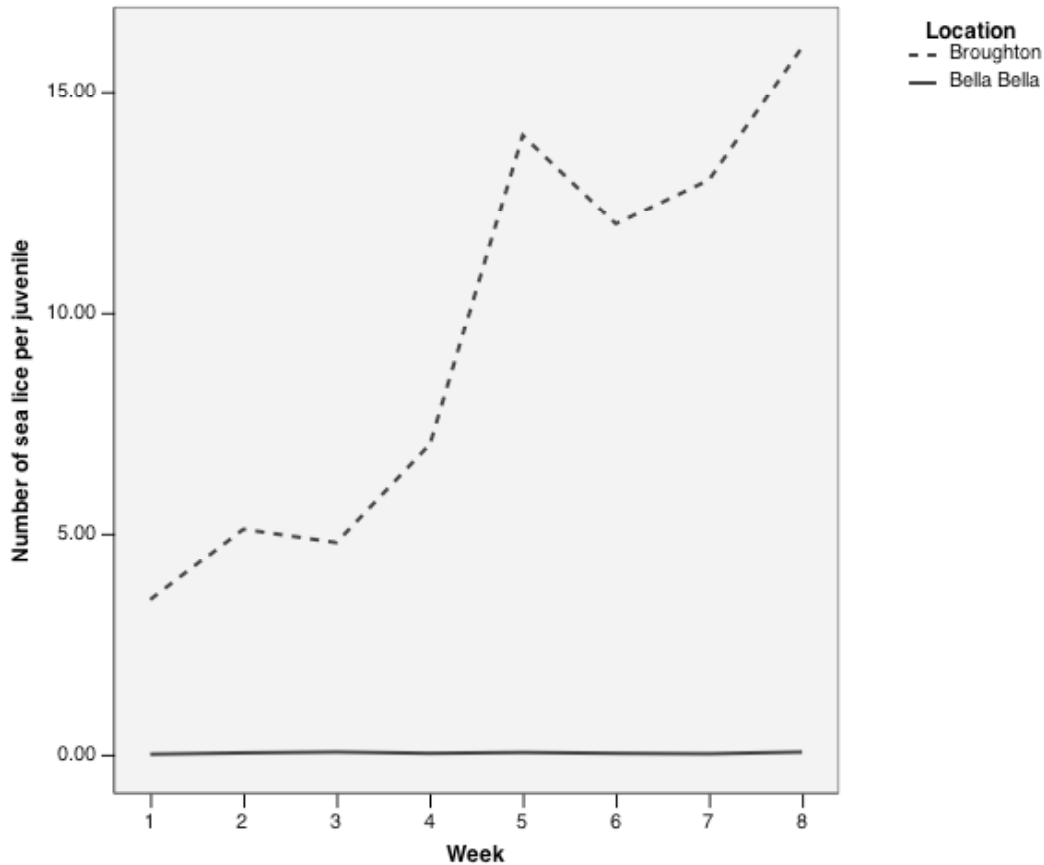


Figure 1. Average number of lice found on juvenile chum, pink, coho, and sockeye salmon over the 8-week sampling period (April to June 2007) among marine waters of Heiltsuk Territory, compared to the densely salmon-farmed Broughton Archipelago during 2004 (Morton et al. 2005).

Meeting Program Objectives:

1. *To assess the degree of lice loads on juvenile pink and chum salmon in Heiltsuk Traditional Territory where no salmon farms operate;*

Complete – 2,071 juvenile chum, pink, coho, and sockeye were collected using methodologies consistent with previous sampling years (Corey Peet study) to enable trend analyses over time. A total of 86 lice were identified on juveniles (primarily *Caligus clemensi*; a species not associated with salmon farms).

2. *To engage the Heiltsuk community in sea lice monitoring within their territory;*

Complete – Two community members (Harvey Brown and Mitch Clifton) were employed and trained during April to June, contributing financial resources and acquired skills to the Heiltsuk community.

3. *To add to the peer-reviewed scientific literature examining lice infestations between areas of varying proximity to salmon farms.*

Incomplete – Manuscript to follow pending completion of analyses.

Acknowledgements:

A kind thank-you is extended to the Heiltsuk Nation for granting us permission to study within your traditional territory. Thanks is also expressed to crew members Harvey Brown and Mitch Clifton, without whom this project would not have been successful, and to Hereditary Chiefs Harvey Humchitt and Gary Housty for their guidance.

References:

Morton, A., Rutledge, R.D, and Williams, R. 2005. Temporal patterns of sea louse infestation on wild Pacific salmon in relation to the fallowing of Atlantic salmon farms. *North American Journal of Fisheries Management* 25: 811-821.