Insights into Lumpfish (*Cyclopterus lumpus*) Diets: Combatting Salmon Lice (*Lepeophtheirus salmonis*) in Aquaculture

Kendra Leigh Gardner1, Elizabeth Grace Boulding2

1,2Integrative Biology, University of Guelph, Guelph

Salmon aquaculture becomes less profitable when salmon reared in sea cages become infested with ectoparasitic copepods called “sea lice”. The salmon louse (*Lepeophtheirus salmonis)* is the prominent species in Canadian Atlantic salmon farms in Newfoundland and can significantly reduce production and cause salmon welfare issues. Lumpfish (*Cyclopterus lumpus*) are commonly used as a biological control agent for sea lice in cold-water environments. However, lumpfish are highly opportunistic generalist feeders that will forage on non-target food items. Jessica Roy’s research analyzing lumpfish diets from Newfoundland salmon farms revealed notable variances in diet composition between 2018 and 2020, confirmed by DNA metabarcoding. However, differences in farm locations and sampling methods necessitate further investigate to ascertain consistent trends. My study aims to assess the relationship between diet composition and lumpfish cleaning efficacy as a function of size within Atlantic salmon sea cages using morphological species identification and DNA metabarcoding. My hypothesis is that smaller lumpfish will eat more sea lice because their smaller mouth prevents them from eating large non-target prey items - such as krill and formulated pellets designed for salmon. My research will provide insight in the delousing efficacy of lumpfish of different sizes when used in Atlantic Canada.