

**Decoupling of otolith and somatic growth during migration of northern form Dolly Varden (*Salvelinus malma malma*)**

Kimberly Howland, Christie Morrison, Colin Gallagher, and Keith Tierney

**Abstract**

Northern Dolly Varden char (*Salvelinus malma malma*), which utilize coastal and stream habitats in the Canadian Arctic, are listed as special concern by the Committee on the Status of Endangered Wildlife in Canada due to their limited distribution, population declines, and concerns over their ability to tolerate climate change. Research to date has been focussed on the anadromous life history form which feeds in coastal areas; information on resident Dolly Varden and their overall role in populations is unknown, despite the fact that the two forms are genetically the same within different spawning/overwintering rivers. Our research is comparing resident and anadromous life history strategies across river systems and among cohorts within systems to identify factors that contribute to selection of different life history trajectories. More specifically, we are examining early growth rates and associated traits of resident and anadromous individuals. Otoliths are being analyzed to determine ages and growth rates, while analyses of otolith strontium concentration are being used to determine age at seaward migration of anadromous individuals; analysis of carbon ratios will be used to infer metabolic rates. Preliminary results indicate that growth rates among forms diverge early in the life history prior to first migration and that age at first seaward migration differs among rivers systems. River-specific differences in life histories may be influenced by migration distance, and/or freshwater growth opportunities. The results of this study will aid in management efforts for northern Dolly Varden and enhance the overall understanding of life history strategies within this species.

**Keywords:** life history, growth, otolith microchemistry, char, anadromous, resident

**Contact Author:** Kimberly Howland, Fisheries and Oceans Canada, 501 University Crescent, Winnipeg, Manitoba, Canada; email: kimberly.howland@dfo-mpo.gc.ca;