Overwintering Patterns of Dolly Varden *Salvelinus malma* in the Sagavanirktok River in the Alaskan North Slope Inferred Using Mixed-Stock Analysis

Abstract

Tagging data from previous studies indicate that anadromous Dolly Varden *Salvelinus malma* in the North Slope of Alaska use their natal drainage for both spawning and overwintering. This differs from other regions of the state where Dolly Varden overwinter in mixtures comprising stocks from multiple drainages. We used mixed-stock analysis to estimate the origin of overwintering Dolly Varden sampled from the Ivishak River, a tributary of the Sagavanirktok River, which drains into the Beaufort Sea. Our objective was to use mixed-stock analysis to test whether Dolly Varden show philopatry to their natal drainage to overwinter, as suggested by tagging data, and to determine if the extent of mixing differs between two maturity/size classes. We assayed genetic variation at seven microsatellite loci in 10 populations from six drainages on the North Slope and used these data to estimate the contribution of North Slope drainages to

predominantly immature (200-400mm FL) and predominantly mature (>400mm FL) Dolly Varden. Our results indicate that mature fish comprise Dolly Varden originating from the Sagavanirktok drainage, but that 10% of the immature sample originated from the Canning River and 4% from the Anaktuvuk River. These data support previous tagging studies indicating interdrainage exchange in Dolly Varden for overwintering is rare, and underscore the importance of natal drainages for all freshwater life history stages for Dolly Varden in North Slope streams.

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