Presentation Title: Cross−Species Spawner−Recruit Analysis at Ford Arm Creek

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The coho salmon population in Ford Arm Creek in Southeast Alaska was studied as an indicator stock for fishery management during 1980−2009. A doubling of the average adult return between 1982−1991 and 1992−2009 resulted from a 48% increase in average presmolt production and a 37% increase in average presmolt-adult survival. The increase in freshwater production occurred concurrent with a quadrupling of both average pink salmon spawner abundance and average all-species carcass biomass. Relationships were explored using independent variables that included the pink salmon peak escapement survey count and total MDN loading in the common brood year, the following year, and an average for both years, with the average for both years producing the best statistical fit with coho salmon production. Average pink salmon escapement in the coho brood year and the following year explained 58% of variation in the survival-adjusted return of coho salmon. A logistic hockey stick model predicts an increase of 127% in the coho salmon return as pink salmon escapement increases from zero to an inflection point at a peak count of 79 thousand spawners, with a further 18% increase in coho production to a nominal saturation point at 116 thousand pink salmon spawners, above which further response was nil. Both reference points fall within the current pink salmon escapement goal of 48−156 thousand spawners, established using single-species yield analysis. On an area-density basis, the relationship between MDN and coho salmon production in Ford Arm Creek was consistent with the observed growth response by coho salmon fry to the addition of pink salmon carcasses reported from other research based on a controlled experiment in an artificial stream. These observations further support inter-species relationships and the response to MDN as important considerations in setting escapement goals for salmon. Evidence suggests that steelhead production may also benefit from an increase in MDN derived from higher pink salmon escapement levels.