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TITLE: OPTIMIZATION OF YIELD OF CHINOOK SALMON IN THE ALASKA TROLL FISHERY: A MODEL FOR EVALUATION OF THE EFFECTS OF SIZE LIMITS, GEAR REQUIREMENTS AND TIME-AREA CLOSURES

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ABSTRACT: Size limits for individual fish of a returning population have been used as a means as maximizing the yield in weight from a given number of recruits at a given rate of fishing mortality. However the survival of released undersize fish comes to bear. In fact, hooking mortality of undersize fish can cause a wasteage that exceeds gains in yield due to growth and capture at older ages. In this thesis yield-per-recruit models which consider natural mortality with age, differential growth rates of groups of chinook salmon and changes in hooking mortality with fish size are investigated to determine the value of yield-per-recruit to the fisherman. The role of using trolling gear which reduces the mortality of hooked undersized fish is evaluated as a gear restriction. Further, benefits resulting from time-area closure schemes are discussed.

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