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USE OF SIMULATION ANALYSES TO INVESTIGATE YELLOWFIN TUNA (*THUNNUS ALBACARES*) GROWTH MODELS IN THE ATLANTIC OCEAN INCORPORATING GEAR SELECTIVITY

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The growth rate of a fish is a fundamental component used in stock assessments to help determine the population size and the fishery pressure affecting the species. There has been recent debate within the stock assessment community regarding which type of growth model best represents the true growth rate of yellowfin tuna (*Thunnus albacares*) in the Atlantic Ocean; specifically, whether assessments done by the International Convention for the Conservation of Atlantic Tunas (ICCAT) should use a traditional von Bertalanffy growth curve or a so-called “two-stanza” growth curve, which has one growth rate for smaller individual tuna and another for larger sizes. Currently, ICCAT uses an age-structured virtual population analysis (VPA) for the stock assessment and assumes a two-stanza growth curve. Using a simulated population based on known biological parameters obtained by ICCAT from the stock in the Atlantic Ocean, and the Stock Synthesis 3 program available through the National Oceanic and Atmospheric Administration (NOAA), the simulated yellowfin tuna population is compared within each model in order to determine the merits of each growth rate assumption. In addition, gear selectivity during fishing operations often affects the length composition data from fisheries dependent sources, namely commercial fishermen. The simulated population is therefore also used to determine the effects of different gear selectivity on the growth rates within each of the growth models. Pelagic longline will be used for one gear type and purse seine and bait boat will be used for a second gear type.