EVALUATION OF THE CAPACITY FOR COMPENSATORY GROWTH IN JUVENILE BLACK SEA BASS (*Centropristis striata*) AND SOUTHERN FLOUNDER (*Paralichthys lethostigma*)

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ABSTRACT

Compensatory growth (CG) refers to the ability of individuals to accelerate growth rate following periods of nutritional deprivation. This study examined the use of cyclical feeding regimes to elicit CG in two marine fishes with different life histories: black sea bass (*Centropristis striata*) and southern flounder (*Paralichthys lethostigma*). During Phase I, 60 juveniles of each species were divided equally into 3 cyclical feeding treatments and one control group (unlimited ration). There also was a group control for each species to test for any differences between the group held and the individually held controls. Treatment groups were starved for either 2, 5 or 8 days, refed until consumption rates returned to control levels, and then starved again. During Phase I, treatments were examined for their ability to elicit CG after at least 3 feed/no feed cycles. During Phase II, deprived treatments were returned to unlimited ration and monitored for additional compensation relative to controls. The duration of the experiments was 73 days for black sea bass and 61 days for southern flounder. Analyses indicate that capacity for CG is minimal in both species. Following Phase I, controls were larger than deprived treatments for both species, suggesting that cyclical feeding regimes did not elicit a strong compensatory response. Although cyclical feeding produced a hyperphagic response in both species, the duration of hyperphagia was short (~1-2 days) and insufficient to support CG. Furthermore, treatment groups did not increase growth efficiencies relative to controls during Phase I. During Phase II, D5 and D8 treatments displayed partial compensation as evidenced by increased weight-specific feeding rate (WSFR), growth rate (G) and gross growth efficiency (K_1); however, control fish maintained a distinct size advantage. Proximate composition analysis (non-polar lipids,

protein, AFDW) reveal different patterns of energy allocation in these species, with the black sea bass showing higher lipid content and lower water content compared to the southern flounder. Results are discussed in light of competing hypotheses regarding the fitness consequences of compensatory growth. Limited hyperphagic responses and lack of full compensation may be due to constraints on digestion rate, or decreased fitness associated with maximal growth rates.

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DEDICATION

This thesis is for my family, whose unconditional love and encouragement have made it possible for me to come this far in life.

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