CATCH-AND-RELEASE STRESS: IMPACTS ON THE ENDOCRINE PHYSIOLOGY OF THE CALIFORNIA SHEEPHEAD, *SEMICOSSYPHUS PULCHER*

A THESIS

Presented to the Department of Biological Sciences
California State University, Long Beach

In Partial Fulfillment
of the Requirements for the Degree
Master of Science in Biology

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August 2004

ABSTRACT

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A catch-and-release policy was implemented several years ago by the state of California for undersized (≤ 30.5 cm TL) California sheephead, *Semicossyphus pulcher*, with the objective of reducing impacts of fishing pressures on this economically important species. Such harvest control measures are utilized by all U.S. states and across the globe to protect fisheries. It has not yet been established, however, whether the stress associated with catching and releasing has subsequent deleterious effects. The impacts of catch-associated stressors on the endocrine physiology of *S. pulcher* were therefore examined, with an emphasis on how metabolism and growth may be altered. *S. pulcher* were caught offshore near Santa Catalina Island using standard hook and line or commercial trapping. Controls (baseline) consisted of fish blood sampled within 3 min of initial disturbance, which included catching and rapid retrieval to the surface as well as catching directly underwater while diving. Fish were subjected to the following stress-inducing protocols: 1) increasing angling fight times up to 20 min, 2) line-catching and confinement in tanks for 10 min to 30 d, 3) trap-catching with up to 5 h soak times,

and 4) catching, releasing to the environment for varying periods, and then sampling of recaptured fish. In all experiments, plasma cortisol concentrations increased significantly and often dramatically in response to catch-associated experiences, in a manner commensurate with the time and intensity of the treatments. Sustained increases in plasma glucose followed the elevations in cortisol, while increases in lactate were more transitory. Plasma levels of a putative growth-inhibitory protein (IGFBP) were elevated in stressed fish, along with alterations in IGF-I concentrations, yet no differences in plasma IGF bioactivity were detected in these experiments. This thesis research demonstrates that captured *S. pulcher* experience a profound stress response with associated metabolic impacts, while effects on growth regulatory factors are complex and not yet understood.

SEA GRANT ACKNOWLEDGMENT

This research was supported through the NSF Grants IBN-9670083 and IBN-0115975. This publication was supported in part by the National Sea Grant College Program of the US Department of Commerce's National Oceanic and Atmospheric Administration under NOAA Grant # NOAA NA06RG0142 2001-2002, project # R/F-192, through the California Sea Grant College Program; and in part by the California State Resources Agency. The views expressed herein do no necessarily reflect the views of any of these organizations.