

Project: R/CZ-189

## California Sea Grant Final Report

A field experimental investigation of the effects of black brant geese grazing on eelgrass growth and the animals in an eelgrass bed

Dr. Frank J. Shaughnessy (Department of Biological Sciences, Humboldt State University)

Dr. Jeffrey M. Black (Department of Wildlife, Humboldt State University)

Mr. Adam J. Frimodig (Trainee; currently with CA Fish & Game, Eureka, CA)\*

Ms. Susannah Ferson (Trainee)\*

(\* Graduated from HSU with Master's degree)

### Introduction

Eelgrass (*Zostera marina*) beds and other seagrass ecosystems around the world are recognized for their trophic support, nursery, refuge, water quality and recreational functions (Williams and Heck 2001). Given that so many seagrass beds have been and are being stressed by anthropogenic activities such as suspended sediment and/or nutrient loading, both of which attenuate light, it is not surprising that management has focused on these bottom-up regulating mechanisms (Kenworthy et al. 2006, Orth et al. 2006). However, this focus is incomplete since it does not consider the potential top-down effects of herbivores on these ecosystem functions. Invertebrates can increase the light reaching seagrass leaves by grazing off algal epiphytes, and depending upon the intensity of grazing, various vertebrate grazers have been demonstrated to increase or decrease seagrass productivity, and to change the structure of the seagrass vegetation (Van Montfrans et al. 1984, Valentine and Heck 1991, Jernakoff et al. 1996, Cebrian et al. 1998).