NEIGHBOURS AT WAR: AGGRESSIVE BEHAVIOUR AND SPATIAL RESPONSIVENESS IN THE ANEMONE, ACTINIA TENEBROSA.

This thesis is completed in part of a Masters of Conservation Biology Degree.

Georgia Balfour | Masters of Conservation Biology | July 27, 2017

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"Ehara taku toa it te toa takitahi, engari he toa takimano.
My success is not that of my own, but the success of many"

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GENERAL ABSTRACT:

Habitable space is precious and animals have developed a wide variety of mechanisms to acquire and defend favourable space. Aggression is considered any animal behaviour that involves actual or potential harm to another animal of either the same or different species. Agonistic behaviours must also be considered as it is any social behaviour related to fighting. Both aggressive and agnostic behaviours are observed in many animal species as resources including light exposure, nutrients and mates are often limited. Although agonistic behaviour varies among species, agonistic interactions can be partitioned into three specific types of behaviours: threat, aggression, and submission or avoidance. While any one of these behaviours can be observed in isolation, in an interaction between two animals, there is normally a sequence of behaviours which can culminate in combat. Anemones have unique adaptions such as clubs, fighting tentacles, bundles of stinging cells, sweeper tentacles and acrorhagi that allow them to defend themselves from competitors. Previous research also suggests that anemone populations are a collection of clusters of genetically similar which assemble via limited dispersal and locomotion. I chapter two I examined the effect of aggression on individuals at varying distances and predicted that those anemones that are initially located in closest proximity (<1 centimetre) in the field will be less aggressive towards each other than those anemones found further way from each other. Overall, my results suggest that *Actinia tenebrosa* have an obvious sequence of aggressive behaviours, and that indeed, aggressive behaviours were less common and less severe between nearest neighbours than among individuals sampled at greater distances. My results also show that aggressive behaviours are typically only expressed when individuals are within close proximity of each other <10cm. This behaviour is important to understand as it aids in fully understanding how aggressive behaviours determine dominance hierarchies and the spatial arrangement in *A. tenebrosa*. I chapter three, I investigated whether there was evidence for an ideal spatial arrangement of individuals in the field by testing whether individuals return to a similar spatial arrangement if randomised. The results from this chapter suggest that there is no single ideal spatial arrangement of individuals but rather individuals will find a spatial arrangement that is stable. I also observed that there appears to be an acclimation between individuals that resulted in a favourable position within the cluster. Lastly, I observed that

instead of trying to return to a specific aggregation, individuals acclimate each other and move relative to those individuals surrounding them, much like stars in the sky. The results from this study would suggest that spatial structure of individuals in the field is dependent on intraspecies interactions and the recognition of individuals.

TABLE OF CONTENTS:

TABLE OF FIGURES: