

# **Territorial Habits of *Stegastes fuscus***

**By: Megan Pugh**

**Dominica 2005  
Dr. Bob Wharton and Dr. Anthony Cognato  
Texas A&M University**

## **Abstract**

The purpose of this project was to go out to Rodney's Rock and observe the territorial habits of the dusky damselfish (*Stegastes fuscus*). There were many different fish that were chased out of an area that the dusky damselfish defended while some were ignored. It is believed that the dusky damselfish chases away intruders in order to protect its food resources.

## **Introduction**

The dusky damselfish (*Stegastes fuscus*) is a fish in the family Pomacentridae that can commonly be seen in and around the coral of Rodney's Rock on the West coast of the island of Dominica. Rodney's Rock is a great area to snorkel to see a wide variety of reef creatures which makes it a great environment to view the dusky damselfish's tendencies to be territorial.

The dusky damselfish is a "dark olive-brown to almost black" fish with "faint dark bands" on its body. It grows a maximum of six inches in length and can be seen chasing fish two to three times its size. It eats algae and inhabits coral and rocky areas where it will "pugnaciously chase away intruders."

This project is designed to analyze the territorial habits of the dusky damselfish. The purpose is to determine how large the dusky damselfish's territory is and which species of fish it will or will not chase when one intrudes its territory.

## **Methods and Materials**

Observations were made at Rodney's Rock on four separate occasions. The first day was used to snorkel around the rock to find the best location for studying the dusky damselfish's territorial habits.

On the next trip out to Rodney's Rock a square meter grid and flagging tape were used. The flagging tape was tied to various points on the grid to mark the outermost points at which the dusky damselfish traveled to for feeding as well as chasing away intruders. An underwater tablet was used to record which species the damselfish would chase away and which ones it would ignore. The dusky damselfish's territory was measured with the meter grid after leaving the beach by running a string

through each point where the flagging tape was tied. Once the length of the string was found, it was shaped into a rectangle and the two sides were measured then multiplied to determine the area in square centimeters which were then converted to square meters.

On the third day for observations an underwater tablet was used to record which species the dusky damselfish would chase and the species of fish it would ignore.

The fourth trip to Rodney's Rock was to examine how often a chased fish would enter the dusky damselfish's territory and how often one would enter its territory that it would ignore and was recorded on an underwater tablet.

## **Results**

The size of the dusky damselfish's territory observed was .4514 m<sup>2</sup>.

Table 1 shows which fish were consistently chased versus which fish were consistently ignored.

Table 2 represents the last day of observations in which actual numbers of fish chased versus fish ignored were recorded.

Table 3 shows the feeding habits of each fish chased or ignored based on information obtained from the websites listed in the references section.

## **Discussion**

The research conducted at Rodney's Rock shows that the dusky damselfish is indeed territorial. The dusky damselfish was seen actively chasing other fish out of its .4514 m<sup>2</sup> territory on four separate occasions. In table 1 all of the fish that were seen chased by the dusky damselfish are mentioned as well as the fish that were ignored. I must add that some of these fish it chased more aggressively than others. The dusky damselfish would sometimes chase the smallmouth grunt, sergeant major, and bluehead wrasse. However, it would pursue the bicolor damselfish, ocean surgeonfish, and blue tang without hesitation. Table 2 represents one day of observations in which the number of fish that entered the dusky damselfish's territory were counted and recorded on how often they were chased or ignored. This represents how many of each type of fish would continue to intrude whether the dusky damselfish

would chase it away or not. There is a higher number of bluehead wrasse juveniles recorded because they swim in groups.

In order to come to the conclusion of why the dusky damselfish would chase some but not all of the fish that entered its territory, I researched each species recorded in order to find out what their feeding habits are. I got the idea to do this from the dusky damselfish research project by Anderson et al. (2001). Table 3 represents these data and shows that most of the fish in the chased column feed on algae or the benthic invertebrates that can be found in the algae. The fish that the dusky damselfish chased more aggressively are known to eat algae, such as the blue tang, rock beauty, ocean surgeonfish, and the bicolor damselfish. The fish that I noticed the dusky damselfish chase but show some tolerance toward, such as the bluehead wrasse, smallmouth grunt, and sergeant major, are known to eat things other than algae but may still pick at the algae in order to find their food source. For instance, the bluehead wrasse is known to eat benthic invertebrates which live in the algae, so they may not be as big a concern for the dusky damselfish as the ocean surgeonfish is that actually eats the dusky damselfish's algae. Table 3 also shows that the fish the dusky damselfish would ignore mostly ate small animals and not algae, such as the trumpetfish. The redlip blenny, checkered puffer fish and orangespotted filefish on the other hand, look as though they should fit into the chased category since they too eat algae and or benthic invertebrates. The redlip blenny is also a very territorial fish which may be why the dusky damselfish chose to ignore them. The checkered puffer fish was seen wedged under a rock in the dusky damselfish's territory, and it approached the puffer once then seemed to forget its presence in the area. I believe this is because the puffer fish was wedged nicely under a rock with no where to chase it. As for the orangespotted filefish, at Rodney's Rock the dusky damselfish appeared to ignore it, but when snorkeling at Scottshead, I noticed a dusky damselfish aggressively chasing one away. I feel that I may have not had the opportunity to observe this due to our limited amount of time for research at Rodney's Rock. The results show that the dusky damselfish is territorial because it is protecting its food source from competitors. It is a solitary fish

that will even chase away other dusky damselfish to ensure that it will maintain an adequate food source.

There are two things I would do differently in order to better my research on this project. I would have began counting how often the dusky damselfish chased or ignored other fish that entered its territory sooner rather than only count on the last day. I also would have liked to have had more time to do more extensive research. Unfortunately we are in Dominica for a short period of time and more time at Rodney's Rock may not have been possible.

### **Acknowledgements**

I would like to thank Dr. Wharton for his time, advice and patience. I learned a lot from this project and couldn't have done it without his guidance.

### **References**

Anderson, Luke; Stanford, Mandy; Weems, Jessica. 2001 Interspecific Competition of *Stegastes fuscus*. Texas A&M Study Abroad Program. Group Project Report.

Humann, Paul. 1999. *Reef Fish Identification: Florida, Caribbean, Bahamas*. Jacksonville, Florida: New World Publication, Inc.

"Rock and Wreck Fishes of North Carolina." Accessed June 10th, 2005.

<http://core.ecu.edu/biol/nortons/NCFishes>

Florida Museum of Natural History. "Ichthyology at the Florida Museum of Natural History." Accessed June 10<sup>th</sup>, 2005. <http://www.flmnh.ufl.edu/fish/default.htm>

California State University, Long Beach. "California State University, Long Beach Biological Sciences." Accessed June 10<sup>th</sup>, 2005. <http://www.csulb.edu/depts/biology/marine/species>

Fenner, Robert. "Wetwebmedia, Aquariums, Fish and Aquatic Information." Accessed June 10<sup>th</sup>, 2005. <http://www.wetwebmedia.com>

**Table 1**  
**Fish Chased versus Fish Ignored in the Dusky Damselfish's Territory**

<b>Fish Chased</b>	<b>Fish Ignored</b>
Bluehead Wrasse ( <i>Thalassoma bifasciatum</i> )	Trumpetfish ( <i>Aulostomus maculatus</i> )
Yellowtail Damselfish ( <i>Microspathodon chrysurus</i> )	Redlip Blenny ( <i>Ophioblennius atlanticus</i> )
Bicolor Damselfish ( <i>Stegastes partitus</i> )	Checkered Puffer Fish ( <i>Sphoeroides testudineus</i> )
Ocean Surgeonfish ( <i>Acanthurus bahianus</i> )	Blackbar Soldierfish ( <i>Myripristis jacobus</i> )
Rock Beauty ( <i>Holocanthus tricolor</i> )	Orangespotted Filefish ( <i>Cantherhines pullus</i> )
Red Porgy ( <i>Pagrus pagrus</i> )	French Grunt ( <i>Haemulon flavolineatum</i> )
Slippery Dick ( <i>Halichoeres bivittatus</i> )	
Sergeant Major ( <i>Abudefduf saxatilis</i> )	
Blue Tang ( <i>Acanthurus coeruleus</i> )	
Smallmouth Grunt ( <i>Haemulon chrysargyreum</i> )	
Dusky Damselfish ( <i>Stegastes fuscus</i> )	

**Table 2**  
**Number of Fish Chased versus Fish Ignored in One Day of Observations**

<b># of Fish</b>	<b>Fish Chased</b>	<b># of Fish</b>	<b>Fish Ignored</b>
1	Bluehead Wrasse Adult	3	French Grunt
12	Bluehead Wrasse Juvenile	2	Redlip Blenny
3	Slippery Dick	1	Trumpetfish
3	Ocean Surgeonfish	1	Blackbar Soldierfish
1	Yellowtail Damselfish		
3	Red Porgy		
3	Sergeant Major		
4	Bicolor Damselfish		
1	Dusky Damselfish		
1	Blue Tang		

**Table 3**  
**Feeding Habits of Fish Chased versus Fish Ignored in the Dusky Damselfish's Territory**

<b>Fish Chased</b>	<b>Feeding Habits of Fish Chased</b>	<b>Fish Ignored</b>	<b>Feeding Habits of Fish Ignored</b>
Bluehead Wrasse	benthic invertebrates	Trumpetfish	small animals, crabs, fish
Yellowtail Damselfish	algae	Redlip Blenny	algae
Bicolor Damselfish	benthic invertebrates, algae	Checkered Puffer Fish	invertebrates, algae
Ocean Surgeonfish	algae	Blackbar Soldierfish	small fish, invertebrates
Rock Beauty	algae	Orangespotted Filefish	benthic invertebrates, algae
Red Porgy	benthic invertebrates	French Grunt	mollusks, crustaceans
Slippery Dick	benthic invertebrates		
Sergeant Major	plankton found in coral		
Blue Tang	algae		
Smallmouth Grunt	shrimp		
Dusky Damselfish	algae		