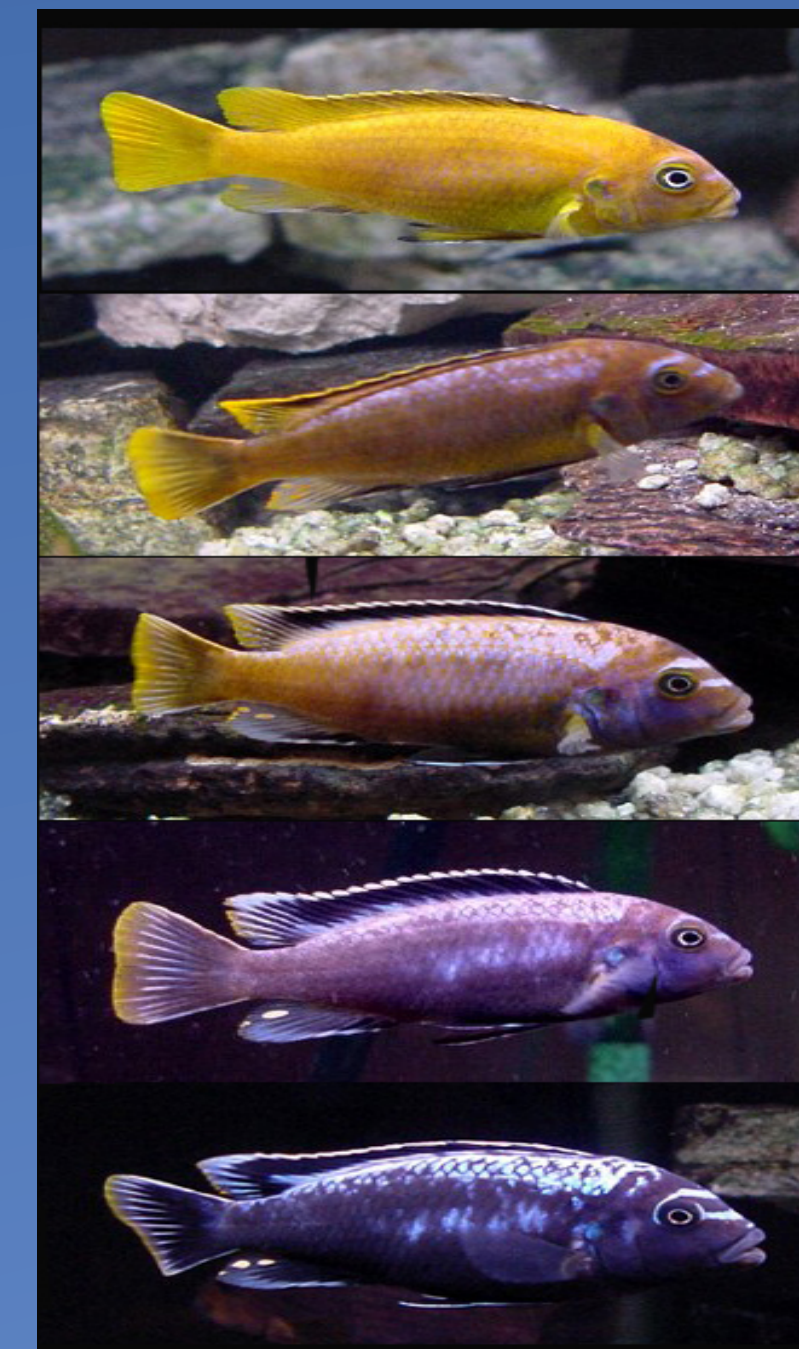


# Utilizing a Community Cichlid Fish Tank for Animal Behavior Studies

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## Abstract

A large 100 gallon fish tank, prominently placed in a public place on display at St. Francis College, has served as a unique opportunity for our students to study animal behavior using cichlids. The tank can be partitioned into three viewing regions using vertical stripes of clear adhesive tape. Students can, using timers, view the movement of the fish, one fish at a time. They can record each time a fish moves into a different partition. They might find that some fish are more territorial than others. Separate smaller ten-gallon tanks can then be set up to house individual cichlids. Fish A was introduced into a tank with Fish B, only to see Fish B chase and bite Fish A. The experiment was repeated, but Fish A did not even attempt to face Fish B; it only exhibited avoidance behavior. The reverse experiment was attempted a few days later, in which Fish B was introduced into a tank with Fish A, who became the new aggressor. The fish also changed colors, and their stripes became more prominent. This type of project was an excellent example of the process of science, in which one experiment generated interest in these fish, and prompted many new ideas for future projects.



[http://www.malawinayhem.com/articles\\_msobo.shtml](http://www.malawinayhem.com/articles_msobo.shtml)

## Introduction

Cichlids are fish that are found in the family *Cichlidae* in the order *Perciformes*. At least 1,600 species have been identified in Africa and South America, making this one of the largest families of chordates or vertebrates and new species are discovered annually. Some believe that the numbers of undiscovered fish species range from 1,300 to over 3,000. The fish in our tank were originally found in the lakes of Central Africa. Geological data shows that Lake Victoria (one of the central African lakes) was completely dry during the most recent ice age, that is 12,000 years ago. Now the lake hosts over 500 cichlid species. Sexual selection could have been the driving force of this rapid speciation. The mate choices of females for differently colored males maintains reproductive isolation between species of the same community. Color morphing for some species such as the *A. burtoni* is a confirmed behavioral strategy. Territorial aggressive males have a bluish hue, while timid passive males are cryptically colored, and have repressed gonads. Males of that same species switch between these social states depending on their success in aggressive encounters.



## Observing Territorial Behaviors of African Cichlids

Two 10 gallon tanks were set up and kept at 23 degrees Celsius or 75 degree Fahrenheit. We obtained two maulana peacock cichlids from the school aquarium and kept them in separate tanks. Each tank and cichlid was labeled A and B. The cichlids were left in their tanks for a few days to establish their territory. We observed that when the cichlids territory is not under threat, their facial coloring is about the same, their body is orange and stripes are not distinct and their dorsal fins are raised midway.



Fish A



Fish B

We introduced cichlid A into tank B and after a few minutes the subordinate male is taken out before being put back in again. The same procedure was done with cichlid B into tank A. When the cichlids territory is threatened, its stripes will become darker and more distinct. Both cichlids will begin to circle around each other and open their mouths as wide as possible to scare the other one off. Their dorsal fins will also be raised all the way up. When we introduced cichlid A into tank B cichlid B successfully defended its territory and vice versa. During the second confrontation the dominant male will have a brighter coloration than the subordinate male and the subordinate male will then lower its dorsal fin and attempt to retreat. One factor that could have kept the subordinate male from taking over the other's territory is that we did not give enough time for the male to become familiarized with its surroundings.

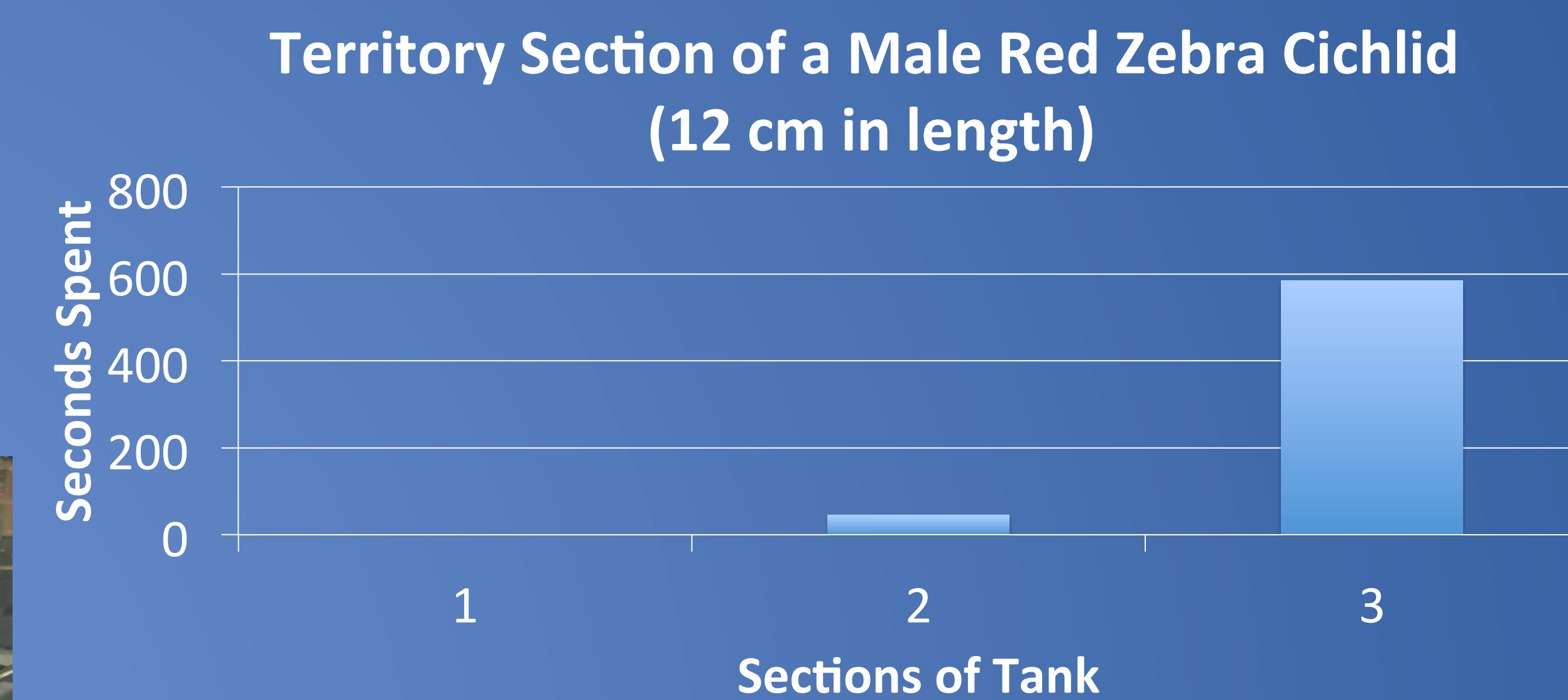
## Conclusion

Cichlids are resilient organisms that are able to interact with one another as well as adapt to new environments. Subordinate males are able to establish their territory when a dominant male is absent as well as change their social ranking in the past and present. By studying cichlid behavior we are able to see how complex these organisms are from the way they behave and process information.

## Observing the Territories of African Cichlids

Observations were made in a large 500 gallon aquarium. We observed various species of male cichlids in the aquarium including the red zebra cichlid, maulana peacock cichlid and albino brichardi cichlid. We divided the aquarium into three sections with tape and observed the area and depth in which each cichlid spends most of its time. We observed that the cichlids are territorial and stay in a certain area. The only time they would go into another area is when a larger male chased them away.

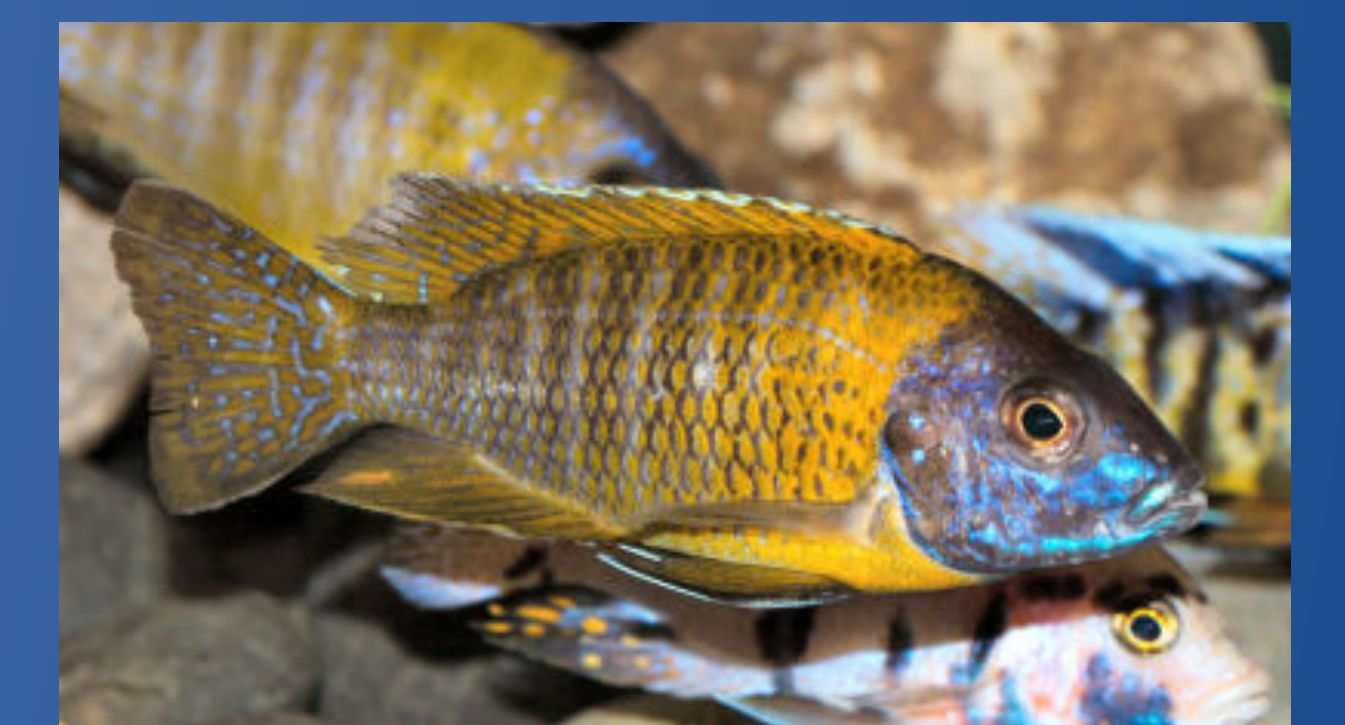
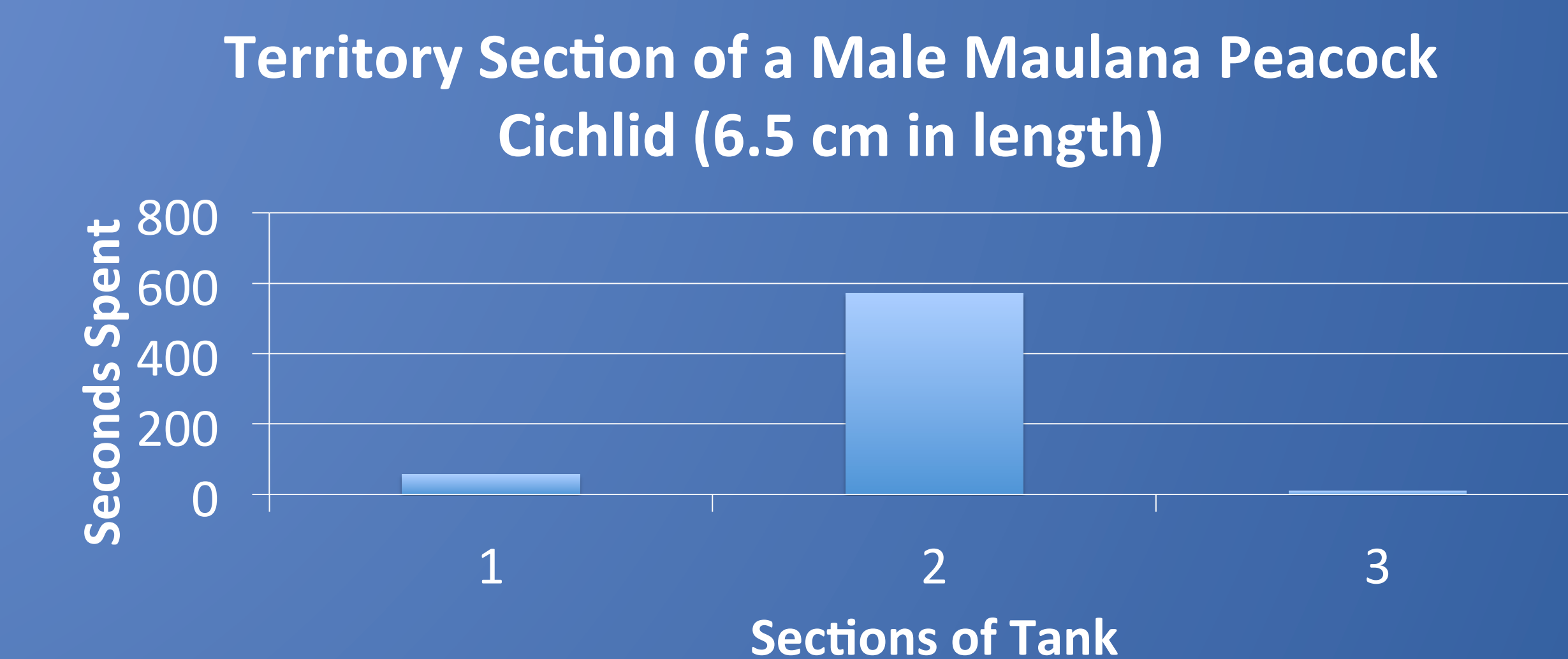
### Red Zebra (*Pseudotropheus Estherae*) Lake Malawi



[http://animal-world.com/encyclo/fresh/cichlid/images/redzebra\(male\)WFCaf\\_Ap188M.jpg](http://animal-world.com/encyclo/fresh/cichlid/images/redzebra(male)WFCaf_Ap188M.jpg)

Figure 1: The red zebra (male) cichlid's territory is in section 3 at the bottom of the tank.

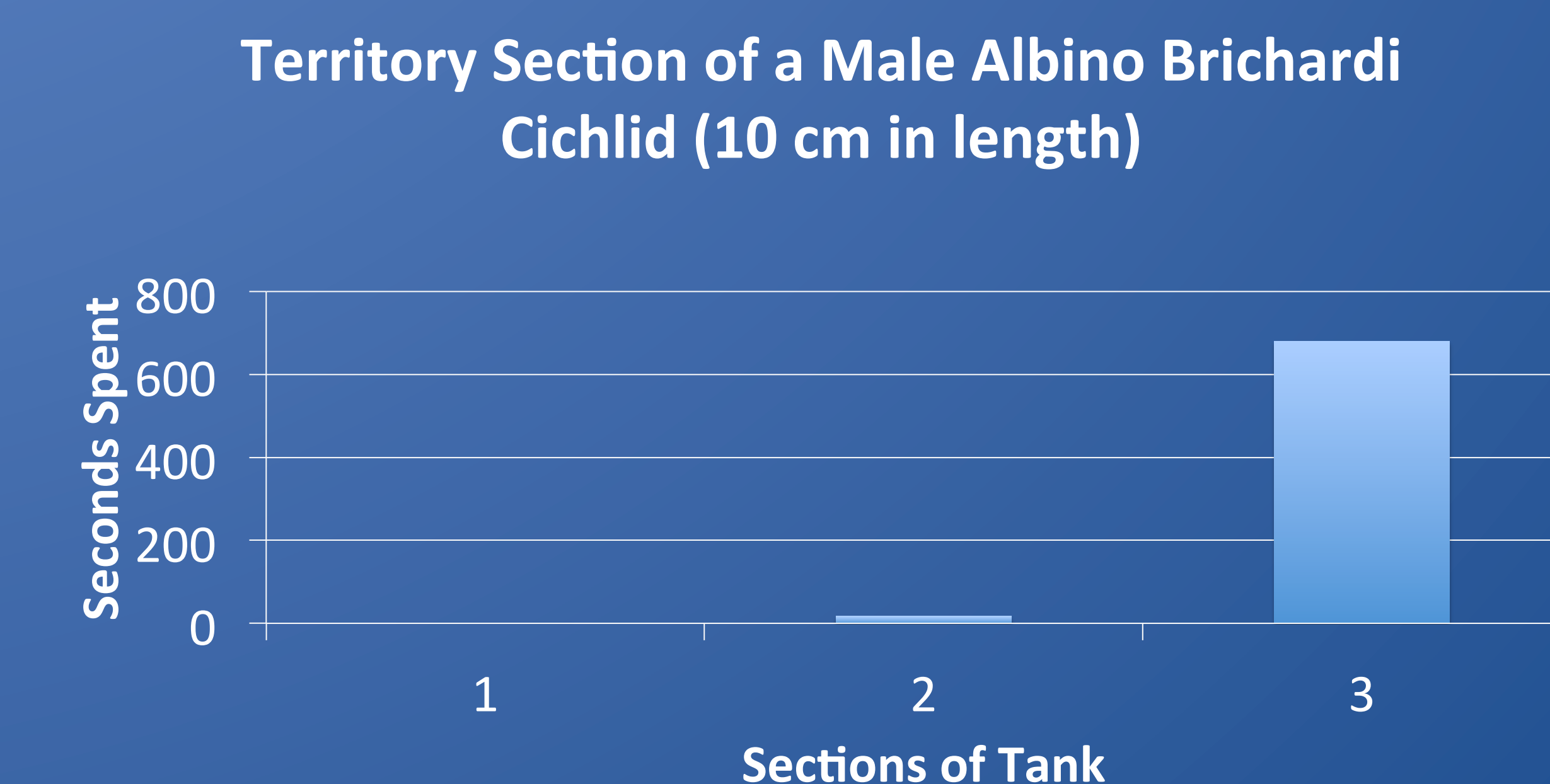
### Maulana Peacock (*Aulonocara stuartgranti*) Lake Malawi



<http://animal-world.com/encyclo/fresh/cichlid/MaulanaBicolorPeacock.php>

Figure 2: The Maulana Peacock (male) cichlid's territory is in section 2 at the bottom of the tank.

### Albino Brichardi (*Neolamprologus brichardi*) Lake Tanganyika



[http://www.cichlids.com/uploads/tx\\_usercichlids/user\\_pic/5484/01\\_f1008802.JPG](http://www.cichlids.com/uploads/tx_usercichlids/user_pic/5484/01_f1008802.JPG)

Figure 3: The Albino Brichardi (male) cichlid's territory is in section 3 at the top of the tank.