



**CALIFORNIA STATE SCIENCE FAIR  
2005 PROJECT SUMMARY**

<b>Name(s)</b> <b>Chrystine E. Bourbina</b>	<b>Project Number</b> <b>S1902</b>
<b>Project Title</b> <b>Light Intensity Effect on Tilapia Behavior in the California High Desert</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The behavior of the <i>Oreochromis mossambicus</i> #Mozambique Tilapia# will be compared against individual light intensity variables to determine if variations in light levels causes any increase in fish activity. Any additional fish activity caused by increased light levels may hinder growth rates or increase fish stress. Unaffected fish will exhibit a limited amount of movement allowing for more preservation of bodily mass, which is one of the main goals in maintaining a successful aquaculture project. If a tilapia exhibits a set amount of activity while exposed to sunlight (ambient), then an application of additional light should not cause any corresponding increase in fish activity. <b>Methods/Materials</b> Five set light intensities (normal ambient (control), 6.3K lumens, 6.2M lumens, 12.5M lumens and 25M lumens) are introduced individually into a 19-liter container (filled with 5.1 liters of water) containing a single Mozambique tilapia. The tilapia#s movement is videotaped for 15 minutes (calculating the amount of movement in 1-minute intervals from directly above). Recorded fish movement is based upon the entry of the tilapia#s head and torso across a grid matrix ((16) 6.35 x 6.35 cm sectors) displayed across the bottom of the 19-liter container. <b>Results</b> Of the variables tested, tilapia under normal ambient light exhibited a greater amount of movement (average of 11 sector movements/minute). Tilapia exposed to the four higher light intensities exhibited a smaller average of sector movements (4 sector movements/minute under 25M lumens) amongst the tilapia subjects. <b>Conclusions/Discussion</b> Mozambique tilapia, under additional high intensity light, exhibit less movement. Less movement conserves energy and preserves body mass whereas tilapia under normal ambient light show increased activity/movement. The capability of applying intense light could not only take advantage of reflective solar energy, but also may save money in feed costs.	
<b>Summary Statement</b> Determine if a higher light intensity causes a corresponding increase in Mozambique tilapia's movement/activity.	
<b>Help Received</b> Father helped with reviewing video tape and documentation	