Abstract—With increasing population, the need for large scale fishing has increased exponentially. This has produced fish in numbers magnitudes larger than previously seen. However, this also brings new challenges. One of the biggest problems with large scale fishing operations is the bycatch of megafauna. One animal that has a significantly high bycatch rate is sea turtles. Three out of five species of sea turtles that live in the Pacific Ocean are threatened with the other two being endangered. In Baha, Mexico, some fishermen are catching up to 48 turtles per day. Research has shown that one way to minimize these turtle casualties is through the use of specific wavelengths of light. By emitting these specific wavelengths of light, fishermen have been able to deter sea turtle bycatch by up to 50%. However, current methods involve using either disposable lights or disposable batteries. Both of these options are far too expensive and create far too many environmental pollutants to be implemented long term. With this in mind, we plan to design and build rechargeable buoys that emit specific wavelengths of LED light in order to deter sea turtles and other large megafauna.

I. INTRODUCTION

Determining a good form factor is important in creating a successful design. The most important design characteristic is being able to withstand up to 6 atmospheres of pressure. Many different form factors have been theorized to allow for this. A spherical shape works the best at equally distributing the pressure, however, there are other criteria being taken into account. A successful design will also allow for a strong connection to the net while avoiding tangling within the net. There are two options for the buoys connection to the net. The first is to add a clip to the buoy that allows easy attachment and detachment of the buoy from the net. This option offers convenience however lacks in durability. A clip would need to be excessively bulky in order to provide adequate resistance to the various forces acting on it within the ocean. The second option is to create a cavity within the buoy for the rope to be threaded through. This option offers less convenience in removing the buoy however takes advantage of the buoys structural integrity. By integrating the attachment of the rope with the center of the buoy, nothing short of destroying the entire buoy will be able to remove it from the rope.

REFERENCES
