Title – Movement patterns of the Appalachian brook crayfish (Cambarus bartonii) in relation to Branchiobdellidan abundance
Program of Study – Bachelors of Science in Biology w/ a concentration in Environmental Science
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Category – Experimental (Basic)
Abstract:
Crayfish are a keystone species in local aquatic ecosystems. A local species of crayfish, the Appalachian Brook Crayfish (*Cambarus bartonii*) is a first to third order stream crayfish that shares a ectosymbiotic relationship with branchiobdellidans (e.g. *Cambarincola ingens*). Branchiobdellidans are thought to be exclusive to crayfish, but is is relatively unclear as to what mechanism(s) drive this relationship. These ectosymbiotes are known to travel between crayfish through direct contact, but not much is known about this transfer and the movements of the crayfish in their natural environments. An effective way to monitor the movement of *C. bartonii* and branchiobdellidan abundance is with the use of PIT tags. PIT tags provide each marked crayfish with a unique identification. Marked crayfish are able to move unhindered in their natural environment, allowing both movement and the ectosymbiotic relationship to be monitored in a way that would be challenging to reproduce in a laboratory setting. Recapture events of the tagged crayfish can be used to do external counts of branchiobdellidan abundance and location on the *C. bartonii.* This study seeks to discover habitat preferences and movement patterns of *C.* bartonii as well as investigate branchiobdellidan abundance on *C. bartonii.*

Christian Worldview Statement:
My Christian Worldview inspires me to take part in this project because I believe all of God's creation is important. Even those that are generally considered to be negative usually have some sort of benefit. What is considered a small part of the stream, the crayfish, can have large implications on stream health. To know where they live and how they interact with other crayfish in the stream can be used to better understand the benefit these crayfish have been ordained by God to do. There has been an intricate web set in place by our Creator, one that means that every animal has an important job to do. If even one animal's population is upset then the rest of the web is affected. Knowing how many crayfish are in a certain area of a body of water can help show just how many are needed in this web for an area. Crayfish can be difficult to track due to their size and reclusive nature, so this study can better estimate the number of crayfish in a stream. Even though they can be territorial, crayfish still have to interact with each other. Counting the worm population is an easy way to determine this. These worms relate back to the web, as they have a benefit to the crayfish. All of God's creatures are important, and their interaction with each other is the groundwork for an area of nature's health. God set this intricate web in place, and we should learn as much about it as possible, and through that see His glory and power.