The process of divergence is a pillar to the field of evolutionary biologists. However, the act of diverging is not always a defined event with easily recognizable stages. It is instead a dynamic spectrum, with each step melting into the adjacent steps. This can prove troublesome in the evaluation of an organism's taxonomic classification. This problem is expressed clearly in the North American fire ants (genus *Solenopsis*). The *Solenopsis xyloni* species complex, composed of *S. xyloni*, *S. aurea*, *S. amblychila*, and *S. geminata*, has been difficult to resolve phylogenetically due to difficulties in morphological identification, i.e large amounts of variation in size and color, and substantial geographic range overlap. The goal of our study is to more accurately identify where *S. xyloni, S. amblychila,* and *S. aurea* lie in the process of divergence. Another goal is to examine a behavior displayed between *S. xyloni* and *S. geminata* in Texas and Mexico. These two species form an unusual hybrid zone where the only viable colonies are those composed of pure *S. geminata* or those composed of *S. xyloni* queens and hybrid *S.* xyloni/*S. geminata* workers. We hope to be able to tell how different the hybrid organisms are genetically from their hybrid parent species. To complete both of these objectives, we will be comparing mitochondrial genes (cytochrome oxidase 1 and cytochrome b) between each species. The specimens were collected from multiple different colonies from southern California to eastern Texas and Mexico. Phylogenetic reconstructions, based on the mitochondrial DNA, will create evolutionary trees based on Bayesian criteria and parsimony. Using the results of these analyses, it should add to our knowledge as to whether or not *S. xyloni*, *S. aurea*, and *S. amblychila* are all one polymorphic species or are a complex of multiple species.