Independent Project Draft Script [redacted]
BIO 295 *March 7, 2014*

The Wolfpack of Isle Royale

Marris E. 2014. Iconic island study on its last legs. Nature [Internet]. [2014 Feb 12, cited 2014 March 1] 506(7487):140-141. Available from: http://www.nature.com/news/iconic-island-study-on-its-last-legs-1.14697.

Introduction

For almost 60 years, populations of wolves and moose have been monitored on the island of Isle Royale, which is found near the edge of Lake Superior, close to the US-Canada border. The two species have provided excellent insight into predator-prey interactions and carrying capacity of each individual population in an island ecosystem. As the years have passed, however, researchers are beginning to look at how an abundance of natural factors is having a negative effect on the wolf population in particular. These factors include the lack of selection and migration prevention due to climate change. Both of these factors are contributing to the abundance of inbreeding in the population of wolves on the island, which as a result has had many negative consequences.

Researchers continue to evaluate numbers of wolves to determine whether this event is just part of the ebb and flow of the moose and wolves interactions, or if the environment is working against the wolves. If the latter is taking place, without human intervention through introduction of new alleles into the population, the wolf population on Isle Royale could be lost forever. Countless organizations and experts are in the process of evaluating all options to see what can and should be done for the wolves of Isle Royale.

Concepts

1. Founder effect and limits on gene flow/migration
    a. Ecological Isolation, in particular habitat isolation, can prevent genes from flowing between populations. Founder effect, the movement of a subset of a population into a new physical location, can cause loss of genetic diversity.
    b. The founder effect can be seen for both the moose and wolf populations, but the effect has been more drastic for wolves due to their smaller population that migrated from the mainland. Gene flow and migration are limited to times when the ice bridge freezes over, and even then there is a possibility that the wolves from the mainland will not migrate onto Isle Royale.

2. Inbreeding

a. Mating between individuals that are more closely related to each other than would naturally occur due to chance can cause genetic problems within the population.
b. The lack of genetic diversity in the population has lead to morphological deformities in the wolves. These deformities could possibly be affecting attacking efficiency. If inbreeding is occurring, some form of selection and mutation must be present to assure that the population's gene pool is changing. We see this selection with the finches of the Galapagos islands, but with no strong selection occurring for this small population of wolves on Isle Royale, the inbreeding is proving to be detrimental.

3. Island Specifics
    a. There is a set of attributes that allow most islands to be excellent study systems.
    b. Isle Royale has a couple of these required attributes and therefore exemplifies what makes it such an excellent study system.
        i. Small with distinct boundaries
            1. Isle Royale is approximately 210 square miles, most equivalent to the island of Santiago in the Galapagos. The last time there was a land bridge from Isle Royale to was in 2008 and before that it was in 1997. Therefore, the populations present have lived relatively undisturbed for seventeen years.
        ii. Simplified Biotas
            1. The three main interacting species of the island are the wolves, the moose, and the fir trees that the moose feed on.
        iii. Age
            1. The populations on Isle Royale are relatively young. The original population of moose came across the land bridge from Canada in 1910, and the wolves came across thirty years later in 1940.

Movie

For our project we will set up a news show/NPR radio show spoof, based roughly on work seen on SNL or Stephen Colbert. This form of video will allow us to inform the audience on what is going on with the Isle Royale situation, including the basic terminology and concepts, while also entertaining them through clever comedy. We first will explain how this island study system and others work. Then we will explain the past work that has been done with the wolves and moose and how this has impacted our views of ecology. When will then look at the current dilemma facing the wolves and how this affects their populations. In addition we can show how the changes in the wolf population are affecting the other populations (moose & fir) on the island. Lastly, we will bring up the possibilities of how this situation can be handled.

COMMENTS:

Hi [redacted] & [redacted],

Overall, you did a very good job on the draft script. You submitted the assignment on time and included all the elements I asked for. You received full credit for this assignment.

As we already discussed in class, your article, although very interesting, is not an original research paper, the author is a popular science writer (http://emmamarris.com/) which is why you found this in the News in Focus section of Nature. The lack of "literature cited" at the end and no detailed methods/results described could have tipped you off but I can see how this can be confusing sometimes.

I do agree that the study system lends itself nicely to this project and the general theme of the class and I like your ideas for implementation. You can stick with the article but I will ask you to find **1-2 original research papers** that have generated these data (I saw one citation in the article but I wonder if papers by John Vucetich and Rolf Peterson might also be helpful).

Think about this movie as telling a story. You are telling the story of the paper you chose.
Treat this movie as if you will show it to your grandmother and she needs to understand what has been done in the study you chose and why it matters!

Next week I will provide a sign-up sheet so everyone can meet with me to discuss their project.

Best,
D. Magdalena Sorger