CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)

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Project Number

34183

Project Title

Sustainable Future for Endangered Species? Predicting the Impacts of the Wilmar Policy on Bornean Orangutan Populations

Abstract

Objectives/Goals

The Bornean orangutan has been classified as endangered since 1986. They are threatened by illegal poaching and habitat loss, largely caused by land conversion to palm oil plantations. In December 2013, the world's largest palm oil trader, published a "No Deforestation, No Peat, No Exploitation Policy." The objective of this study is to predict the effects of the policy on the sustainability of orangutan populations.

Methods/Materials

Using object-oriented Python, 36 orangutan habitats and their populations were mathematically modeled in 11 different scenarios with varying levels of logging, reforestation, and poaching as well as stochastic insertions of catastrophes and bonanzas and were used to produce 396 models with 100 replicates each. The sustainability of each scenario was analyzed.

Results

Without any intervention the Bornean orangutan populations could be extinct within 100 years. The only scenarios with sustainable populations are those with poaching is reduced from the current 4-12% annual rate. Sustainability doubles when poaching is reduced from 1% to 0.5%. There is an almost 10% increase in sustainability when additional protection of lowland mosaic is implemented.

Conclusions/Discussion

The Wilmar plan is necessary for orangutan survival when coupled with poaching management.

- Unsustainable populations should be connected to other sustainable areas, or exchanged to industry for the protection of lowland mosaic.
- The plan should be enhanced to include conservation of lowland mosaic, to provide a 10% increase in population sustainability.
- A focused effort to reduce poaching to 0.5% must be initiated as soon as possible.

Without intervention the orangutans may be extinct within 100 years. The urgency of this situation must be made clear so the species can be protected from extinction.

Summary Statement

This study predicts the effects of the top palm oil trader's "No Deforestation, No Peat, No Exploitation Policy" on the sustainability of the endangered Bornean orangutan populations.

Help Received

Dr. David Bernick was my mentor; Lauren Lui and Jacob Schreiber, UCSC graduate students, tutored me in Python; Patty Freedman assisted background research and land cover pixel counting; Miriam Swaffer, UCS, introduced me to Dr. Erik Meijaard Dr. Serge Wich; Dr. Erik Meijaard and Dr. Serge Wich