# Research paper on conservation genetics

Science, Genetics

\n[toc title="Table of Contents"]\n

\n \t



\n[/toc]\n \n

## Introduction

According to Frankham, Ballou and Briscoe (2009), conservation genetics is a basic and applied science that deals with molecular biology, ecology, mathematical modeling and construction of family relationships. For scientists to apply management techniques, they must understand the genetic relationships that exist between the different organisms under study. In addition, the organisms being studied are usually endangered species. Endangered species are those species that are at a high danger of instant extinction (Frankham, Ballou &Briscoe, 2009).

## Causes of Extinction

Most extinction results from human factors (Frankham, Ballou &Briscoe, 2009). Over the previous century, the human population has grown exponentially. This has resulted to adverse impacts on the animal and plant community. Genetic factors have a significant impact on the inbreeding of species, harmful mutations and loss of genetic diversity (Frankham, Ballou

&Briscoe, 2009). Furthermore, loss of genetic diversity reduces the capability of species to endure with changes in the environmental condition, which results to their extinction.

## Use of Genetics in Conservation

Genetics play a pivotal role in conservation of species (Fox, 2008). For instance, the Florida panther that was at a risk of extinction due to inbreeding defects and low genetic diversity was saved through breeding with panthers from closely related sub-species from Texas. Through detection of low genetic diversity among certain species such as the Asiatic lions, species at risk can be identified. Furthermore, through genetics hybridization of species to existence can be minimized.

## Importance of Genetic diversity

A species is made vulnerable to extinction because of a decline in the genetic diversity of the genes of a species (Fox, 2008). A species with a low genetic diversity may lack necessary characteristics for them to survive the changing environmental conditions, whereas species with high genetic diversity may have genes that may allow them to survive to new external conditions. The genes present in the current population have a risk of disappearing with no chance of being recovered because of the high variability of genetic diversity.

Molecular ecology is one of the venues through which genetic conservation is achieved. Furthermore, molecular genetics combines various tools from population genetics to make inferences about populations. Through molecular ecology, identification of species that are difficult to capture can

be slightly identified. In addition, molecular ecology allows analysis of parentage among populations and estimation of population size as a gauge of genetic processes. Furthermore, reproduction in discrete populations, estimation of gene flow, and detection of hybridization is also determined. Some of the methodologies that are employed in animal conservation genetics include use of amplified fragment length polymorphisms (AFLPS), DNA sequencing, SNP analysis and use of microsatellites. Techniques used in plant genetic conservation include the randomly amplified polymorphic DNA and inter-simple sequence repeats (ISSRS).

Most of genetic variations occur because of mutations, which are both neutral and rare. Gradual increases in deleterious mutations result in reduction of viability and decrease in population. In addition, another cause of genetic variation may occur because of genetic drift. This refers to the indiscriminate fluctuation of gene frequencies that occur unexpectedly over time. Furthermore, gene flow poses a problem in that not all species breed thus measuring of the gene flow could be problematic.

## Conclusion

As the world’s human population continues to grow, more knowledge on the field of conservation genetics will be required in order to deal with the pressures on the different biota. In addition, the study of conservation genetics is going to be expanded to reach more species in different ecological settings (Fox, 2008). Areas where different opportunities will arise using the newly emerging molecular genetics technologies include local kinship, conspecific populations, supraspecific issues, and forensic applications.

# References

Fox, C. (2008). Conservation Biology: Evolution in Action. New York: USA.

Oxford University

Press.

Frankham, R., Ballou, D. & Briscoe, D. (2009). Introduction to Conservation

Genetics (Second

Edition). Cambridge University Press.