PARROT CONSERVATION

Research Area: Conservation Genetics

Background: The St. Vincent Amazon Parrot (*Amazona guildingii*) is a species endemic to the Caribbean island of St. Vincent. As with many island species, habitat destruction and the pet trade have significantly reduced the number of these birds remaining in the wild. In a unique effort to preserve this species, conservation officials on St. Vincent led the organization of the St. Vincent Parrot Consortium. This Consortium is dedicated to preservation of St. Vincent parrots in the wild and captive breeding of parrots for return to the wild. Realizing that many parrots were being illegally held in captivity, conservationists decided to try an unusual tactic. Instead of prosecuting offenders, which rarely yielded significant results, bird owners were encouraged to openly participate in the Consortium. In return, the birds were provided with free veterinary care and the owners were trained how to collect behavioral data. Along with this effort, the Consortium has worked to identify habitat on the island that can be returned to a condition that will support the parrots. Recently, biologists have concluded that the vegetation at one protected site is now old enough for parrots to be re-established. Habitat survey work and predator control (domestic cats and introduced mongooses) is underway at the site. The biologists would like to release at least two pairs of parrots onto the site. These parrots are to come from owners who have agreed to exchange their healthy birds for injured or aged parrots that are not candidates for release. Eight parrots (4 males and 4 females) have been identified for potential release. The histories of the birds are unclear as some of the owners have told different stories at different times. Given then way that parrots were obtained, some of the birds may have had the same parents or they may have come from the same family group. A big concern for the biologists is that inbreeding is a problem for this species. They would like to be sure that the two pairs released are as unrelated as possible. A geneticist, visiting the island on a sailing holiday, has suggested that the birds be genotyped and the pairs selected based on which combinations are the least related. The biologists have decided to try to obtain and use this information for designing their re-establishment plan.

Information and Data:

You have been contacted by the Parrot Consortium to help determine which combination of the available birds would be the most appropriate to release. You are being asked to use DNA genotypes as markers to help distinguish among individual birds and to help you decide if individuals might be related. In this type of genotype analysis, you will have to rely on basic Mendelian principles but remember that

markers that can exclude an individual are more powerful than markers that are shared.

- You are provided with 1 DNA sample from each of the eight parrots.
- Your laboratory has the capability to determine genotypes at six microsatellite loci. All the loci exhibit co-dominant modes of inheritance. Some of the locus will be informative, some may not. You may use as many or as few loci as you feel are necessary.

Assigment:

1. Use the *ELS* program to collect genotype data from each of the 8 samples. Be sure to carefully record the sample identification information on the **Electrophoresis Loading Sheets** and the genotypes on the **Genotyping Data Sheet.** Your data set is called *Parrot Data.*
2. Before examining the data, propose a hypothesis for one possible outcome of your investigation. Based on this hypothesis, state a prediction and an alternative that will allow you to answer the investigator's question.

Hypothesis:

Prediction 1:

Alternative:

4. Examine the data set. Are any birds clearly unrelated to the others? Do any of the birds appear to be sibs? Can you refute either your prediction or the alternative? Carefully consider the logic that you use.

5. What the biologists really want to know is, of the 8 available birds, what is the best combination of male and females to pair together, given the objective of pairing the least related individuals?

6. Using the word processor on your computer, write a report (see Report Format instructions) outlining your investigation, describing the results and providing your conclusions. Be sure to include careful statements about the logic that led you to your decision.

7. Submit your report and your worksheets to your TA.