EEB/ANTH 4329: Primate Ecology and Social Behavior
Lab: Computer Models of Primate Behavior

In this lab we will explore the role of group size and predation rate in survival and reproduction. By combining two levels of group size and two levels of predation rate we will explore how these factors interact to influence survival and reproduction. As before, primates will go about searching for food and mates and males will transfer between groups. In addition to these behaviors, the primates will also interact with predators. When a primate perceives a predator it will strive to avoid it. If it comes into direct contact with the predator it will receive a predation cost (in terms of energy). If this predation cost exceeds the level of energy the primate currently has it will die. The goal of this lab is to have you think about the costs and benefits of living in different types of social groups and how these costs/benefits might vary in different environments.

New Definitions

   Predation rate- the rate at which new predators appear in the environment
   Predation duration- the number of ticks in which a given predator remains in the environment
   Predation cost- the total energy cost of interacting with a predator

Instructions

1. Open the Primate Ecology Lab Model from last week in NetLogo.
2. Set Fixed settings to the values listed below.
3. Set Variable settings to the values associated with each of your four models
4. Run each of the four models twice for 200 ticks each
5. Record your results for each model on your datasheet
6. Share your data with the class and record class averages

Fixed Settings

Patch Settings		Perception range	2
patch abundance	0.5	*Life History*	
patch patchiness	0.5	age-at-maturity	25
Patch growth rate	5.04	life-expectancy	400
Patch-max energy	50	*Dispersal*	
Primate Settings		female-transfer?	Off
Energy Costs & Gains		male-transfer?	On
max-energy	660	*Weighted Strategies*	
birth-cost	240	home-weightedness	4
food-eaten-per-step	32	food-weightedness	5
energy-cost-per-step	6	conspecific-weightedness	6
aggression-cost	18	male-weightedness	6
Evolving Traits		predation-weightedness	7

Name: _____Date_____

avg-fighting-ability	0.5
avg-intragroup-tolerance	0.5
avg-intergroup-tolerance	0.5
female-female-tolerance	0.5
female-male-tolerance	0.5
male-male-tolerance	0.3
male-female-tolerance	0.9
Predator Settings	
Play alarm calls	Off
Predation duration	10
Predation cost	50

Variable Settings

Predator Settings

	Low Rate	High Rate
Predation rate	.25	.75

Group Settings

	Small Group Size	Large Group Size
Initial group count	5	2
Initial number males	10	25
Initial number females	10	25

Results

Rep		Low Rate/ Low Size	Low Rate/ High Size	High Rate/ Low Size	High Rate/ High Size
1	# of Primates				
2	# of Primates				
	Class Average				

Questions

1) Describe two costs and two benefits of large group size in primates

Name: _____ Date_____

2) Graph your expected results for the interaction between group size and predation risk and explain the rationale for your predictions in the space below

3) Graph the actual results for the interaction between group size and predation risk

4) Explain how the results differed from your predictions

5) How might you verify the results of the model with real data?