Name: _____ Date_____

EEB/ANTH 4329: Primate Ecology and Social Behavior
Lab 3: Benefits of Social Life: Protection from Predation

One of the major benefits proposed for group-living in primates is protection from predators. In this lab we test whether a predisposition towards social behavior can provide help primates defend themselves more effectively from predators.

The simulated world is generally similar to the one from last week, except with predators instead of parasites. The main difference between a predator and a parasite is the relative size of the attacker to the victim. Predators are generally similar in size to their victim, and often consume their victim entirely in a single meal, whereas parasites are much smaller than their victim, and eat only a tiny bit of their victim at once.

In this lab, the predators are depicted as Tigers. These Tigers are ambush predators, and can only succeed in hunting Primates when they are hidden from view. Primates may give an alarm call upon seeing a Tiger. Once an alarm call has been given, the Tiger can be seen by any Primate in the area; having lost the element of surprise, the Tiger cannot hunt successfully for some time, until it becomes hidden again. Tigers that hunt successfully stay in the area, whereas those that don't get anything to eat wander off to look for food elsewhere.

Instructions

1. Download the latest NetLogo model from your TA.
2. Set the **Patch** and **Primate Settings** as listed below.
3. Click on **setup** to initiate the model. NetLogo will prompt you to load a text file, which is the primate's digital chromosome. This chromosome determines whether the primate's **predisposition** is either **solitary** or **social**. Once you have loaded the appropriate text file, click on **go** to run the model.
4. You will run a total of four models: ***solitary, alarm calls off; social, alarm calls off; solitary, alarm calls on; and social, alarm calls on.*** Before running any of these models, record your expectations here:

Prediction: In models without alarm calling, will the *solitary* or *social* primates fare better?

_____

Hypothesis: Why do you think that?

_____

Prediction: In the models with alarm calling, will the *solitary* or *social* primates fare better?

_____

Hypothesis: Why do you think that?

_____

_____

5. Let each model run for about 10 minutes, recording the results for each model on your datasheet once the 10 minutes is up. While running your model, take *ad libitum* notes about the behavior and life history patterns of your virtual primates.

initial-number-of-groups	5
Initial-group-size	8
Patch Settings	
patch-count	30
patch-radius	2
patch-growth-rate	5
patch-max-energy	100
Primate Settings	
food-eaten-per-step	30
cost-per-bmr	10
cost-per-unit-step	2
cost-per-growth-unit	15
cost-per-attack	20
Predator Settings	
Predator-size	2
Initial-predator-count	3
Alarm-calls?	ON/OFF*

*Alarm-calls are OFF or ON depending on the model

Results Table:

Trial / Parameter	1	2	3	4
Alarm-calls?	**Off**	**Off**	**On**	**On**
Predisposition	**Solitary**	**Social**	**Solitary**	**Social**
Time (in ticks) at end of simulation				
Average group size				
Average group radius				
Average number of adult females per group				
Average number of adult males per group				
Total number of primates				
# Ticks at which primates became extinct (if they did; otherwise write "NA").				
Total predator population				
# Ticks at which predators became extinct (if they did; otherwise write "NA").				

Lab Report (due before the start of your next section meeting): Write a short (4-5 page) lab report detailing your findings. Lab reports need to be formatted as follows: typed, 12-point font, Times New Roman, double-spaced, 1" margin. Include your name, date, and section number at the top of each page.

This lab report should include the following sections:

Introduction: Briefly stated, what were the goals of your study? What is/are your hypothesis(es)? What is/are your prediction(s)?

Methods: What methods did you use in your study? This section doesn't need to be long, but should concisely describe what you did. A good methods section enables a reader to replicate your study. Make sure to include all relevant information regarding what model you used, what the parameters values were set to, and how the simulations were run.

Results: Summarize your data! What did you find? What patterns of behavior did you see in each model? What differences did you observe in the different models?

Conclusions: This is where you discuss the results of your study, relating your findings to the goals stated in your introduction, and discussing the implications of your findings for broader questions in the field. In this section, you should address the following questions (in addition to any other questions you think are relevant to include):

1. Were these results consistent with your prediction(s)? Why or why not?

2. These models assume that individuals giving alarm calls receive a direct benefit from calling (as the Tiger doesn't attack after it hears an alarm call and knows it has lost the element of surprise). How might the results of the model differ if giving alarm calls was costly to the caller (e.g., if Tigers sometimes attacked callers)?

Works Cited: Please provide the complete bibliographic data for any works cited in the body of the report, using a standard format, such as the following:
Altmann, J. (1974). "Observational study of behavior: Sampling methods." *Behaviour* 49: 227-267). Remember to cite the model!

Appendix: Include a copy of your filled-in results table. Like before, this can be included as a scan, digital photo, or retyped document, for example.