HOMEWORK 3 - SARAH WARD

① 6.1

see WORD DOCUMENT

6.3

Predator-prey

$\oplus \frac{\partial f_1}{\partial N_2}$ $\ominus \frac{\partial f_2}{\partial N_1}$

↑ predator ↑ prey

add more preds; more prey get eaten

Competition

$\ominus \frac{\partial f_1}{\partial N_2}$ $\ominus \frac{\partial f_2}{\partial N_1}$

neither sp. benefits

mutualism

$\oplus \frac{\partial f_1}{\partial N_2}$ $\oplus \frac{\partial f_2}{\partial N_1}$

both sp. benefit from the pop ↑ of the other

② ch 6 $\alpha_{ij} = \frac{\partial F_i}{\partial N_j}$ ← F_i = total growth rates

← N_j = pop. of species j

= rate of change of total growth rates (F_i) with respect to the population of species j (N_j)

ch 7: (α_{ij})

$$\frac{dN_1}{dt} = \frac{r_1 N_1}{K_1}\left(K_1 - N_1 - \alpha_{12} N_2\right)$$

$$\frac{dN_2}{dt} = \frac{r_2 N_2}{K_2}\left(K_2 - N_2 - \alpha_{21} N_1\right)$$

→ α_{ji}

In this case α_{ij} is = to the effect of species j on the population growth rate of species i

Proposal: use α_{ij}. The book actually does this in its first discussion of LOTKA-VOLTERRA