

## Answers to Second Problem Set

1. Note that the best response to B is C, and the best response to C is B. Hence we have a Nash-equilibrium pair. As long as player 1 continues behavior B, player 2 will continue behavior C. As long as player 2 continues behavior C, player 1 will continue behavior B.

Pure A is also a Nash-equilibrium and an ESS: A is the best response to A.

2. Is type 1 more profitable?

$e_1/h_1 > e_2/h_2$  if  $3/1 > 4/2$ . Hence, type 1 is more profitable.

Should type-1 specialization be favored?

$$\frac{\lambda_1 e_1}{1 + \lambda_1 h_1} > e_2/h_2 \quad \text{if} \quad \frac{2(3)}{1 + 2(1)} > 4/2$$

$2 = 2$  implies that specialization on type-1 prey and generalization yield the same expected rate of energy gain.

4. At the IFD, densities in the three patches are, respectively, 20, 40 and 30. Then the resource levels must have the relationship 20:40:30, hence 2:4:3. Given  $k_1 = 12$ , we have  $k_2 = (4/2) 12 = 24$ , and  $k_3 = (3/2) 12 = 18$ . Then the  $k_i$  have the relationship 2:4:3.