

BIO 432 PRACTICE PROBLEMS

A forager searches simultaneously for two prey types; items are encountered sequentially. The net energy values of the two types are equal. The rate of encounter with type 1 (preferred) prey is $\lambda_1 = 2.1$; the handling time of a type 1 item is 7.9 time units. What handling time for a type-2 item yields the same rate of energy gain through generalizing as does specializing on type 1 prey?

A forager searches an environment with two food types and encounters items sequentially. The encounter rate with type 1 items while searching is $\lambda_1 = 1$ item/time. The encounter rate for type 2 items is $\lambda_2 = 4$ items/time. Net energy values for the prey types are $E_1 = 3$, and $E_2 = 4$. Handling times are $h_1 = 1$, and $h_2 = 2$. Which type has greater "profitability?" Should this forager specialize or generalize? If λ_1 is increased to 2, what happens?

Identical players interact as pairs. Each player chooses action A or action B. The payoffs affect each player's fitness according to:

	A	B
A	2	3
B	3	4

Comment on any evolutionarily stable strategies.

Proceed as in the preceding question.

	A	B
A	3	3
B	2	4

Proceed as in the preceding question.

	A	B
A	2	4
B	3	3

Suppose $y = 12x - 3x^2$. Show that $(x = 2)$ maximizes y .