Biology 4605 / 7220 Name Key

Quiz 9b 24 November 2004

1. For the following data situations, state the name of the unit of analysis and whether the response variable is poisson (counts within unit of analysis) or binomial (scoring of each unit as yes/no). [Note: similar to Quiz 9a, but not in same order]

1a. A mark recapture study involving 30 fish released into each of 4 ponds.

1b. A study of the number of lesions on rats exposed to several levels of a pesticide.

1c. A study of survival rates of marked snails infected by parasites, at high and a low temperatures, for young and old snails.

1d. A study of number of species counted on small mangrove islands, at several time intervals after defaunation.

	Name of unit of analysis	Binomial/ Poisson	Symbol	Link	Error Type
1a	Fish	Binomial	Nfish	logit	Binomial
1a	Ponds	Poisson	Nfish	log,identity	Poisson
1b	Rats	Poisson	Nrats	log,identity	Poisson
1c	Snails	Binomial	Nsnail	logit	Binomial
1b	Islands	Poisson	Nrats	log,identity	Poisson

2.

Assign a symbol to each variable in the table above, state the link and error type you would use in a generalized linear model to analyze that response variable.

Identity link $Y = \mu$ Log link $Y = e^{\mu}$ Logit link $\ln(p/(1-p)) = \mu$

Error types: normal, poisson, binomial, gamma, negative binomial

3. For data situation (1d) list an explanatory variable, assign a symbol, and then using the symbol you assigned, write a generalized linear model of the form:

$\mu = \Sigma\beta_i X_i = \beta_o + \beta_i X_i + \beta_i X_i$ ..... *etc*

Explanatory variable _____ Symbol _____(not X)

μ = _____