

Nonlinear models

ADMB and stock assessment

Arni Magnusson
Anders Nielsen

ICES, 21–25 Feb 2011

Outline

1 Growth

2 Recruitment

von Bertalanffy growth

$$\hat{L}_a = L_\infty \left(1 - e^{-K(a-t_0)} \right)$$

Beverton-Holt recruitment

$$(1) \quad \hat{R} = R_{\max} \frac{S}{S + S_{50}}$$

$$(2) \quad \hat{R} = \frac{S}{a + bS}$$

$$(3) \quad \hat{R} = \frac{aS}{1 + bS}$$

$$(4) \quad \hat{R} = \frac{aS}{1 + S/b}$$

Ricker recruitment

$$(1) \quad \hat{R} = R_{\max} \times \frac{S}{S_{\max}} \times \exp \left(1 - \frac{S}{S_{\max}} \right)$$

$$(2) \quad \hat{R} = aSe^{-bS}$$