Priors over parameters:

Priors over the survivors:

For (2014, a), a=1,...,6 and (y, 7), y=1972,..., 2014

$$surv(y,a) \sim LN\left(median = medrec \times e^{-medM - \sum_{age=1}^{a} medFsurv(age)}, cv = cvsurv \right),$$

where medrec=15000

medFsurv(1,...,7)={0.0001, 0.1, 0.5, 0.7, 0.7, 0.7, 0.7}

cvsurv=1

Prior over F for years with no catch-at-age:

For a=1,...,7 and y=2002,...,2005

$$F(y,a) \sim LN\left(median = medF(a),\ cv = cvF\right)$$

where medF=c(0.0001, 0.005, 0.01, 0.01, 0.01, 0.005, 0.005)

cvsurv=0.7

Prior over the total catch in the years with no catch-at-age data:

For y=2002,...,2005

$$CW(y) \sim LN\left(median = CW_{\text{mod}}(y),\ cv = cvCW\right)$$

where CW_{mod} is arised from the Baranov equation

cvCW=0.05

Prior over the survey abundance at age indices:

For a=1,...,8 and y=1978,...,1985 (Canadian survey) and y=1988,...,2014 (EU survey)

$$I(y) \sim LN\left(median = \mu(y,a),\ cv = \sqrt{e^{\frac{1}{\psi(a)}} - 1} \right)$$

$$\mu(y,a) = q(a)\left(N(y,a)\frac{e^{-\alpha Z(y,a)} - e^{-\beta Z(y,a)}}{(\beta - \alpha)Z(y,a)} \right)^{\gamma(a)}$$

$$\gamma(a)\begin{cases} \sim N(\text{mean} = 1, \text{variance} = 0.25),\ if\ a = 1,2 \\ = 1,\ if\ a \geq 3 \end{cases}$$

$$\log(q(a)) \sim N(\text{mean} = 0, \text{variance} = 5)$$

$$\psi(a) \sim gamma(shape = 2, rate = 0.07)$$

where I is the survey abundance index

q is the survey catchability at age

N is the commercial abundance index

α = 0.5, β = 0.58 (survey made in July)

Z is the total mortality

Prior over natural mortality, M:

$$M \sim LN(\text{median} = 0.218, cv = 0.3)$$