ERRATUM AND ADDENDUM

MODELLING CATCH AND EFFORT DATA USING GENERALISED LINEAR MODELS, THE TWEEDIE DISTRIBUTION, RANDOM VESSEL EFFECTS AND RANDOM STRATUM-BY-YEAR EFFECTS
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Erratum

For the GLMM the 'effective degrees of freedom', r, was incorrectly specified as $r = q - \frac{1}{\hat{\sigma}_u^2}\sum_i \hat{u}_i^2$. The correct formula is $r = \frac{1}{\hat{\sigma}_u^2}\sum_i \hat{u}_i^2$ (Schall, 1991). The results in Candy (2004) were not affected by this notational error since the S-plus® (Insightful Company, USA) function 'reglm' (www.statsci. org/s/reglm.html) used to fit the GLMM implements the correct formula for r.

Addendum

The extended quasi-deviance (EQD) described by equations (7) and (9) in Candy (2004) should be replaced by the corresponding versions (7a) and (9a) below. The modifications given below to the original equations (7) and (9) more appropriately deal with zero values of y by only excluding contributions of $\log_e\{V(y_{ij})\}$ to the EQD when $y_{ij} = 0$ rather than excluding the whole second term in each of equations (7) and (9).

Re-definitions of equations (7) and (9) are given respectively by

$$
\begin{aligned}
&D^*\left(\lambda \,\middle|\, y_{ij}, E_{ij}, \hat{\eta}'_{ij}, \theta = \theta_0\right) \\
&= (N-p) + N\log_e\left(2\pi\hat{\phi}\right) \\
&\quad + \sum_{i,j}\log_e\left\{ V\left(y_{ij}\right)I_{ij} + \left(1 - I_{ij}\right)\right\}
\end{aligned}
\tag{7a}
$$

where

$$
\begin{aligned}
I_{ij} &= 1 \ \text{if} \ y_{ij} > 0 \\
I_{ij} &= 0 \ \text{if} \ y_{ij} = 0
\end{aligned}
$$

and

$$
\begin{aligned}
&D_u^*\left(\lambda \,\middle|\, y_{ij}, E_{ij}, \hat{\eta}'_{ij}, \theta = \theta_0\right) \\
&= (N-p) + N\log_e\left(2\pi\hat{\phi}\right) \\
&\quad + \sum_{i,j}\log_e\left\{ V\left(y_{ij}\right)I_{ij} + \left(1 - I_{ij}\right)\right\} \\
&\quad + q\log_e\left(2\pi\hat{\sigma}_u^2\right)
\end{aligned}
\tag{9a}
$$

where

$$
\begin{aligned}
I_{ij} &= 1 \ \text{if} \ y_{ij} > 0 \\
I_{ij} &= 0 \ \text{if} \ y_{ij} = 0.
\end{aligned}
$$

Figure 1 gives the profile EQD for the fitted GLMM (equation 8 of Candy, 2004) using equation (9a) corresponding to Figure 2 in Candy (2004) and suggests the estimate of the variance function power parameter, λ, should be 1.4 rather than the 1.3 value given in Candy (2004). The revised standardised CPUE series based on GLM (equation 2) and GLMM (equation 8) using $\lambda = 1.4$ were very close to those given in Candy (2004) with the revised Figure 8 indistinguishable from that in Candy (2004). From a small simulation study based on GLM (equation 2) using Tweedie distribution errors it was found that the minimum value of the profiled EQD given by equation (7a) more accurately recovered the value of λ used in
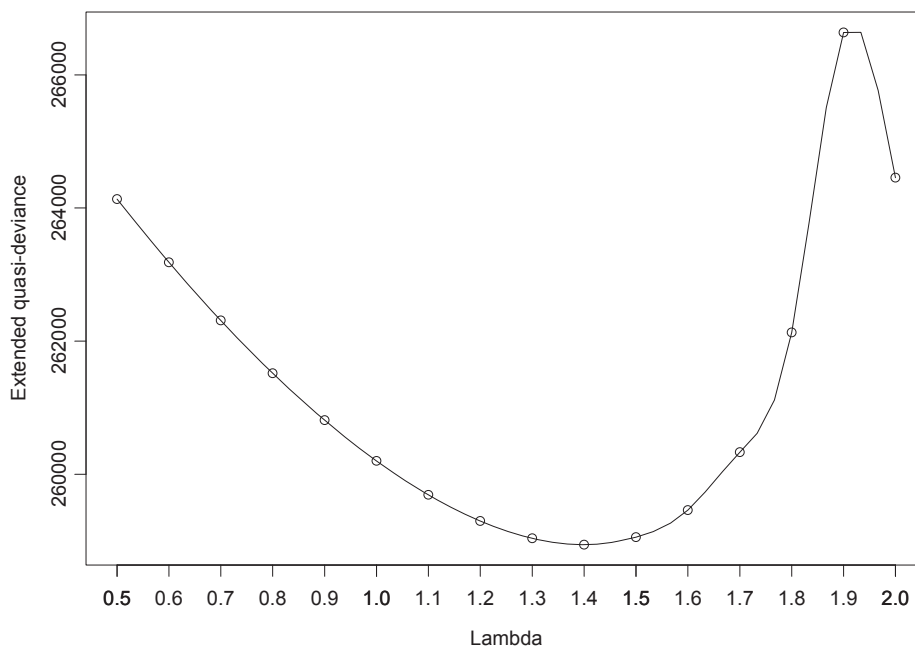
Figure 1:   Profile extended quasi-deviance for lambda parameter in the Tweedie GLMM with log link.

the simulation than equation (7) given in Candy (2004). The S-plus and R (R Development Core Team, 2006) scripts for this simulation are available from the author.

References

Candy, S.G. 2004. Modelling catch and effort data using generalised linear models, the Tweedie distribution, random vessel effects and random stratum-by-year effects. *CCAMLR Science*, 11: 59–80.

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