```
##    df      AIC
## m1 11 116.7996
## m2  7 120.8748
## m3  3 116.3087
```

```
bm = m3
```

The best model is model 3, which includes *light* only.

```
summary(bm)
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## logst(val) ~ light
##
## Parametric coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  -0.2890     0.1555  -1.858    0.069 .
## light         1.1487     0.2014   5.703 6.32e-07 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## R-sq.(adj) =  0.382   Deviance explained = 39.4%
## GCV = 0.52829  Scale est. = 0.50797   n = 52
```

The main effect of *light* is 1.149, which can be back-transformed as $10^{1.149}$ and interpreted as a multiplicative factor. In other words, the model indicates that the maximum standardized peak bird density observed during an illuminated period was $10^{1.149} = 14$ times greater than during dark periods, on average.

Results summarized for the main text:

```
res = summary(bm)$p.table
res = cbind(res,Factor=10^(res[,"Estimate"]))
# Effect of light after exponentiating the coefficient to get multiplicative factor
print.model.summary(res[2,5],res[2,3],res[2,4],units="x",effect.word="factor")
```

```
## [1] "factor = 14x, t = 5.70, P < 0.0001"
```

We now examine two important model diagnostic plots. The first is a standard quantile-quantile (or 'qq') plot, showing the distribution of the residuals compared to the quantiles of a normal distribution. Also plotted are the distributions of 1000 datasets simulated under the model, to show how much variation is expected if all assumptions are fulfilled. In this instance, all points are well within the gray lines; there is no evidence for a deviation from this assumption.

```
qq.gam(bm,rep=1000,pch=1,level=1)
```