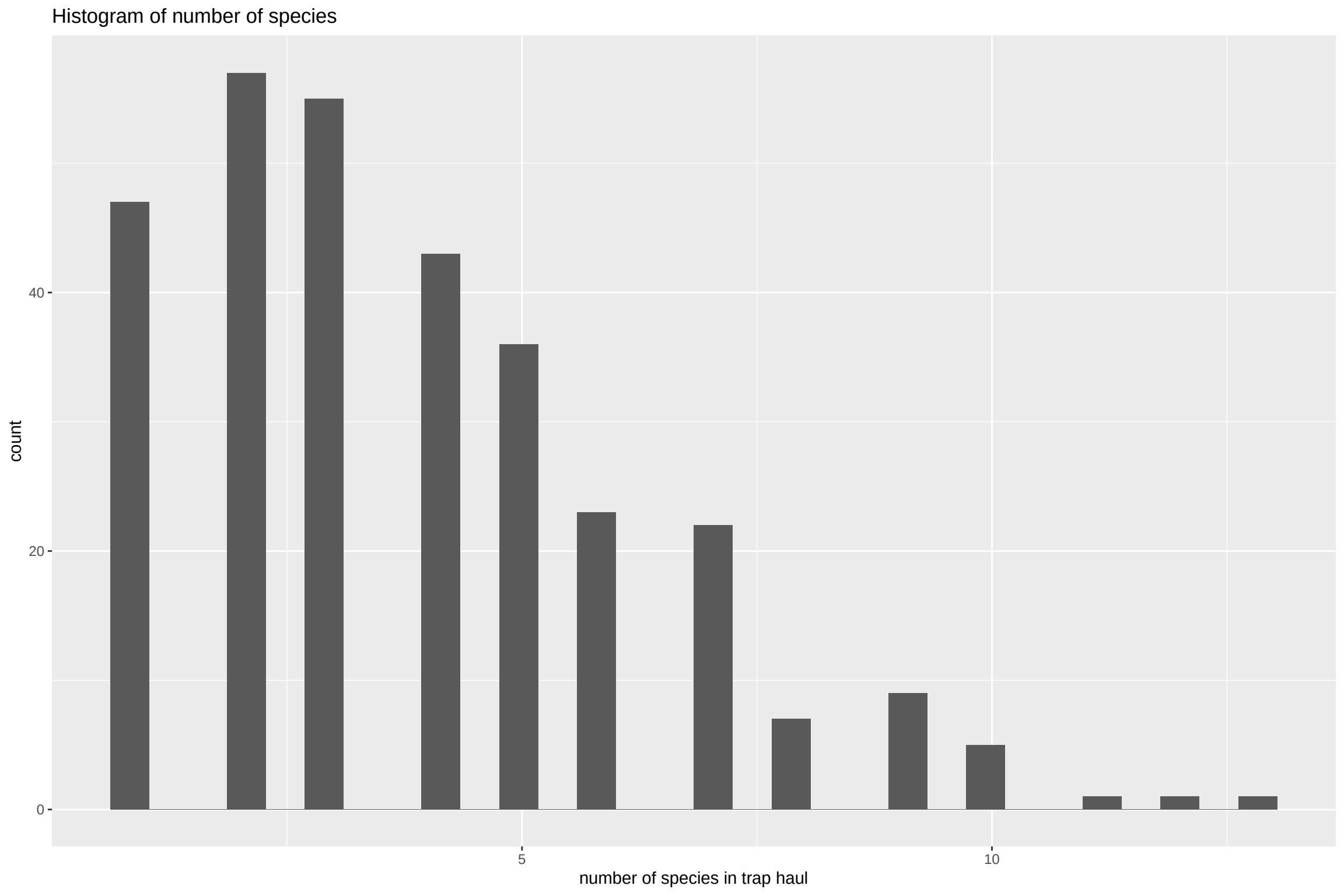
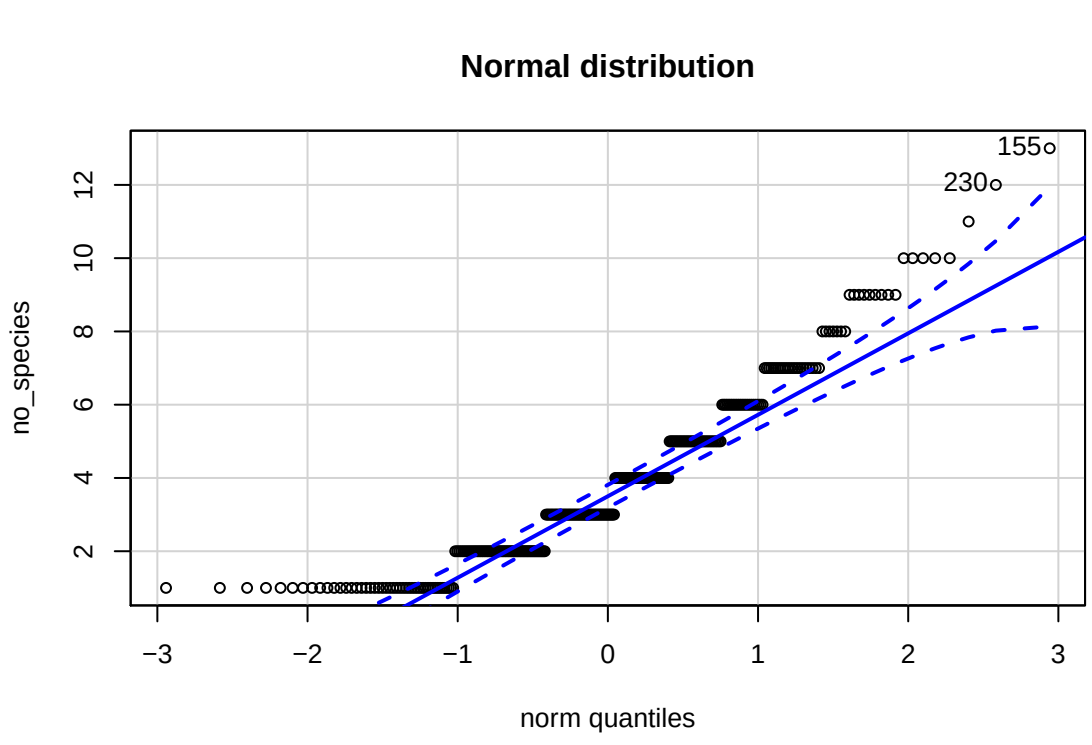
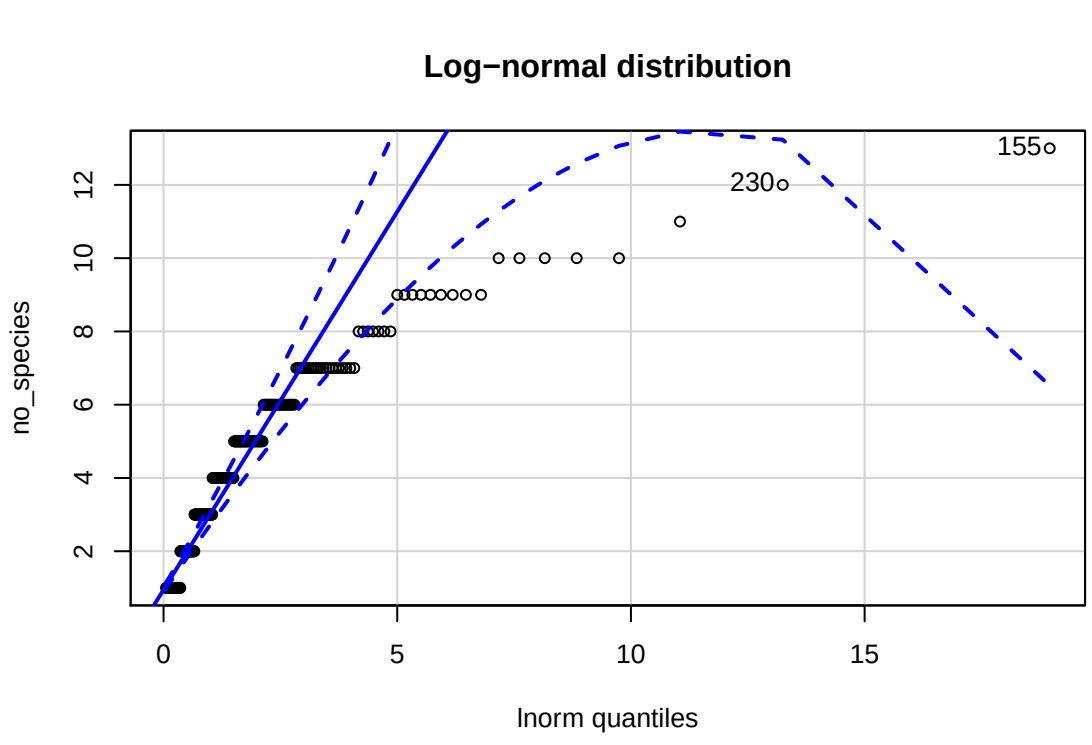
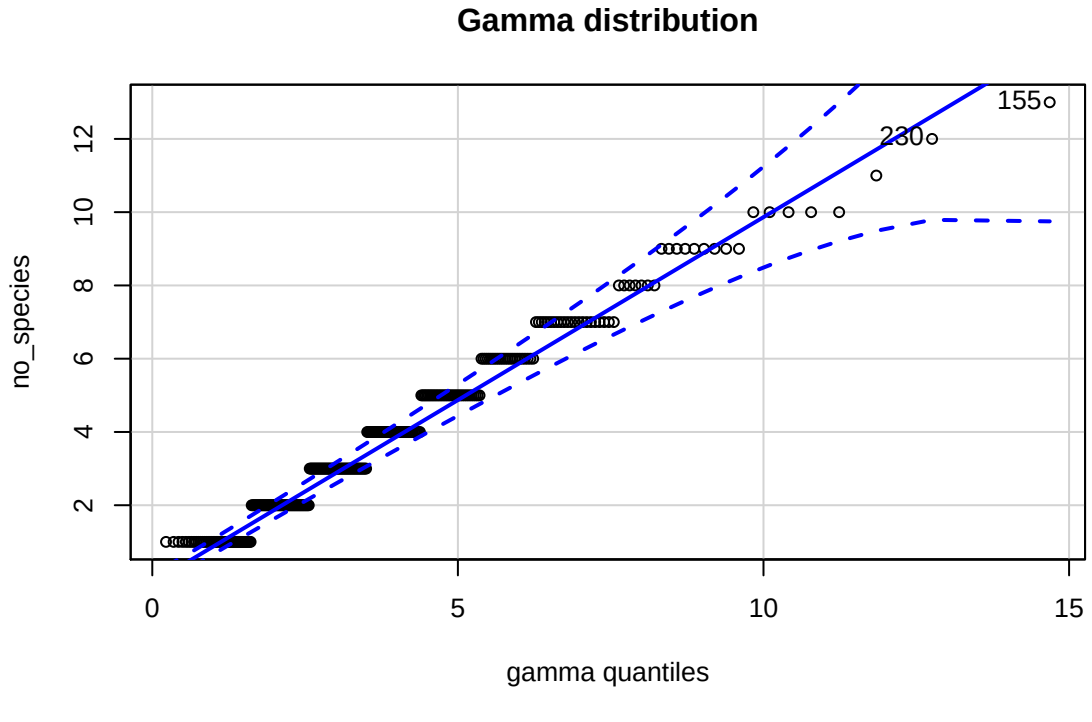
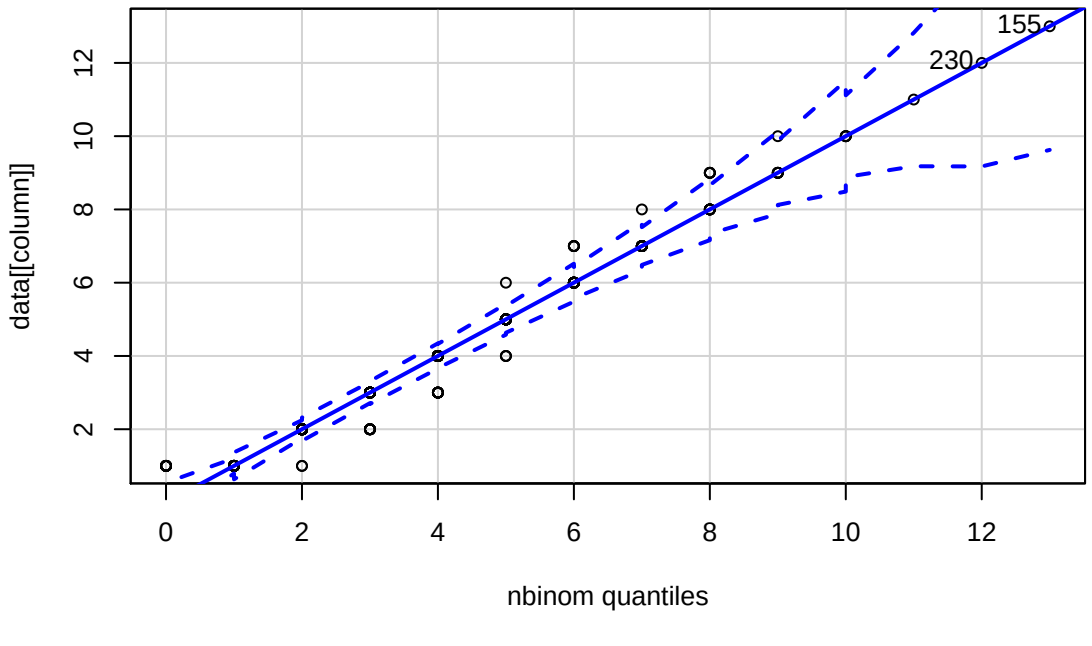
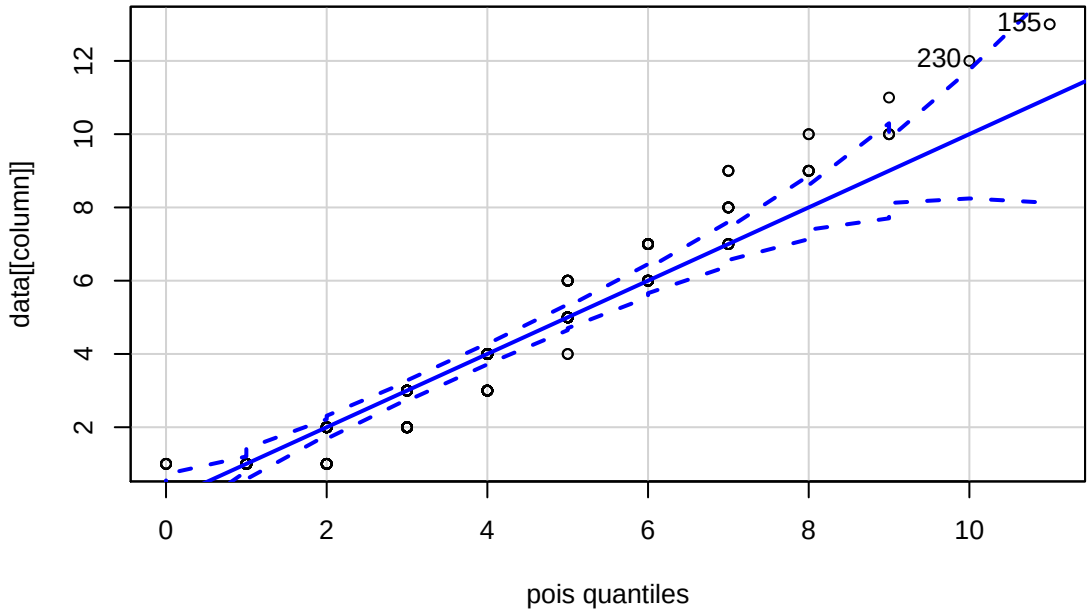

Histogram of number of species
count
0
20
40
5
10
number of species in trap haul


Normal distribution
155
230
no_species
norm quantiles
−3
−2
−1
0
1
2
3
2
4
6
8
10
12


Log−normal distribution
155
230
no_species
lnorm quantiles
0
5
10
15
2
4
6
8
10
12

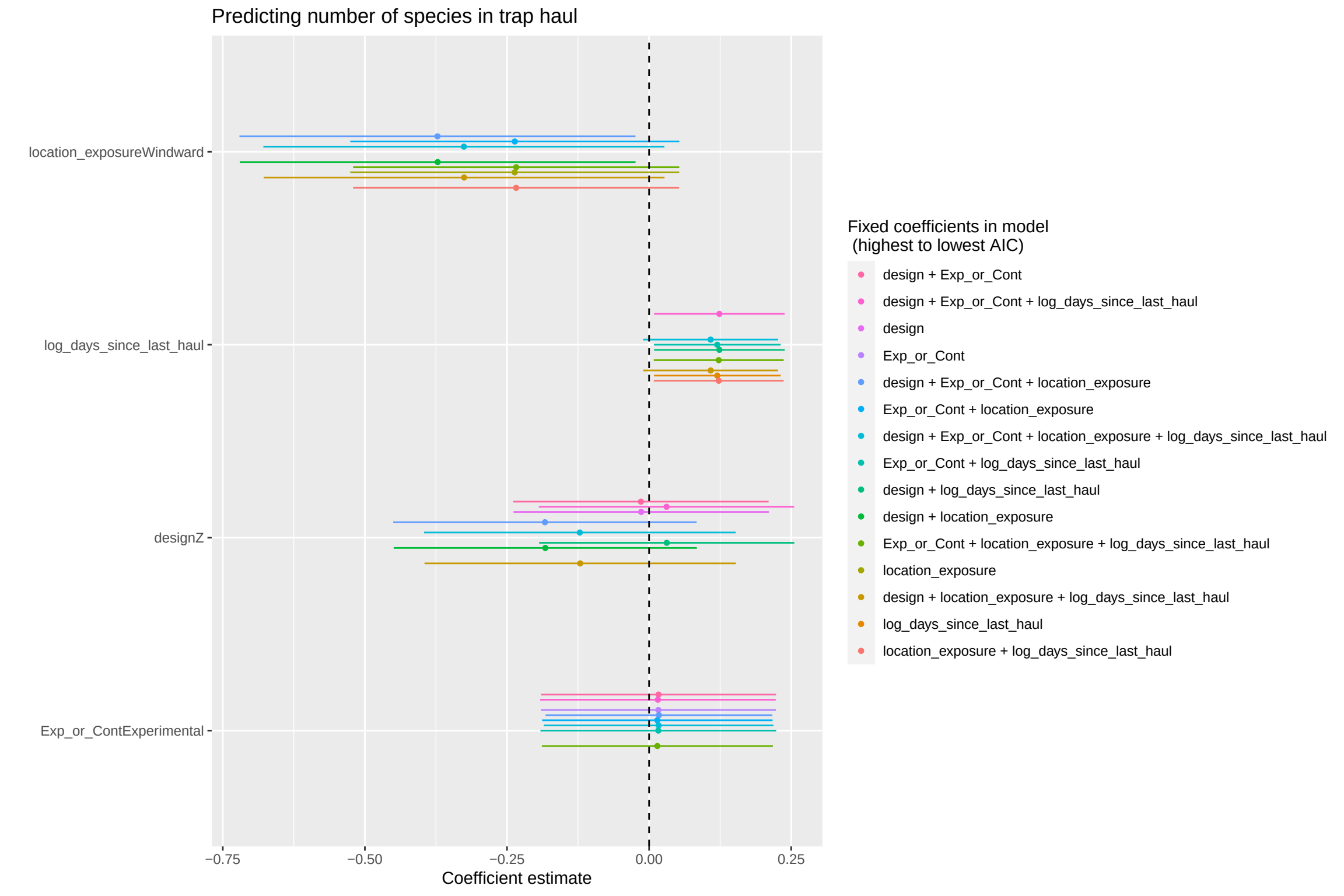

Gamma distribution
155
230
no_species
gamma quantiles
0
5
10
15
2
4
6
8
10
12


155
230
data[[column]]
nbinom quantiles
0
2
4
6
8
10
12
2
4
6
8
10
12


155
230
data[[column]]
pois quantiles
0
2
4
6
8
10
2
4
6
8
10
12

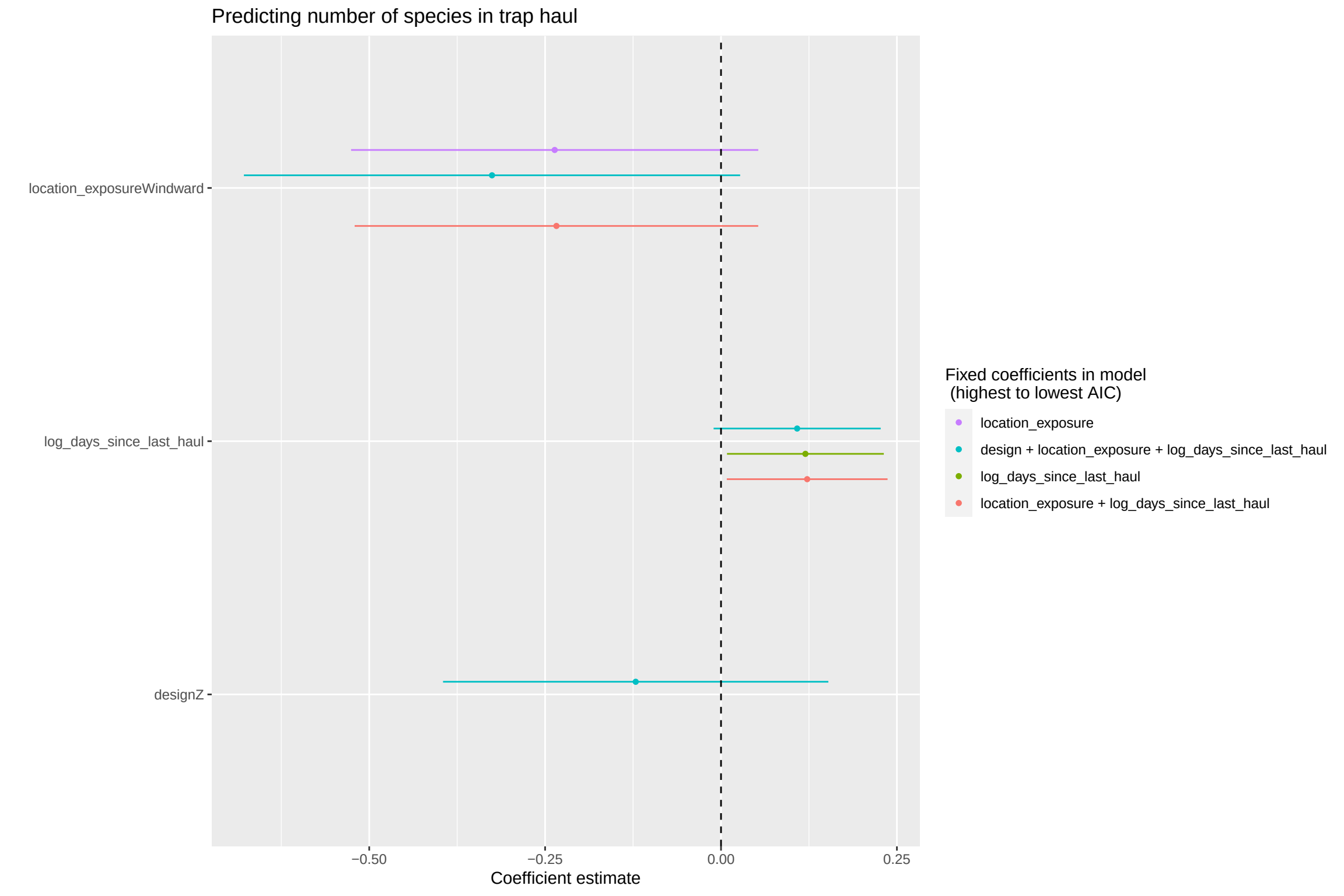
```
Global model call: glmer(formula = no_species ~ design + log_days_since_last_haul +
    location_exposure + Exp_or_Cont + (1 | TrapID) + (1 | Date_YMD),
    data = trap_haul_no_zero, family = MASS::negative.binomial(theta = 16.5443613878562),
    control = glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 10000)),
    na.action = "na.fail")
---
Model selection table
    (Int) dsg Exp_or_Cnt lct_exp log_dys_snc_lst_hal df   logLik   AICc delta
13 1.0570                     +              0.1225  6 −663.208 1338.7  0.00
9  1.0250                                    0.1200  5 −664.501 1339.2  0.51
14 1.1850   +                 +              0.1082  7 −662.834 1340.0  1.35
5  1.3350                     +                      5 −665.164 1340.5  1.83
15 1.0490              +      +              0.1225  7 −663.198 1340.8  2.07
6  1.4810   +                 +                      6 −664.285 1340.8  2.15
1  1.2980                                           4 −666.461 1341.1  2.36
10 0.9964   +                                 0.1237  6 −664.464 1341.2  2.51
11 1.0170              +                     0.1200  6 −664.489 1341.3  2.56
16 1.1760   +          +      +              0.1082  8 −662.821 1342.1  3.43
7  1.3270              +      +                      6 −665.154 1342.6  3.89
8  1.4720   +          +      +                      7 −664.270 1342.9  4.22
3  1.2900              +                             5 −666.449 1343.1  4.40
2  1.3080   +                                        5 −666.453 1343.1  4.41
12 0.9885   +          +                     0.1236  7 −664.454 1343.3  4.59
4  1.2990   +          +                             6 −666.441 1345.2  6.47
   weight
13  0.198
9   0.154
14  0.101
5   0.079
15  0.070
6   0.067
1   0.061
10  0.056
11  0.055
16  0.036
7   0.028
8   0.024
3   0.022
2   0.022
12  0.020
4   0.008
Models ranked by AICc(x)
Random terms (all models):
'1 | TrapID', '1 | Date_YMD'
```

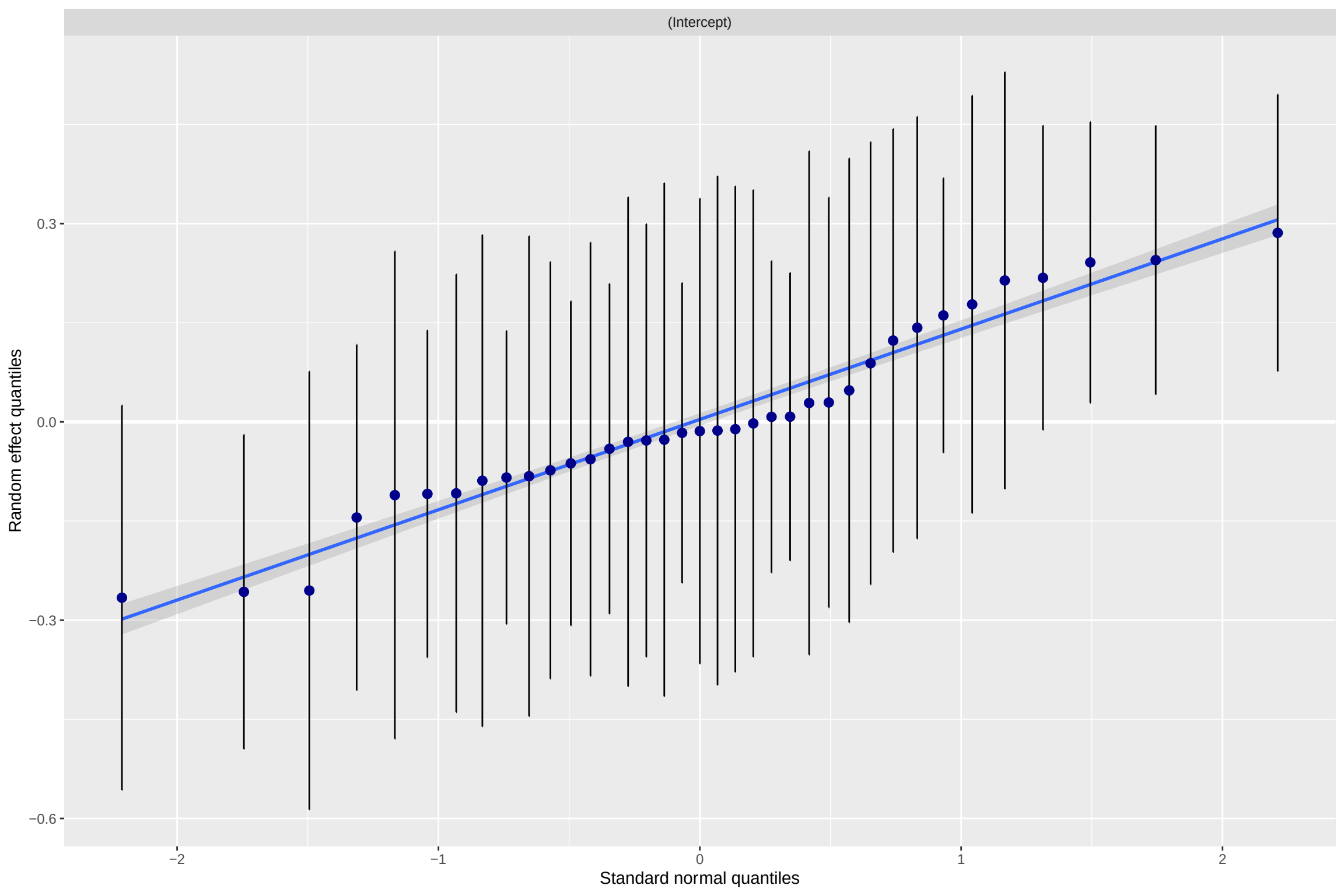
model	sigma	logLik	AIC	BIC	deviance	df.residual
location_exposure + log_days_since_last_haul	1.00	−663.21	1338.42	1360.78	280.12	301.00
log_days_since_last_haul	1.00	−664.50	1339.00	1357.64	282.98	302.00
design + location_exposure + log_days_since_last_haul	1.00	−662.83	1339.67	1365.76	279.99	300.00
location_exposure	1.00	−665.16	1340.33	1358.96	276.08	302.00
Exp_or_Cont + location_exposure + log_days_since_last_haul	1.00	−663.20	1340.40	1366.48	280.06	300.00
design + location_exposure	1.00	−664.28	1340.57	1362.93	277.41	301.00
none	1.00	−666.46	1340.92	1355.83	278.34	303.00
design + log_days_since_last_haul	1.00	−664.46	1340.93	1363.29	282.76	301.00
Exp_or_Cont + log_days_since_last_haul	1.00	−664.49	1340.98	1363.34	282.92	301.00
design + Exp_or_Cont + location_exposure + log_days_since_last_haul	1.00	−662.82	1341.64	1371.46	279.91	299.00
Exp_or_Cont + location_exposure	1.00	−665.15	1342.31	1364.67	276.02	301.00
design + Exp_or_Cont + location_exposure	1.00	−664.27	1342.54	1368.63	277.33	300.00
Exp_or_Cont	1.00	−666.45	1342.90	1361.53	278.28	302.00
design	1.00	−666.45	1342.91	1361.54	278.53	302.00
design + Exp_or_Cont + log_days_since_last_haul	1.00	−664.45	1342.91	1369.00	282.70	300.00
design + Exp_or_Cont	1.00	−666.44	1344.88	1367.24	278.48	301.00

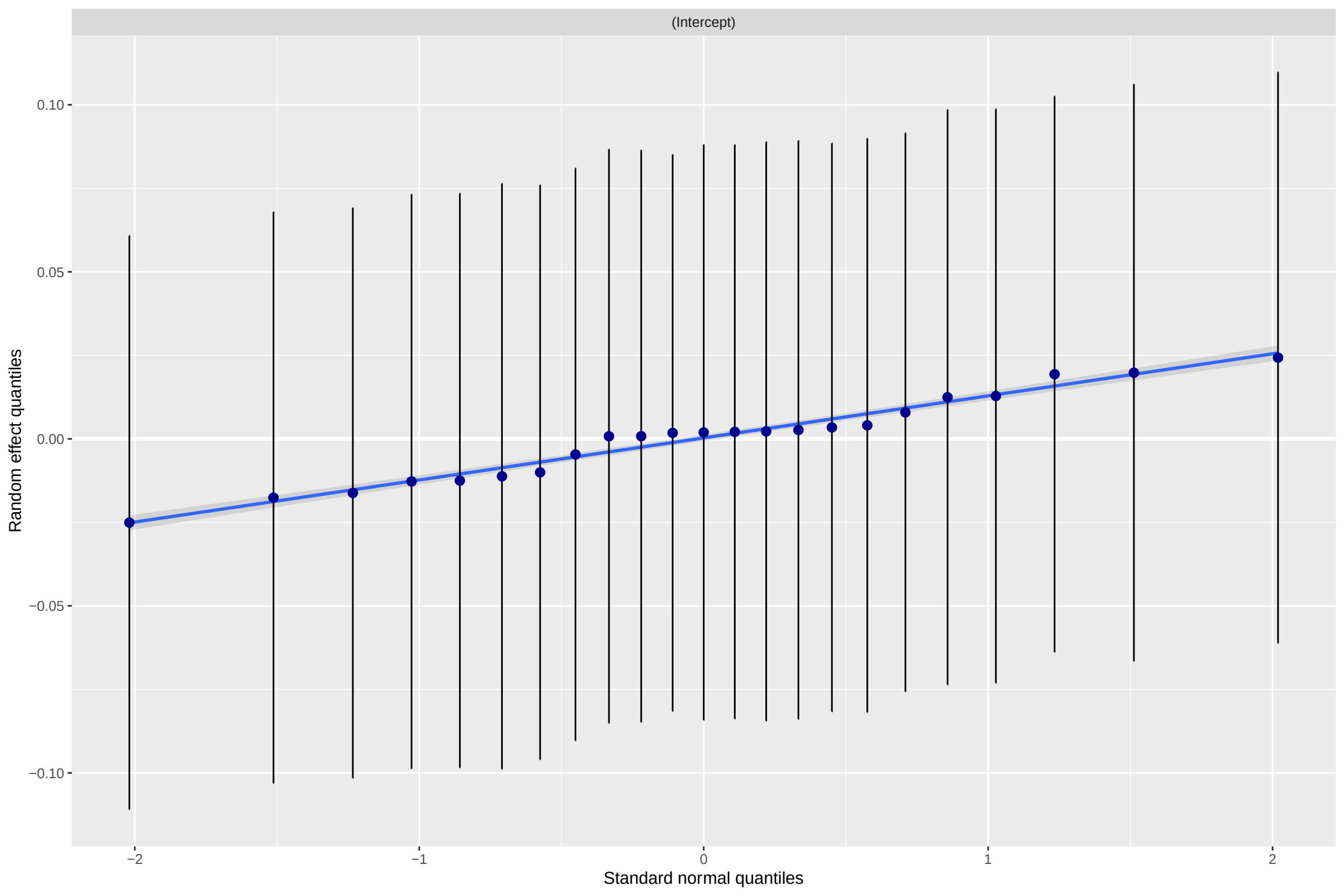

Predicting number of species in trap haul
location_exposureWindward
log_days_since_last_haul
designZ
Exp_or_ContExperimental
−0.75
−0.50
−0.25
0.00
0.25
Coefficient estimate
Fixed coefficients in model
(highest to lowest AIC)
design + Exp_or_Cont
design + Exp_or_Cont + log_days_since_last_haul
design
Exp_or_Cont
design + Exp_or_Cont + location_exposure
Exp_or_Cont + location_exposure
design + Exp_or_Cont + location_exposure + log_days_since_last_haul
Exp_or_Cont + log_days_since_last_haul
design + log_days_since_last_haul
design + location_exposure
Exp_or_Cont + location_exposure + log_days_since_last_haul
location_exposure
design + location_exposure + log_days_since_last_haul
log_days_since_last_haul
location_exposure + log_days_since_last_haul

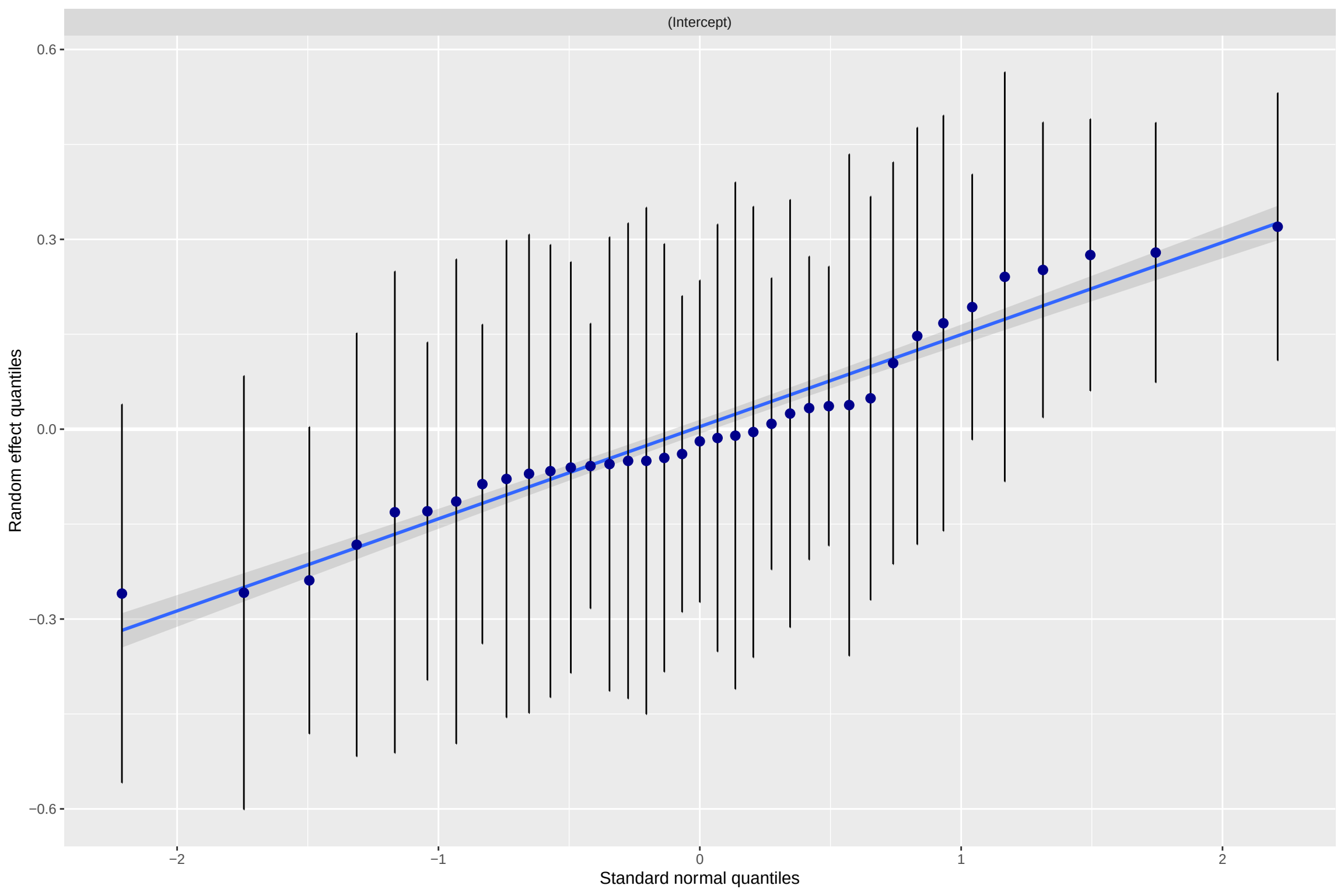
Models with delta AIC <2

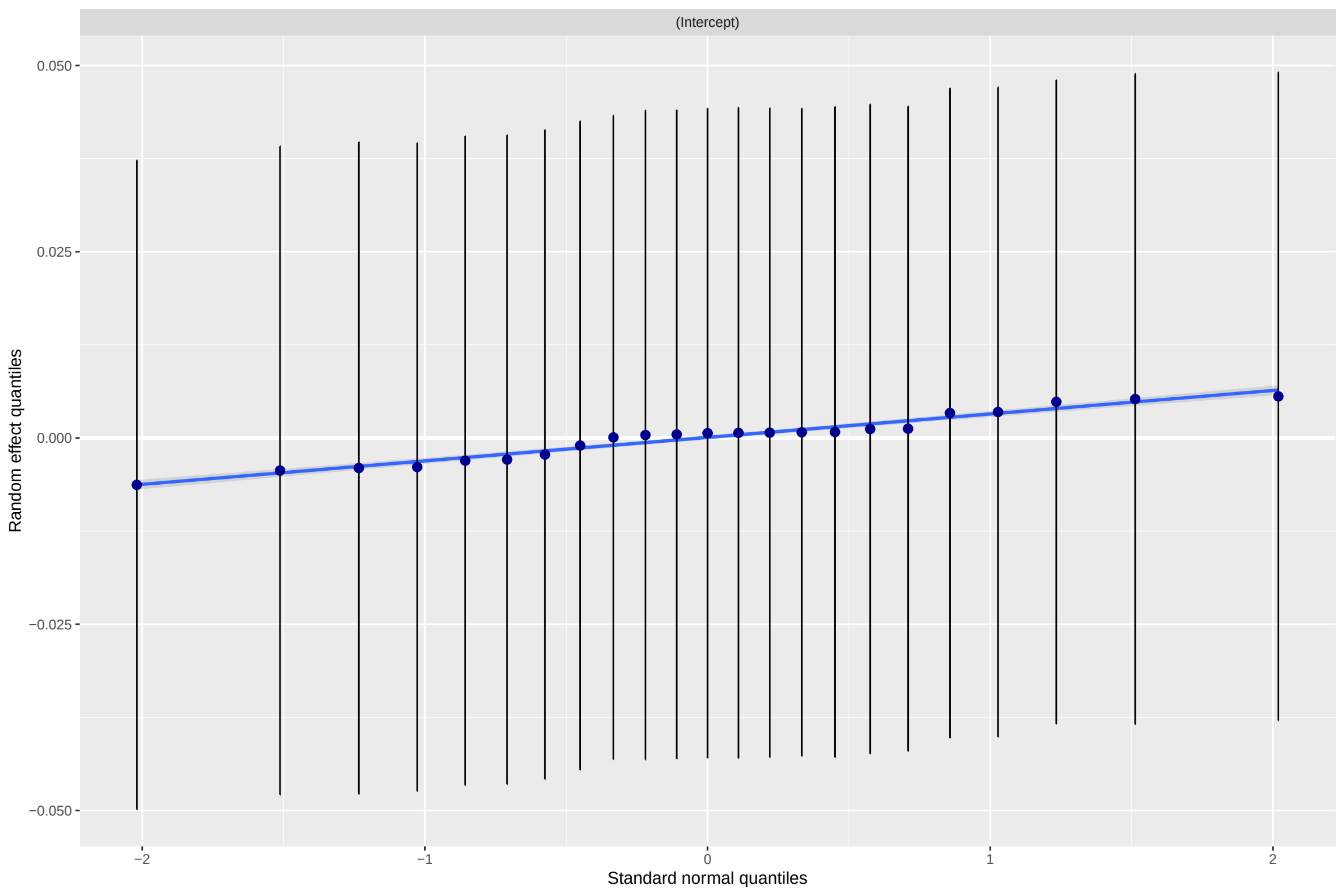
model	sigma	logLik	AIC	BIC	deviance	df.residual
location_exposure + log_days_since_last_haul	1.00	−663.21	1338.42	1360.78	280.12	301.00
log_days_since_last_haul	1.00	−664.50	1339.00	1357.64	282.98	302.00
design + location_exposure + log_days_since_last_haul	1.00	−662.83	1339.67	1365.76	279.99	300.00
location_exposure	1.00	−665.16	1340.33	1358.96	276.08	302.00

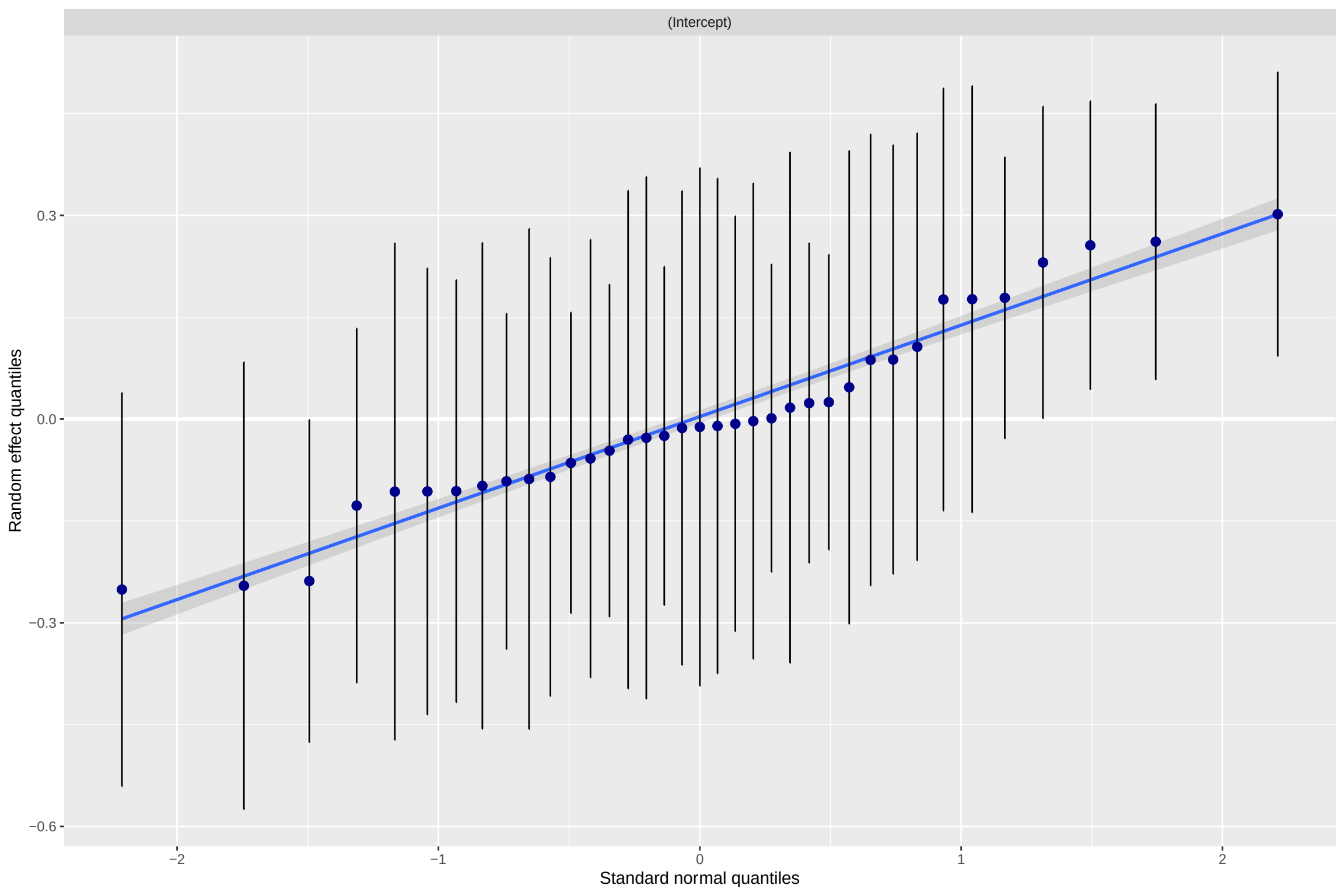

Predicting number of species in trap haul
location_exposureWindward
log_days_since_last_haul
designZ
−0.50
−0.25
0.00
0.25
Coefficient estimate
Fixed coefficients in model
(highest to lowest AIC)
location_exposure
design + location_exposure + log_days_since_last_haul
log_days_since_last_haul
location_exposure + log_days_since_last_haul

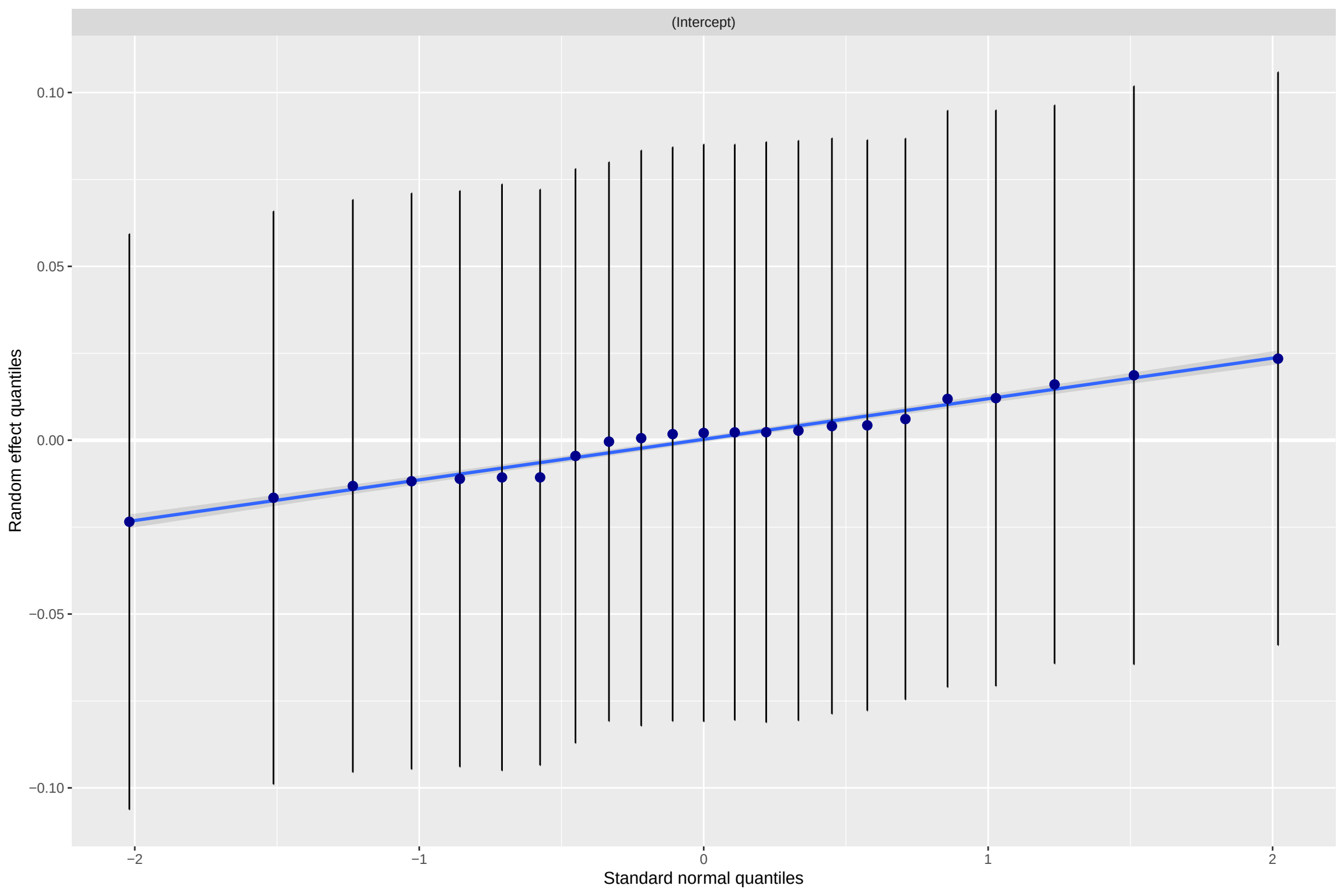

(Intercept)
Random effect quantiles
0.3
0.0
−0.3
−0.6
−2
−1
0
1
2
Standard normal quantiles

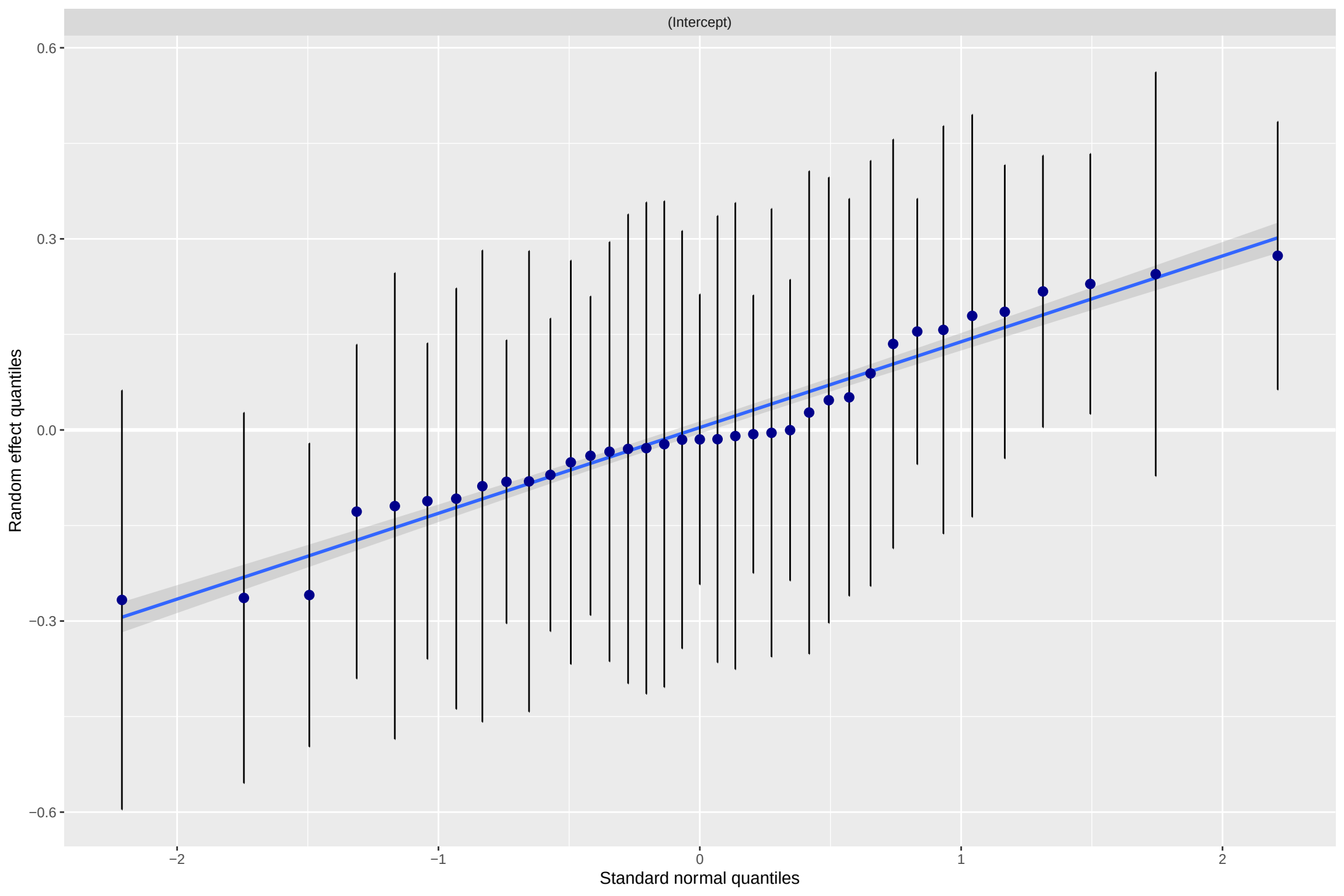

(Intercept)
0.10
0.05
0.00
−0.05
−0.10
Random effect quantiles
−2
−1
0
1
2
Standard normal quantiles

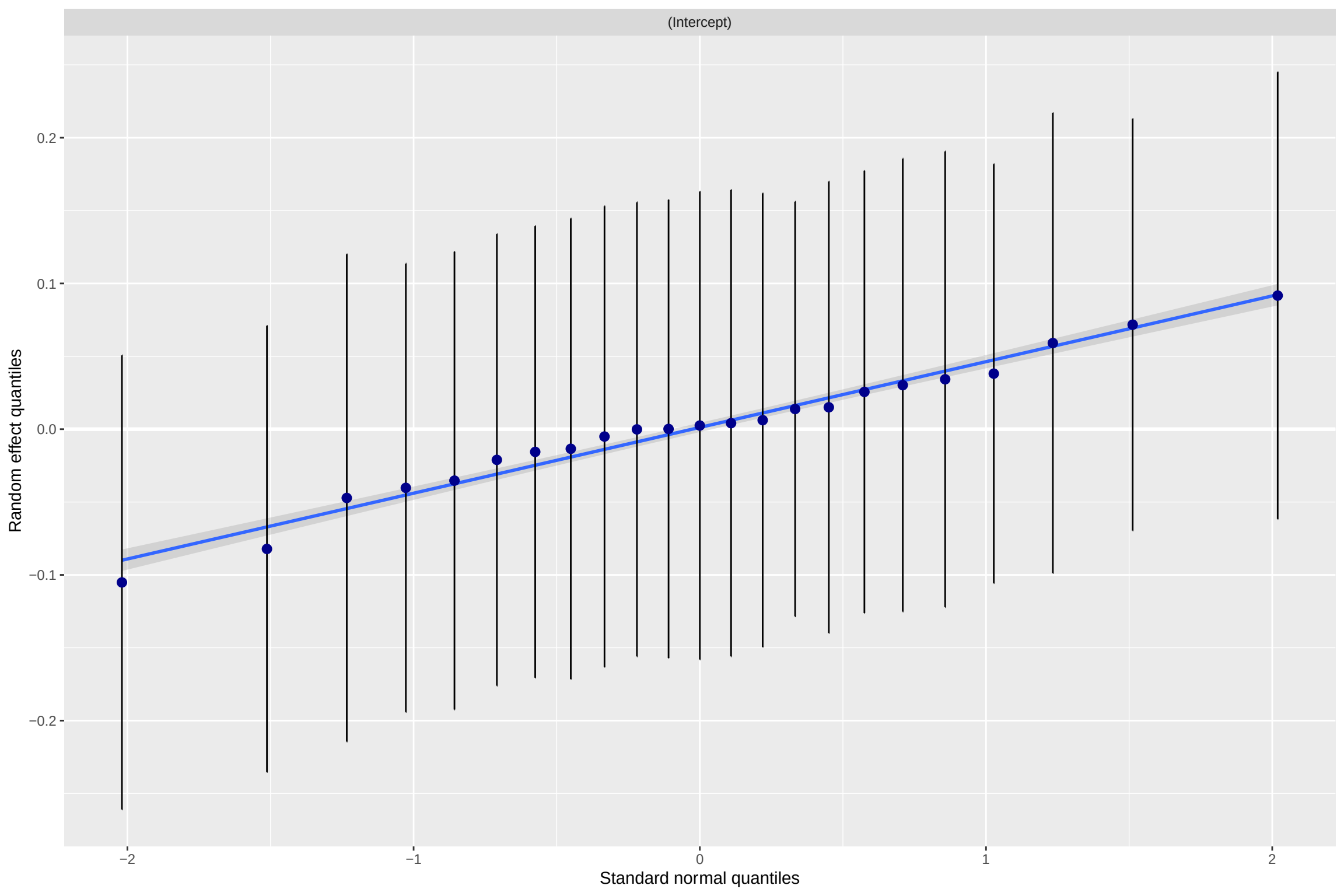

(Intercept)
Random effect quantiles
0.6
0.3
0.0
−0.3
−0.6
−2
−1
0
1
2
Standard normal quantiles


(Intercept)
0.050
0.025
0.000
−0.025
−0.050
Random effect quantiles
−2
−1
0
1
2
Standard normal quantiles


(Intercept)
Random effect quantiles
0.3
0.0
−0.3
−0.6
−2
−1
0
1
2
Standard normal quantiles


(Intercept)
0.10
0.05
0.00
−0.05
−0.10
Random effect quantiles
−2
−1
0
1
2
Standard normal quantiles


(Intercept)
0.6
0.3
0.0
−0.3
−0.6
Random effect quantiles
−2
−1
0
1
2
Standard normal quantiles


(Intercept)
Random effect quantiles
0.2
0.1
0.0
−0.1
−0.2
−2
−1
0
1
2
Standard normal quantiles

Model summaries for all models with delta AIC < 2

```
$‘location_exposure + log_days_since_last_haul‘
Generalized linear mixed model fit by maximum likelihood (Laplace
  Approximation) [glmerMod]
 Family: Negative Binomial(16.5444)  ( log )
Formula: no_species ~ location_exposure + log_days_since_last_haul + (1 |
    TrapID) + (1 | Date_YMD)
   Data: trap_haul_no_zero
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 10000))

     AIC      BIC   logLik deviance df.resid
  1338.4   1360.8   −663.2   1326.4      301

Scaled residuals:
    Min      1Q  Median      3Q     Max
−1.6560 −0.7713 −0.2149  0.5611  3.5005

Random effects:
 Groups   Name        Variance Std.Dev.
 TrapID   (Intercept) 0.043175 0.20779
 Date_YMD (Intercept) 0.002062 0.04541
Number of obs: 307, groups:  TrapID, 37; Date_YMD, 23

Fixed effects:
                           Estimate Std. Error z value Pr(>|z|)
(Intercept)                 1.05669    0.14733   7.172 7.38e−13 ***
location_exposureWindward −0.23391    0.14633  −1.598   0.1099
log_days_since_last_haul   0.12248    0.05829   2.101   0.0356 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Correlation of Fixed Effects:
            (Intr) lctn_W
lctn_xpsrWn −0.112
lg_dys_sn__ −0.919 −0.030

$log_days_since_last_haul
Generalized linear mixed model fit by maximum likelihood (Laplace
  Approximation) [glmerMod]
 Family: Negative Binomial(16.5444)  ( log )
Formula: no_species ~ log_days_since_last_haul + (1 | TrapID) + (1 | Date_YMD)
   Data: trap_haul_no_zero
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 10000))

     AIC      BIC   logLik deviance df.resid
  1339.0   1357.6   −664.5   1329.0      302

Scaled residuals:
    Min      1Q  Median      3Q     Max
−1.6621 −0.7690 −0.2211  0.5892  3.5229

Random effects:
 Groups   Name        Variance  Std.Dev.
 TrapID   (Intercept) 0.0470660 0.21695
 Date_YMD (Intercept) 0.0005033 0.02243
Number of obs: 307, groups:  TrapID, 37; Date_YMD, 23

Fixed effects:
                           Estimate Std. Error z value Pr(>|z|)
(Intercept)                 1.02522    0.14451   7.094  1.3e−12 ***
log_days_since_last_haul  0.11996    0.05685   2.110   0.0349 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Correlation of Fixed Effects:
            (Intr)
lg_dys_sn__ −0.923

$‘design + location_exposure + log_days_since_last_haul‘
Generalized linear mixed model fit by maximum likelihood (Laplace
  Approximation) [glmerMod]
 Family: Negative Binomial(16.5444)  ( log )
Formula: no_species ~ design + location_exposure + log_days_since_last_haul +
    (1 | TrapID) + (1 | Date_YMD)
   Data: trap_haul_no_zero
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 10000))

     AIC      BIC   logLik deviance df.resid
  1339.7   1365.8   −662.8   1325.7      300

Scaled residuals:
    Min      1Q  Median      3Q     Max
−1.6321 −0.7597 −0.2046  0.5627  3.5338

Random effects:
 Groups   Name        Variance Std.Dev.
 TrapID   (Intercept) 0.042303 0.20568
 Date_YMD (Intercept) 0.001905 0.04365
Number of obs: 307, groups:  TrapID, 37; Date_YMD, 23

Fixed effects:
                           Estimate Std. Error z value Pr(>|z|)
(Intercept)                 1.18477    0.20803   5.695 1.23e−08 ***
designZ                   −0.12125    0.13971  −0.868   0.3855
location_exposureWindward −0.32548    0.17993  −1.809   0.0705 .
log_days_since_last_haul   0.10823    0.06058   1.786   0.0740 .
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Correlation of Fixed Effects:
            (Intr) designZ lctn_W
designZ     −0.703
lctn_xpsrWn −0.479  0.588
```

```
$location_exposure
Generalized linear mixed model fit by maximum likelihood (Laplace
  Approximation) [glmerMod]
 Family: Negative Binomial(16.5444)  ( log )
Formula: no_species ~ location_exposure + (1 | TrapID) + (1 | Date_YMD)
   Data: trap_haul_no_zero
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 10000))

     AIC      BIC   logLik deviance df.resid
  1340.3   1359.0   −665.2   1330.3      302

Scaled residuals:
    Min      1Q  Median      3Q     Max
−1.4954 −0.7676 −0.2365  0.5630  3.4623

Random effects:
 Groups   Name        Variance Std.Dev.
 TrapID   (Intercept) 0.042628 0.20646
 Date_YMD (Intercept) 0.008205 0.09058
Number of obs: 307, groups:  TrapID, 37; Date_YMD, 23

Fixed effects:
                           Estimate Std. Error z value Pr(>|z|)
(Intercept)                 1.33486    0.06055  22.045   <2e−16 ***
location_exposureWindward −0.23641    0.14764  −1.601    0.109
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Correlation of Fixed Effects:
            (Intr)
lctn_xpsrWn −0.332
```

Full model summary

```
Generalized linear mixed model fit by maximum likelihood (Laplace
  Approximation) [glmerMod]
 Family: Negative Binomial(16.5444)  ( log )
Formula: no_species ~ design + log_days_since_last_haul + location_exposure +
    Exp_or_Cont + (1 | TrapID) + (1 | Date_YMD)
   Data: trap_haul_no_zero
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 10000))

     AIC      BIC   logLik deviance df.resid
  1341.6   1371.5   -662.8   1325.6      299

Scaled residuals:
    Min      1Q  Median      3Q     Max
-1.6295 -0.7653 -0.2058  0.5576  3.5232

Random effects:
 Groups   Name        Variance Std.Dev.
 TrapID   (Intercept) 0.042448 0.20603
 Date_YMD (Intercept) 0.001947 0.04413
Number of obs: 307, groups:  TrapID, 37; Date_YMD, 23

Fixed effects:
                            Estimate Std. Error z value Pr(>|z|)
(Intercept)                  1.17650    0.21465   5.481 4.23e-08 ***
designZ                     -0.12192    0.14000  -0.871   0.3838
log_days_since_last_haul     0.10815    0.06070   1.782   0.0748 .
location_exposureWindward -0.32594    0.18022  -1.808   0.0705 .
Exp_or_ContExperimental     0.01673    0.10313   0.162   0.8711
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
            (Intr) desgnZ lg____ lctn_W
designZ     -0.675
lg_dys_sn__ -0.795  0.271
lctn_xpsrWn -0.462  0.588  0.137
Exp_r_CntEx -0.240 -0.029 -0.004 -0.012
```