

As suggested by MMC, this preliminary analysis redoes the Becker et al. 2011 models using years 1999-2005 (inclusive) as LOW oyster harvest years. All other methods similar to Becker et al 2011.

Quasibinomial model: Response variable is comparing Drakes Estero pups to the rest of regional colonies.

Covariates: Pups at subsite A  
 Oyster harvest high low (hi.lo.new)  
 Pups at Double Point

DATA for 1982-1983 & 1997-2009

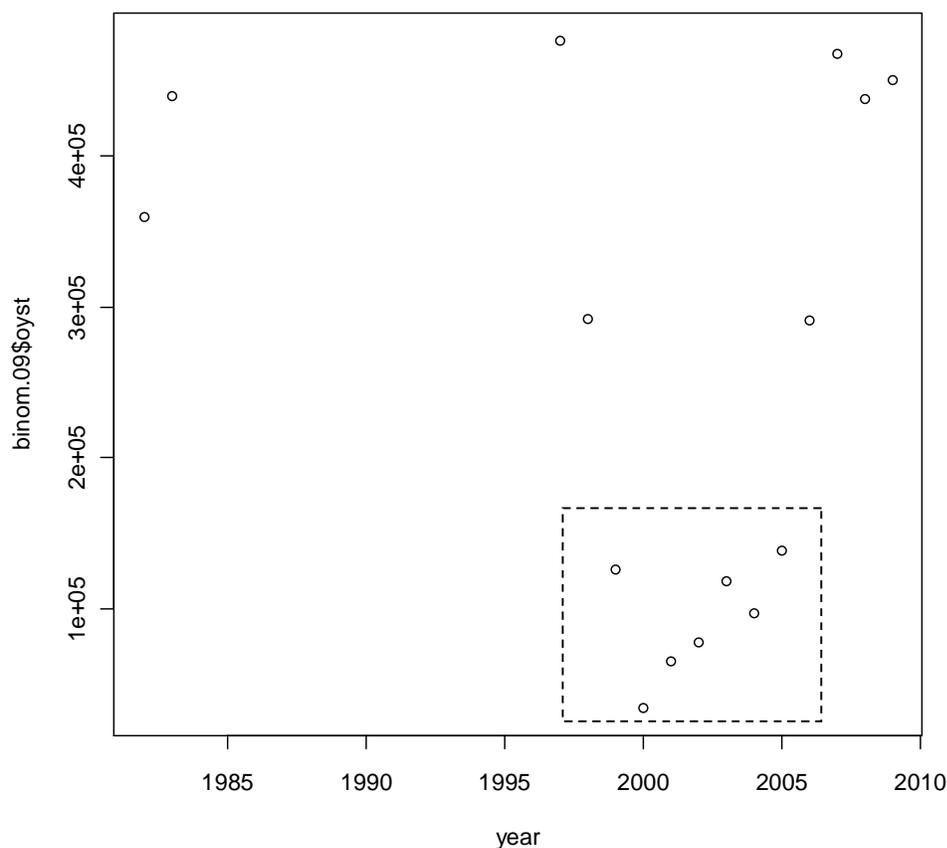


Figure 1. Oyster harvest vs year during 1982-1983 and 1997 – 2009. Points inside dashed box were considered “Low” oyster harvest years (1999-2005). Thus, the breakpoint is approximately 200,000 lbs per year. This breakpoint is identical whether using old or updated DFG harvest values.

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Box 1: R Model output: glm(formula = prop.pup ~ hi.lo.new +
pup.dp + a.max, family = quasibinomial, data = binom.09)
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Deviance Residuals:
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      Min       1Q   Median       3Q      Max
-2.8962  -1.4308   0.3681   1.0996   2.9255
```

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Coefficients:
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              Estimate Std. Error t value Pr(>|t|)
(Intercept) -0.1412542  0.1870151  -0.755  0.46593
Oyst.hi.lo  -0.2818422  0.0969023  -2.909  0.01423 *
pup.dp      -0.0016755  0.0004404  -3.804  0.00292 **
a.max        -0.0004593  0.0004016  -1.144  0.27707
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Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
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(Dispersion parameter for quasibinomial family taken to be
4.068985)
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Null deviance: 129.269 on 14 degrees of freedom
Residual deviance: 45.063 on 11 degrees of freedom
AIC: NA
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Number of Fisher Scoring iterations: 3
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Comments:

1. Note that hi.lo.new is lo oyster harvest from 1999 to 2005.
2. Oyster harvest is still significant ( $P < 0.02$ ) when looking at longer range of years as low.
3. Effects plots below are almost identical to Figure 6 in Becker et al 2011 except the effect of subsite a is a bit weaker.
4. In Becker et al. 2011, the continuous value is also the best fitting model.
5. Note that this analysis (similar to Becker et al, 2011) is looking at the proportion of seals using Drakes Estero, therefore it is not directly comparable with raw counts.
6. Based upon the updated DFG oyster harvest numbers, this "200,000 lb" breakpoint would not change the hi-lo classification of any years.
7. Model fit:  $r^2 = 0.65$

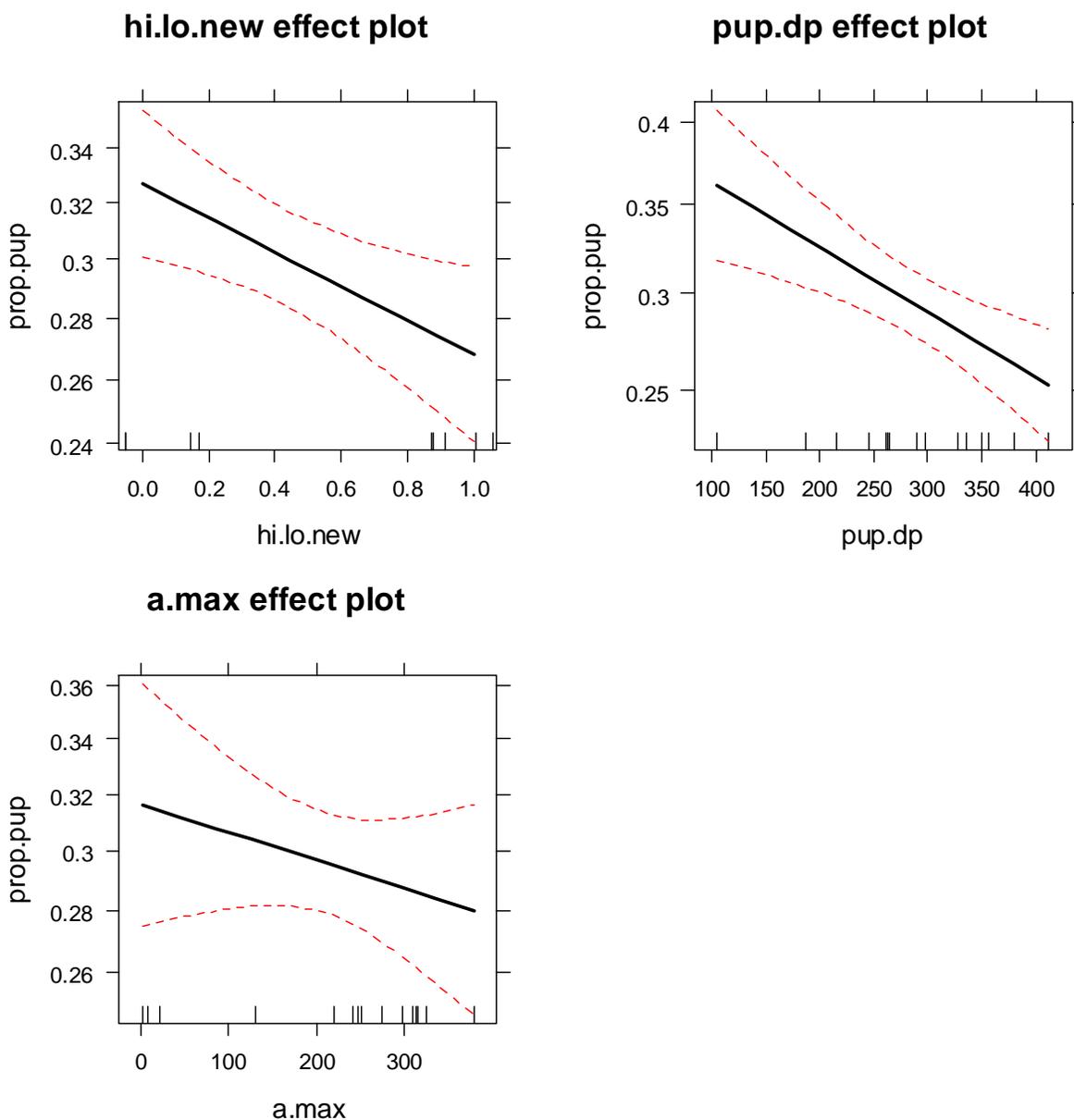


Figure 2. Plots (top left panel) show similar negative relationship between regional proportion of pups in Drakes Estero and hi versus low oyster harvest year. Double point and subsite A plots are also similar to Becker et al. 2011.

Conclusion: Reclassifying the hi-low for oyster harvest boundaries has no impact on conclusions of Becker et al. 2011 other than weakening the effect of subsite A.