

# **LPUE modeling**

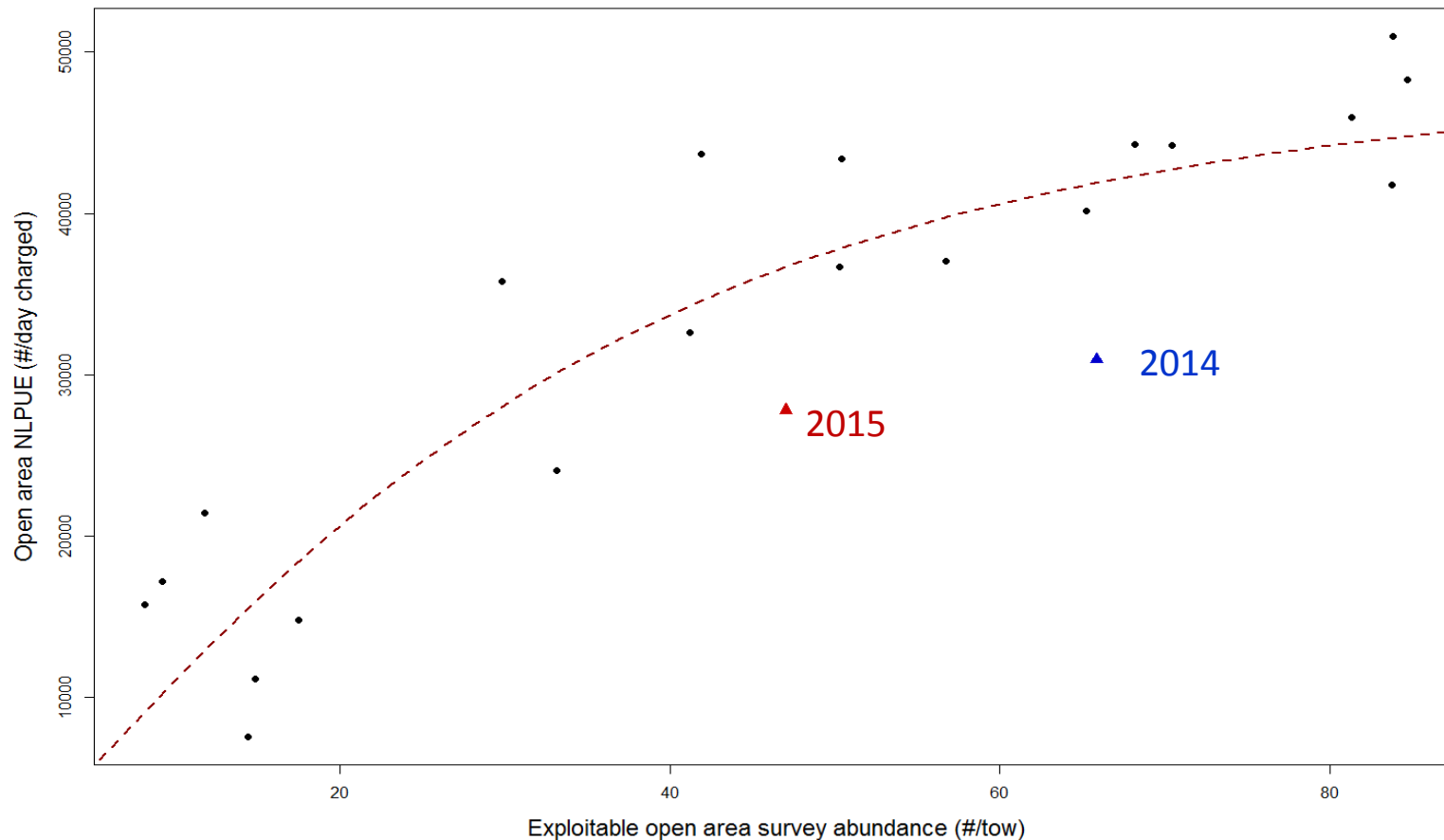
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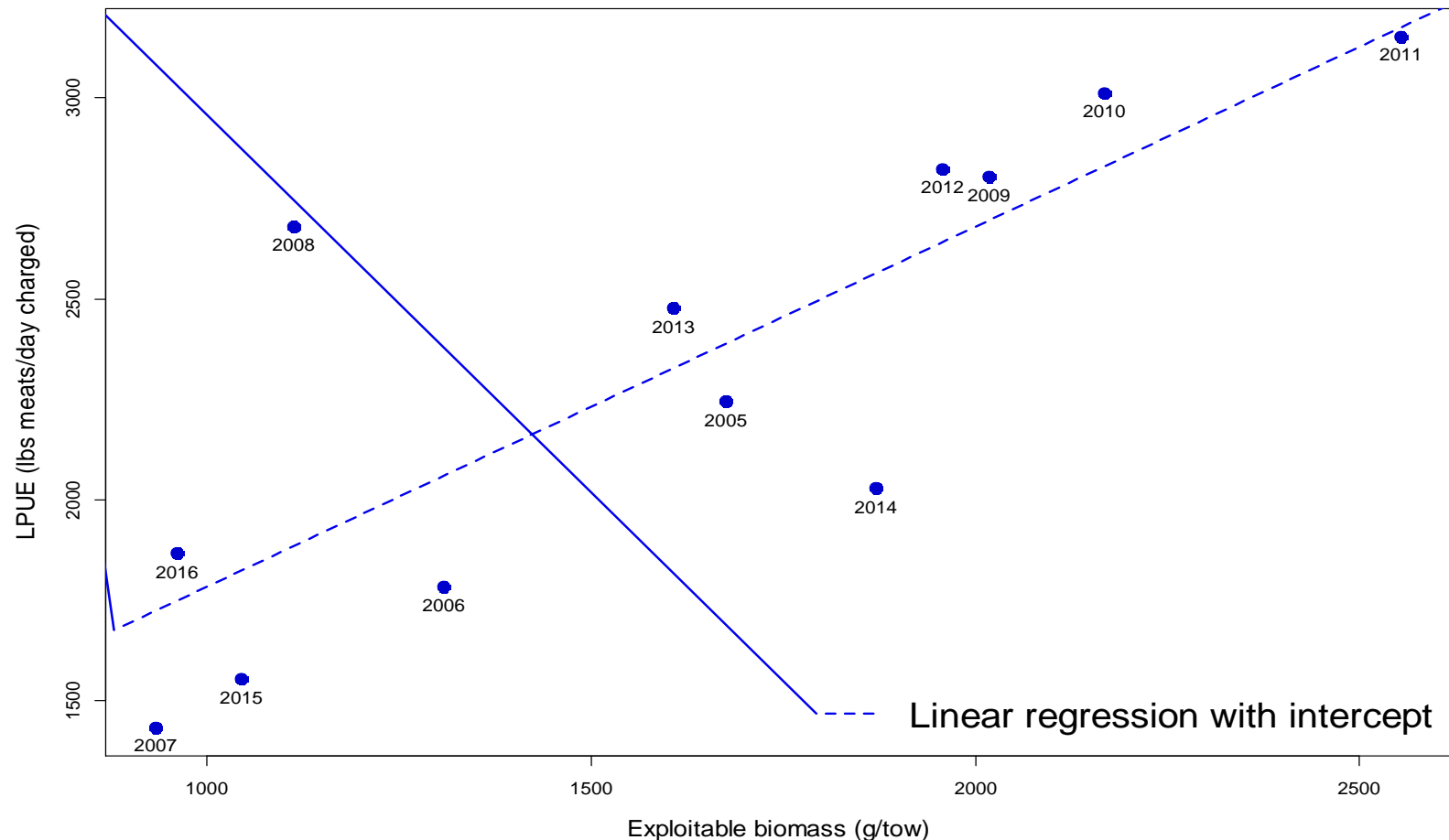
The current approach models LPUE (in numbers) as a saturating function of mean survey exploitable numbers.

This approach overestimated LPUE considerably in 2014-15, especially in 2014

Most of the non-linearity is due to the differences between the data in the 1990s and more recent years.

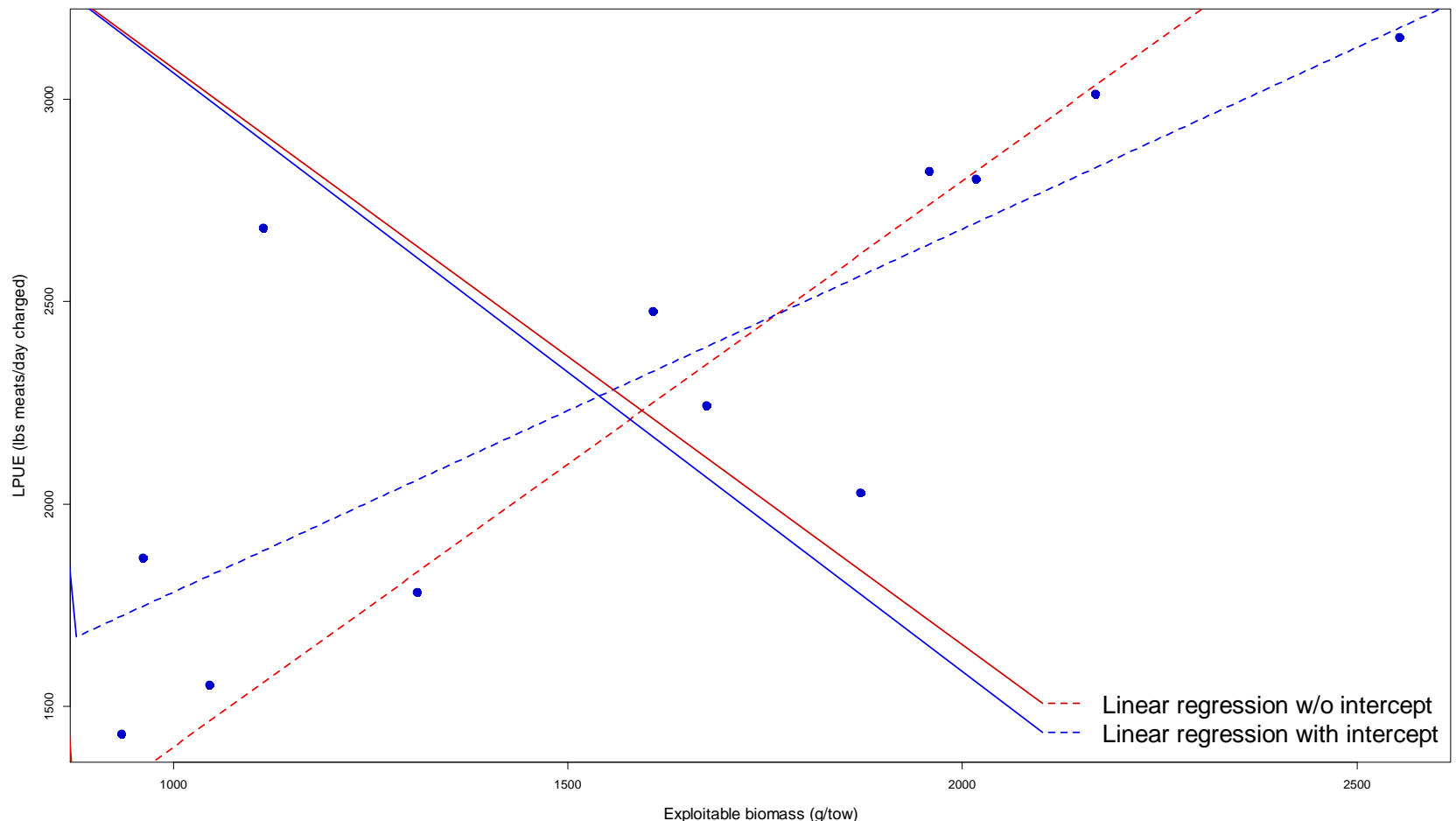


Current fishery practices are different now than before Amendment 10 was implemented in late 2004. For that reason, and because there is now sufficient post-A10 data, only data since 2004 was used in the current analysis. These data show no evidence of non-linearity between LPUE and exploitable biomass



The textbook model is given by:  $LPUE = m * ExplBms$ .

However, using an intercept in the linear regression substantially improves the fit (4 AIC points). A positive intercept is consistent with the idea that the slope is greater at low biomass. The regression with intercept has a good fit to the data with an  $adj R^2 = 0.62$



## What caused the 2008 and 2014 outliers?

One hypothesis: During 2014 (and 2015), there was more fishing on offshore Georges Bank than usual. The extra steam times for fishing offshore may have caused LPUE to be lower than expected.

Proposal: Use the new linear regression approach for predicting LPUE, potentially modified for steam time