



Cost and Benefits of Control Strategies

(COBECOS)

- the case of Norway lobster trawl fishery in Kattegat and Skagerrak

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COBECOS - project

WP 5

The objective:

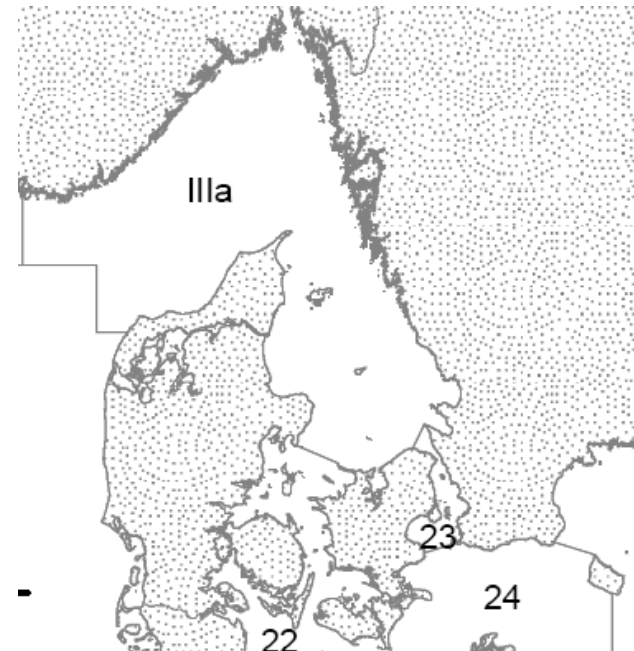
to estimate the basic relationships in the theoretical enforcement model for use in the computer model (the COBECOS-software).

Estimation of:

- **Enforcement-probability function**
- **Enforcement-cost function**
- **Benefit functions (private and social)**

Norway lobster trawl fishery in Kattegat and Skagerrak

- **Mixed trawl fishery**
- **Most important species:**
 - Norway lobster
 - Atlantic cod
 - Common sole
 - European plaice.
- **Norway lobster and Atlantic cod have a catch value more than two thirds of the total value of landings.**
- **The Danish Directorate of Fisheries risk-ranked these species to require a full enforcement effort.**





Enforcement effort

■ Enforcement effort challenges

- find a measure between 0 and 1 (required as input to the COBECOS software)
- Cross-sectional data (all landings 2005 & 2006)

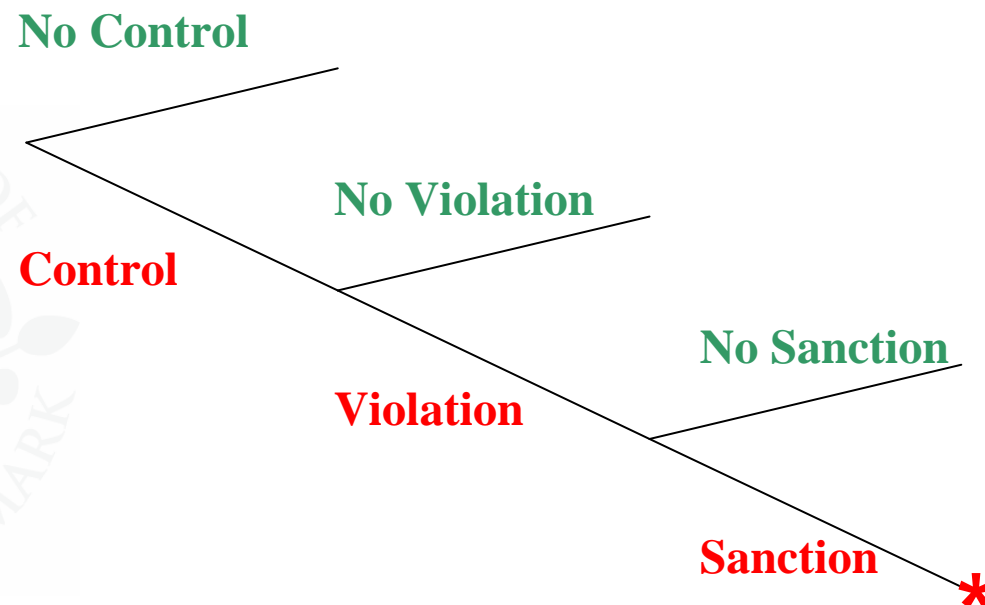
$$\text{Effort} = \frac{\# \text{ Inspections for specific vessel}}{\# \text{ Landings for a specific vessel}}$$

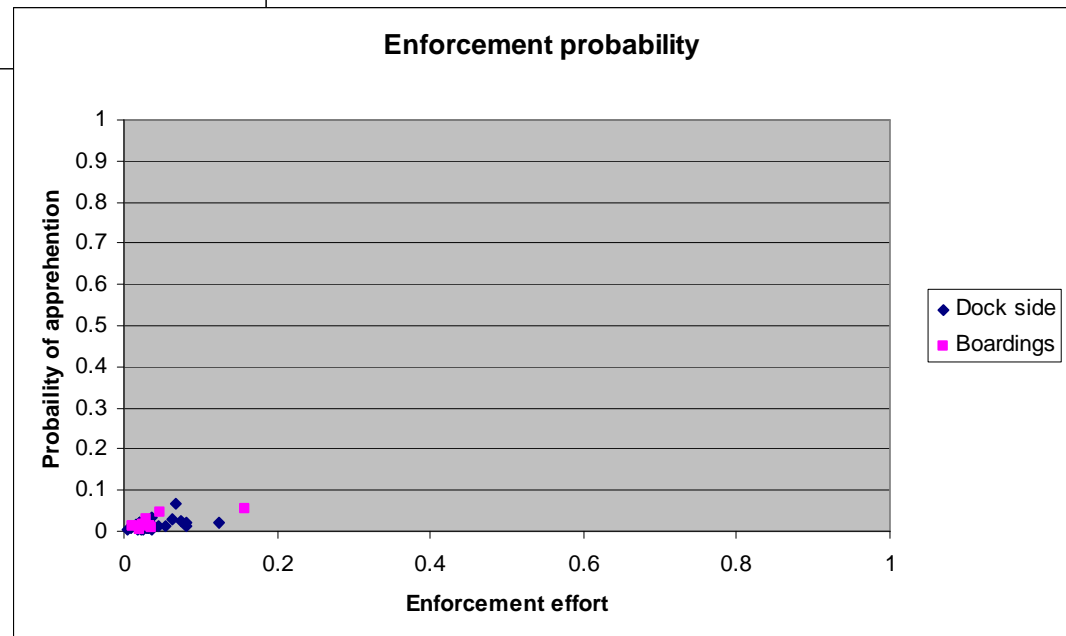
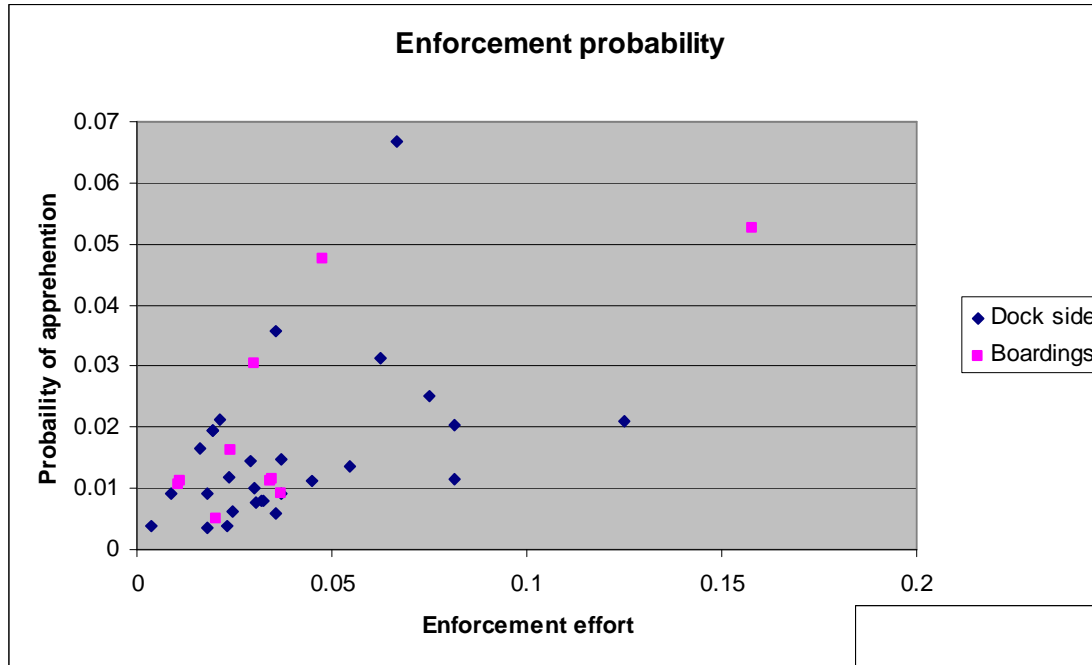


Probability of apprehension

■ A probability tree

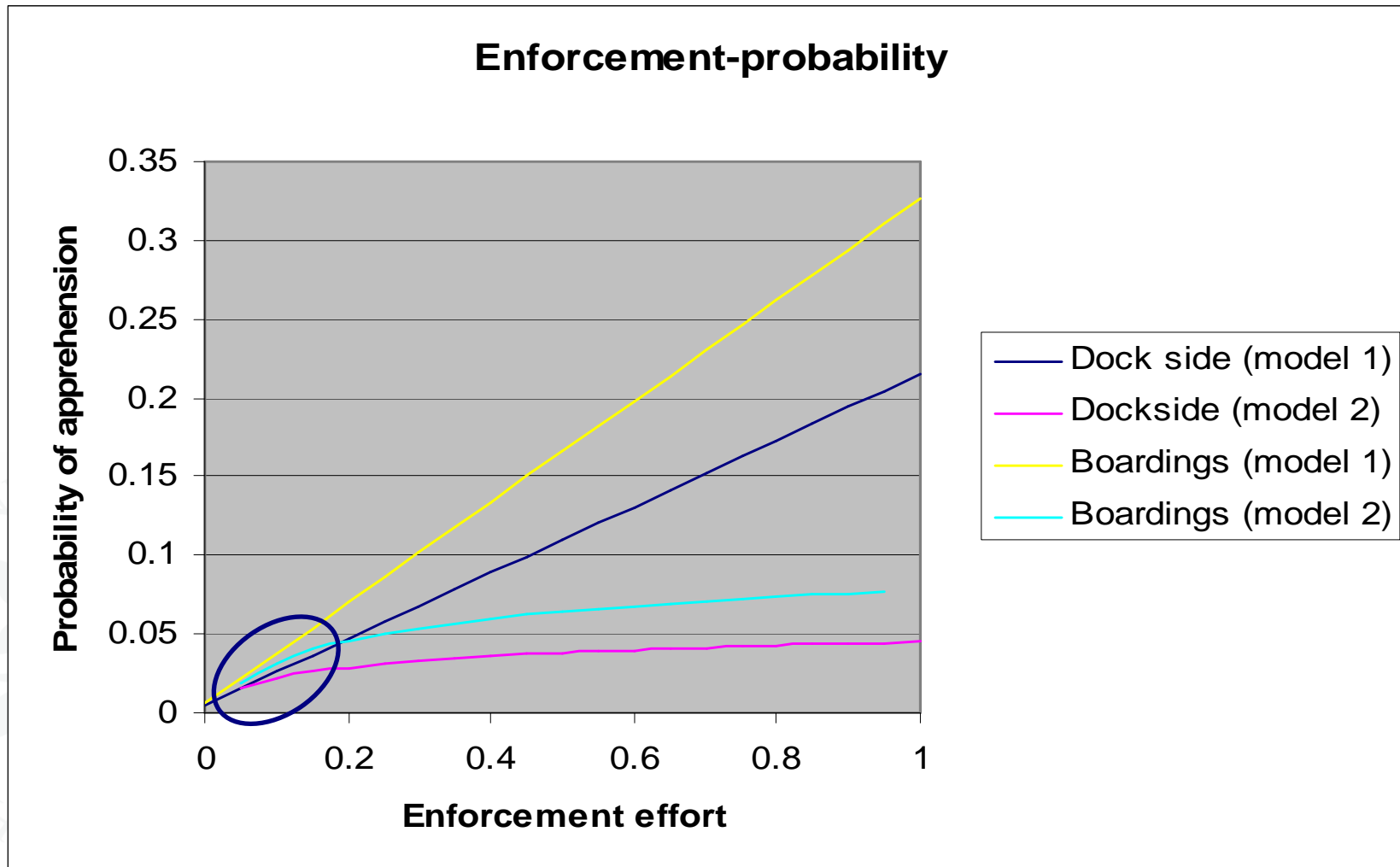
- Control/No Control
- Violation/No Violation
- Sanction/No Sanction





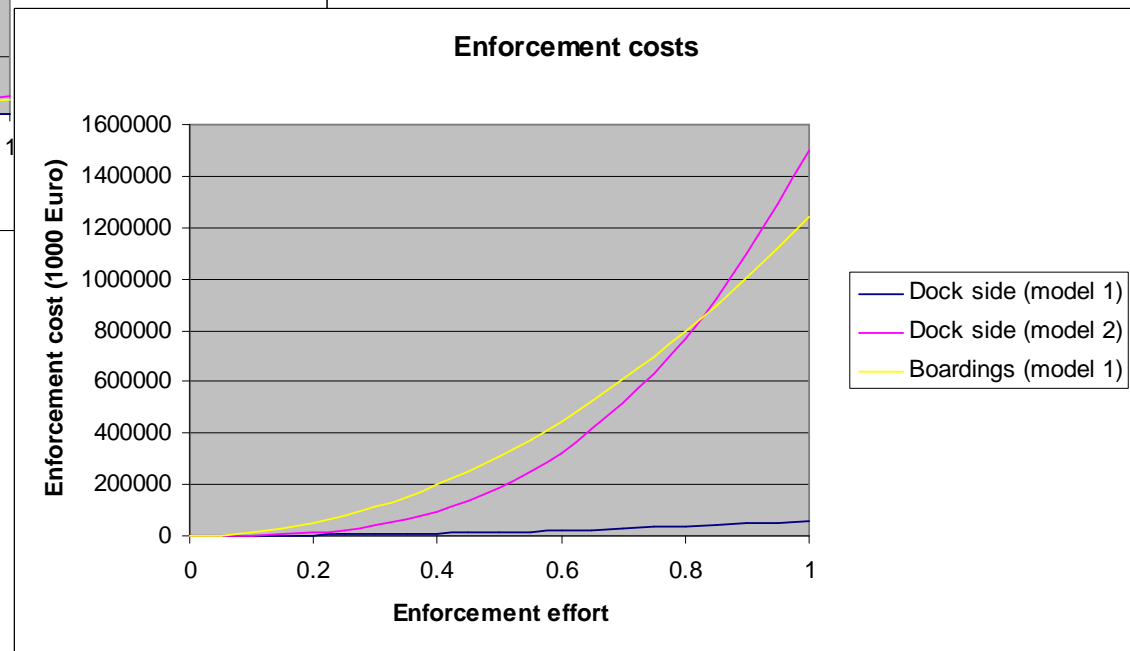
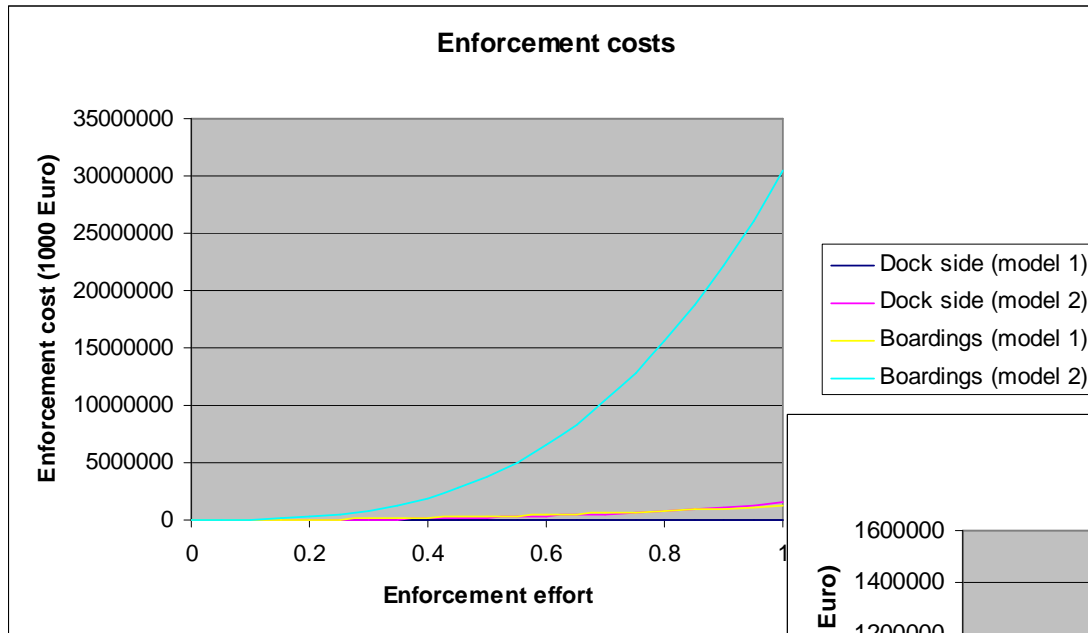


Enforcement probability function





Enforcement costs functions





Benefit functions

- **Based on an existing model (NECESSITY) we estimated the shadow values of biomass for cod and nephrops.**
- **We apply information on prices and costs to find remaining parameters in the private and social benefit functions respectively.**



General Challenges

- **Non-random enforcement effort.**
- **Only information about apprehended violators.**
- **Extrapolation is necessary to define the enforcement probability function.**
- **Application of actual, and not perceived, probabilities.**



Case Specific Challenges

- **Defining what enforcement effort is and rescale it btw 0 and 1 for the COBECOS software.**
- **Cross sectional enforcement data.**
- **Extremely limited enforcement cost information.**
- **Regulatory measure for nephrops are minimum landing => redefine this regulatory measure to be measurable as a TAC.**