The Flemish *Nephrops* fisheries: revival of a lucrative fishery method!

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*Nephrops* TV-surveys: purpose, methodology, results and management outcomes

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Cefas
Starting point of UWTV surveys

- Lack of age-structured data
- Differences in growth rates of males and females
- Catchability due to the biology (life cycle)
- Uncertain historic landings for a number of stocks (improved since the introduction of buyers and sellers legislation UK – 2005 & 2006)

Standard stock assessments methods, based on commercial catch data – difficult to apply

Under water TV surveys fishery – independent indicators of stock size, exploitation status and catch advice
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Distribution of UWTV surveys

UWTV surveys listed regularly in 15 ICES FU

ICES, 2008
UWTV Surveys - methodology

1. Training pre-survey
   - Burrow identification
   - Reference counts

2. Recording footage
   - Sledge mounted camera

3. Recounts
What is a Nephrops burrow?
What isn’t a Nephrops burrow?
What is a burrow system?

1. Crescentiform entrance
2. Sediment ejecta and radial scrapings around entrance. Claw or pereiopod indents. ‘Drive-way’
3. Single to multiple entrances, focussing on an apparent ‘raised’ centrum
4. *Nephrops norvegicus*
Crescentiform entrances
Sediment ejecta
Single to multiple entrances
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The smaller the entrance, the harder it is to spot signatures
Other species

**IF IN DOUBT LEAVE IT OUT**
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Individual’s counting performance against the reference counts as measured by Linn’s concordance correlation coefficient (CCC)
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- 10 minute run
- *count 7 clear minutes only*
- *Blind counts*
- *2 counters for each station*

**Burrow counts**

- Converted into densities
  (width of view + tow length)
- Raised to fishing ground area

+ Estimation of overall abundance

Each system is assumed to represent one catchable *Nephrops* with occupancy assumed to be 100%
UWTV Surveys – results (e.g. Farn Deeps, geo-statistical analysis)
UWTV Surveys - sources of bias

- Misidentification of *Nephrops* burrows
- High density of burrows
- Edge effects, clarity
- Variability of the counters

At 2009 ICES Benchmark the main sources of bias were estimated for each FU and an overall bias correction factor was introduced adjusting the estimates of abundance.
Nephrops TV surveys
Nephrops catch sampling programme

ICES WORKING GROUPS

- Fishery independent estimate of stock size
- Exploitation status
- Catch advice

Set annual TAC

ICES management for the North Sea, 2010
Management should be at the FU rather than at the ICES sub-area level, as Nephrops densities vary throughout the different grounds and sediment strata as showed by the UWTV survey results.
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