

The WGEF Approach to assessing data-poor elasmobranch stocks

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ICES Elasmobranch Stocks

- Deepwater sharks
 - *Centrophorus squamosus*
 - *Centroscymnus coelolepis*
- Pelagic sharks
 - *Squalus acanthias*
 - *Lamna nasus*
 - *Isurus oxyrinchus*. . . .
- “Demersal Elasmobranchs”, by ecoregion

Demersal elasmobranchs

- Barents Sea
- Norwegian Sea
- Faroe Islands
- Iceland and East Greenland
- North Sea
- Celtic Seas
- Biscay and Iberia
- Azores and mid-Atlantic ridge

Demersal Elasmobranchs - Species

- Rajidae
 - *Raja clavata*
 - *Leucoraja naevus*
 - *Raja microocellata*
 - *Raja brachyura*
 - *Raja asterias*
 - *Dipturus spp*
 - *Etc.....*
- Small sharks
 - *Scyliorhinus canicula*
 - *Mustelus spp.*
 - *Galeus melastoma*
 - *Etc.....*

Demersal elasmobranchs – Assessment Problems

- Mixed fisheries
- Mixture of target and bycatch species
- Different gears
- Different behaviours

Assessment methods

- Full assessment, F_{MSY} calculated:
 - *Squalus acanthias*
- Limited assessment, with some reference points
 - *Lamna nasus*
- No reference points
 - All others

Methodology for Most Stocks

- Survey information (with a time series requirement)
 - Distribution
 - Abundance

- Commercial information
 - CPUE

Example – Demersal Elasmobranchs in the Celtic Seas

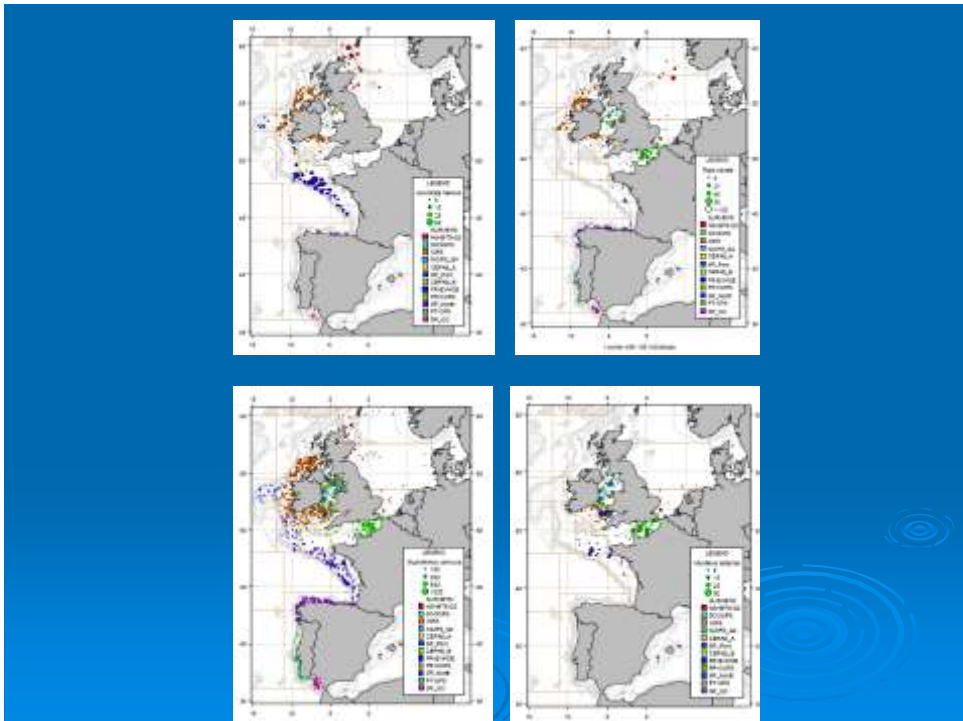
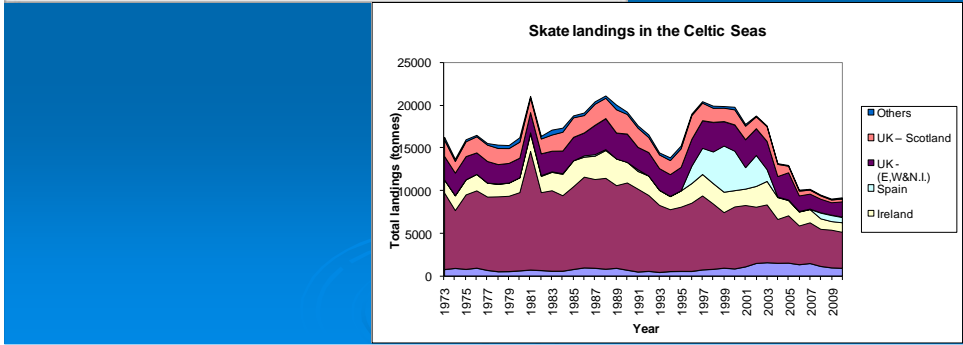
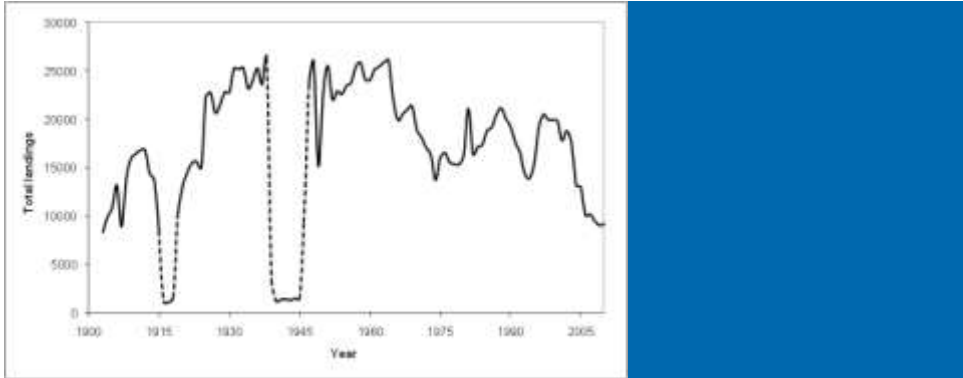


Example – Demersal Elasmobranchs in the Celtic Seas

- 4 main ray species:
 - *R. clavata*
 - *R. brachyura*
 - *R. montagui*
 - *L. naevus*
- *Dipturus spp.* Extirpated in Irish Sea, still found in other areas.
- *R. undulata*, *Squatina squatina*, patchily distributed but may be locally abundant
- *Scyliorhinus canicula* main small shark.

Demersal Elasmobranchs in the Celtic Seas continued

- Main Data Sources
 - International Bottom Trawl Survey
 - Other surveys (England, Scotland,)
 - Commercial CPUE (mainly France)
 - Landings trends





Scyliorhinus canicula
Spanish Porcupine
survey 2001-2010

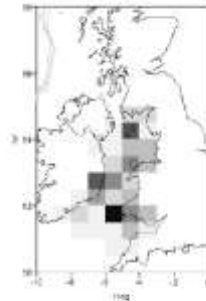
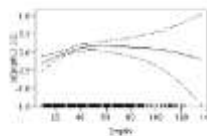
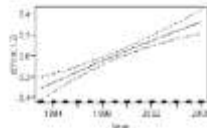
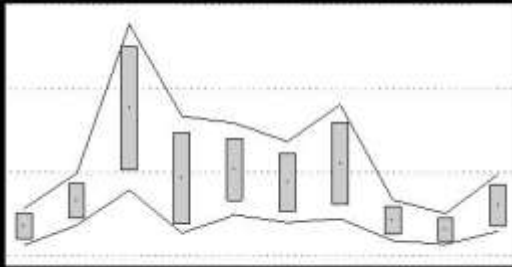


Figure 5.4.37.4 *Scyliorhinus canicula* in Divisao VIa. Estimated effects (year, month, depth and statistical rectangles) from the GAM analysis of Scottish survey data (log scale). Model: see for 2010.



Leucoraja naevus
Spanish Porcupine Survey
2001-2010

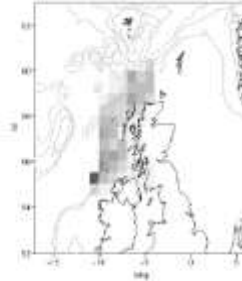
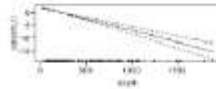
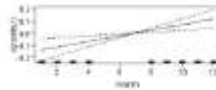
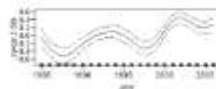
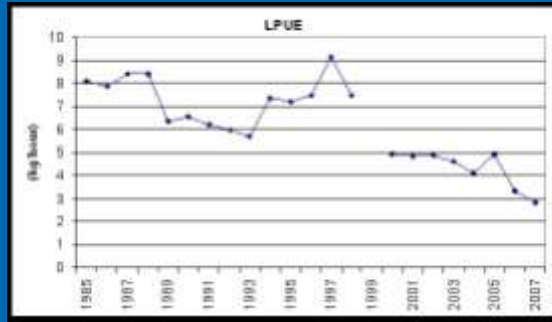


Figure 5.4.37.4 *Leucoraja naevus* in Divisao VIa. Estimated effects (year, month, depth and statistical rectangles) from the GAM analysis of Scottish survey data (log scale). Model: see for 2010.



Leucoraja naevus – French commercial LPUE

Individual Stock Status

Species	Area	State of stock
Common skate complex	VI	Depleted. The stock likely extends into IIa and IVa
	VII	Depleted. Near extirpated from the Irish Sea (VIIa)
<i>R. clavata</i> (thornback ray)	VI	Stable/increasing.
	VIIa,f,g	Stable/increasing.
	VIIe	Uncertain
<i>R. montagu</i> (spotted ray).	VI	Stable/increasing.
	VIIa,f,g	Stable/increasing.
	VIIe	Uncertain
<i>L. naevus</i> (cuckoo ray)	VI	Uncertain. The stock area is not known, and may merge with sub-areas IV and VII. Survey catches in VIa are increasing.
	VII	Uncertain. The stock area is not known, and may merge with sub-areas VI and VIII. French LPUE in the Celtic Sea has declined. Survey catches appear stable
<i>R. brachyura</i> (blonde ray)	VIa	Uncertain. No trends are apparent from surveys.
	VIIa	Uncertain. No trends are apparent from surveys.
	VIIe	Uncertain
	VIIIf	Uncertain. No trends are apparent from surveys.
<i>R. undulata</i> (undulate ray)	VIIj	Uncertain. Locally common in discrete areas.
	VIIId,e	Uncertain. Locally common in discrete areas.
<i>R. microocellata</i> (small-eyed ray)	VIIIf	Stable/increasing.
<i>L. circularis</i> (sandy ray)	VI	Uncertain.
	VIIbc,h-k	Uncertain – stable/increasing in VIIj
<i>R. fullonica</i> (shagreen ray)	VI	Uncertain. There is a poor signal from surveys for this species.
	VIIbc,g-k	Uncertain. There is a poor signal from surveys for this species.

Individual Stock Advice

Advice for 2011 and 2012 by individual stocks

Species	Area	Advice
Common skate complex (= D. borei, which has recently been differentiated into D. flexuosa and D. isomaculata, see Additional Considerations)	VI VII	No targeted fishery No targeted fishery
<i>R. cf. omara</i> (thornback ray)	VI	Status quo catch
	VIIa, f, g	Status quo catch
	VIIe	Status quo catch
<i>R. microlepis</i> (spotted ray)	VI	Status quo catch
	VIIa, f, g	Status quo catch
	VIIe	Status quo catch
<i>L. nasutus</i> (raskoo ray)	VI	Reduce from recent catch level
	VII	Reduce from recent catch level
<i>R. brachyura</i> (blonde ray)	VIa	No advice
	VIb	No advice
	VIIe	No advice
	VIIIf	No advice
<i>R. undulata</i> (sandlance ray)	VIIj	No targeted fishery
	VIIIa, s	No targeted fishery
<i>R. microocellata</i> (small-eyed ray)	VIIIf	Status quo catch
<i>L. circulator</i> (sandy ray)	VI	No advice
	VIIb, h, k	No advice
<i>R. allstonae</i> (slagreen ray)	VI	No advice
	VIIb, g, k	No advice
<i>Etmopterus oxycrinus</i> (long-nose skate)	VI-VII	No advice
<i>Etmopterus noronhaiensis</i> (Norwegian skate)	VI	No advice
<i>S. canaliculatus</i> (lemon spotted dogfish)	VI and VII	Status quo catch
<i>S. znoellera</i> (greater spotted dogfish)	VIIa, s, f	No advice
<i>Macrurus</i> spp. (crabfoot-hounds)	VII	Status quo catch
<i>Squalius squarrosus</i> (large shark)	VI, VII	Return on prohibited species list
<i>Alopias squatinus</i> (w. lobe skate)	VII	Return on prohibited species list

Advice

- Based on assessment of most vulnerable species
- EXCLUDING
 - Those that are so rare as to be unlikely to be caught e.g. *Raja undulata*

Celtic Seas advice

Skates and Rays	
Management Objective (s)	Landings in 2011 and 2012
Transition to an MSY approach with caution at low stock size	Less than 9.9 thousand t for the main species
Cautionously avoid impaired recruitment (Precautionary Approach)	No target fishery on <i>Raja undulata</i> and <i>Dipturus batis</i> complex
Cautionously avoid impaired recruitment and achieve other objective(s) of a management plan (e.g., catch stability)	n/a

<i>Scyliorhinus canicula</i> (Lesser-spotted dogfish)	
Management Objective (s)	Landings in 2011 and 2012
Transition to an MSY approach with caution at low stock size	Maintain catch at recent level
Cautionously avoid impaired recruitment (Precautionary Approach)	Maintain catch at recent level
Cautionously avoid impaired recruitment and achieve other objective(s) of a management plan (e.g., catch stability)	n/a

There is no TAC in place for *Scyliorhinus canicula*.

Other Advice Recommendations

- EU prohibited species list
- Zero TAC
- Minimum/maximum landing size