5.4.39 Demersal elasmobranchs in the Celtic Seas (ICES Areas VI, VIIa–c, e–k)

State of the stocks

In the absence of defined reference points, the status of the stocks of demersal skates and rays and demersal sharks cannot be evaluated. The following provides a qualitative summary of the general status of the major species based on survey and landings data.

Landings of skates and rays in the Celtic Seas have generally declined (Figure 5.4.39.1). There have been regional changes in species composition and indices of relative abundance.

Species	Scientific name	Area[1]	State of stock
Common skate	*Dipturus batis*	VI	Depleted
		VII	
Thornback ray	*Raja clavata*	VIa	Stable/increasing
		VIIa,f,g	
Spotted ray	*Raja montagui*	VIa	Stable/increasing
		VIIa,f,g	
Cuckoo ray	*Leucoraja naevus*	VIa	Stable/increasing
		VII	Uncertain
Blonde ray	*Raja brachyura*	VIa, VIIa and VIIf	Uncertain
Undulate ray	*Raja undulata*	VIIj (Tralee Bay) and VIIde	Uncertain (but with cause for concern)
Smalleyed ray	*Raja microocellata*	VIIf	Stable/increasing
Sandy ray	*Leucoraja circularis*	VI	Uncertain
		VIIb,c,h–k	Stable/increasing
Shagreen ray	*Leucoraja fullonica*	VII	Uncertain
White skate	*Rostroraja alba*	VII	Severely depleted
Lesser spotted dogfish	*Scyliorhinus canicula*	VIa and VII	Stable/increasing
Greater spotted dogfish	*Scyliorhinus stellaris*	VII	Locally stable and increasing in VIIa
Smooth hounds	*Mustelus mustelus* and *Mustelus asterias*	VII	Stable/Increasing
Angel shark	*Squatina squatina*	VII	Severely depleted

[1] There is insufficient information to assess the status of stocks in the Rockall area (Division VIb).

Skates and rays

Common skate Depleted. It was formerly widely distributed in the Irish Sea (VIIa), but is now rarely found in this division. Now mostly found off Northwest Scotland (VIa), west of Ireland (VIIb,c), and in the deeper waters of the Celtic Sea (VIIg–j), with occasional individuals in shallower areas (VIIe–f).

Thornback ray Stable/increasing. Catches in the main areas of abundance (VIa, VIIa,f,g) have been stable/increasing in recent years (Figures 5.4.39.2 and 5.4.39.3).

Spotted ray Stable/increasing. Catches in the main areas of abundance (VIa, VIIa,f,g) have been stable/increasing in recent years (Figures 5.4.39.4 and 5.4.39.5).

Cuckoo ray Uncertain and more robust studies on stock identity are required. Data from surveys give contrasting signals (Figures 5.4.39.6, 5.4.39.7, and 5.4.39.8), showing stable/increasing catches in VIa, but stable or declining catches within Subarea VII. French lpue in the Celtic Sea is also declining (Figure 5.4.39.9).

Blonde ray Uncertain. This species has a patchy distribution in the Celtic Seas ecoregion, so interpretation of survey trends is problematic.

Undulate ray Uncertain. Given that this large-bodied species has a patchy distribution in the inshore waters of the Celtic Seas ecoregion, it is susceptible to localized over-exploitation.

Smalleyed ray Stable/increasing. Catches in the main area of the stock distribution (VIIf) have been stable/increasing over the survey time-series (Figure 5.4.39.10).

Sandy ray Uncertain. This offshore species is not well sampled in most groundfish surveys. Catches on the Porcupine Bank have been stable/increasing in recent years (Figure 5.4.39.11).

Shagreen ray Uncertain. This offshore species is not well sampled in most groundfish surveys.

White skate Severely depleted and possibly extirpated from most parts of this ecoregion. No authenticated records in recent groundfish surveys.

Demersal sharks

Lesser spotted dogfish – Stable/increasing in all areas (Figures 5.4.39.12, 5.4.39.13, and 5.4.39.14).

Greater spotted dogfish – Stable/increasing in localized areas (e.g. off Northwest Wales) (Figure 5.4.39.15), but not well sampled by existing surveys, as it prefers rocky, inshore grounds, which are not sampled effectively in most surveys.

Smoothhounds Abundance seems to have been increasing in recent years both in survey catches (Figure 5.4.39.16) and in commercial/recreational fisheries, but the stock status is very uncertain. Identification by species is considered unreliable in the surveys.

Angel shark Severely depleted and possibly extirpated from parts of its former range where it was once common, including Start Bay (VIIe) and Cardigan Bay (VIIa).

Management objectives

Management objectives have not been adopted. An European sharks action plan was published by the European Commission in December 2007 and went out for consultation in 2008.

Reference points

Not defined.

Single-stock exploitation boundaries

No fisheries *– Species where indicators show extirpation*

White skate – has a localized and patchy distribution, and is extirpated from most parts of the Celtic Seas ecoregion. It should receive the highest possible protection. Any incidental bycatch should not be landed, but returned, to the sea, as they are likely to have a high survival rate.

Angel shark – has a localized and patchy distribution, and is extirpated from parts of its former range. It should receive the highest possible protection. Any incidental bycatch should not be landed, but returned, to the sea, as they are likely to have a high survival rate.

No target fisheries *– Species where indicators show depletion (or may be susceptible to local depletion)*

Common skate – has declined in many inshore areas of England and Wales, although is still present in the inshore areas of Scotland and Ireland. Target fisheries for this species should not be permitted and measures should be taken to minimize bycatch.

Undulate ray – has a patchy distribution, with some of these areas showing signs of depletion. As a precautionary measure, target fisheries for this species should not be permitted unless exploitation rates are shown to be sustainable.

Status quo catch *– Species where indicators show recent stability or increase*

Thornback ray, spotted ray in VIa and VIIa,f,g. and cuckoo ray in VIa.

Smalleyed ray in VIIf – has a restricted distribution and is locally abundant in the Bristol Channel, this stock should be monitored to ensure that it does not decline.

Lesser spotted dogfish – the current exploitation rates appear to be sustainable. As there are no apparent detrimental impacts on the stock from current commercial fisheries, no management actions are required for this species at this time.

Greater spotted dogfish –has a restricted distribution and is locally abundant in parts of the Celtic Seas ecoregion, and should be monitored appropriately.

Smoothhounds –have a relatively higher productivity than similar elasmobranchs and can probably sustain fisheries. Management measures should prevent overexploitation. Fisheries should only expand when accompanying measures lead to improved data collection and biological studies to ensure its sustainable harvest.

No advice *– Species where indicators are unknown*

Cuckoo ray in VII – Further studies to better understand stock structure are required, although this species is one of the more abundant skates in the Celtic Seas ecoregion.

Blonde ray – is widely distributed in the Celtic Seas ecoregion, but it has a tendency to form local aggregations and so may be prone to localized depletions.

Sandy ray – most abundant on the outer continental shelf and upper continental slope, it is not well sampled in most existing groundfish surveys.

Shagreen ray – most abundant on the outer continental shelf and upper continental slope, it is not well sampled in most existing groundfish surveys.

Management considerations

Celtic Seas demersal elasmobranchs are normally landed as a bycatch in the demersal fisheries for teleosts, with localized targeted fisheries. They are usually landed and/or reported in mixed categories such as "skates and rays" and "sharks". Landings of skates and rays should be declared at species level for all species. For assessment purposes species-specific landings data are essential.

In most countries skates and rays are landed together, most often sorted in particular size categories, rather than by species. They are usually gutted, and sometimes only wings are landed. Only some countries report (part of) the landings by species, i.e. France, Belgium, and Spain (Basque country).

There is currently no TAC for skates and rays in the Celtic Seas. The introduction of TACs can only regulate the landings, and any TAC on a bycatch species may induce more discards. Mesh-size regulations are probably not restrictive as there are few directed fisheries for these species. Certain elasmobranch species such as lesser spotted dogfish are primarily a bycatch species and are normally discarded. Discard survivorship of skates and rays is not known. Survivorship of coastal, demersal catsharks (*Scyliorhinus* spp.) is considered high.

Elasmobranchs are typically slow growing, have a high age-at-maturity and a low reproductive capacity. Measures to afford protection to the larger species are required. Historically, angel shark and white skate have been common locally in some inshore areas of the Celtic Seas ecoregion. Neither species has been recorded during recent groundfish surveys. Landings data for angel shark have declined to near-zero. The extirpation of these large-bodied, inshore elasmobranchs that have patchy distributions is a cause of concern, because there may be a low rate of population growth and low level of immigration from adjacent areas. Both species are likely to be equally threatened in more southerly European seas. This represents a potential loss in the fish diversity in the ICES area.

Impact of fisheries in the ecosystem

Skates and rays, and demersal sharks are widely spread throughout the Celtic Seas. They are mostly caught in mixed fisheries for gadoids and flatfish such as plaice and sole. Due to their life history characteristics they are usually very susceptible to fisheries. Larger elasmobranchs such as common skate, white skate, and angel shark are particularly vulnerable and have become locally depleted or extirpated.

Scientific basis

Data and methods

Survey data are the basis for the assessments of skates, rays, and demersal sharks in the Celtic Seas (see ICES, 2007, 2008).

Uncertainties in assessment and forecast

Survey data are the most reliable species-specific data available for demersal skates. However, many of the fishery-independent surveys in this ecoregion are not based on extensive time-series. These surveys are designed primarily for other types of fish and so the gears and sampling grids are not ideal for skate stocks, especially those species with patchy distributions.

Comparison with previous assessment and advice

ICES has never provided advice on these elasmobranchs in this area.

Source of information

ICES. 2007. Report of the Working Group on Elasmobranch Fishes (WGEF), 22–28 June 2007, Galway, Ireland. ICES CM 2007/ACFM:27, 318 pp.

ICES. 2008. Report of the Working Group on Elasmobranch Fishes (WGEF). 3–6 March 2008, ICES Headquarters. ICES CM 2008/ACOM:16.

Skates and rays

Year	ICES Advice	Single-stock exploitation boundaries	Predicted catch corresponding to advice	Predicted catch corresponding to single-stock exploitation boundaries	Agreed TAC [1]	ACOM landings	Disc. slip.	ICES Catch
1992	No advice				No TAC	16.6		
1993	No advice				No TAC	14.5		
1994	No advice				No TAC	13.9		
1995	No advice				No TAC	15.3		
1996	No advice				No TAC	19.0		
1997	No advice				No TAC	20.5		
1998	No advice				No TAC	20.0		
1999	No advice				No TAC	19.9		
2000	No advice				No TAC	19.9		
2001	No advice				No TAC	17.8		
2002	No advice				No TAC	18.8		
2003	No advice				No TAC	17.6		
2004	No advice				No TAC	13.2		
2005	No advice				No TAC	13.0		
2006	No advice				No TAC	10.0		
2007	No advice				No TAC	7.9 [2]		
2008	No advice				No TAC			
2009	Various [3]	NA		NA				

Weights in '000 t.
[1] EU only.
[2] Incomplete data. Landings are expected to be ~9000 tonnes.
[3] If landings of major species recorded by species. With zero catch of common skate, white skate and angel shark, and no targeted fishery for undulate ray.

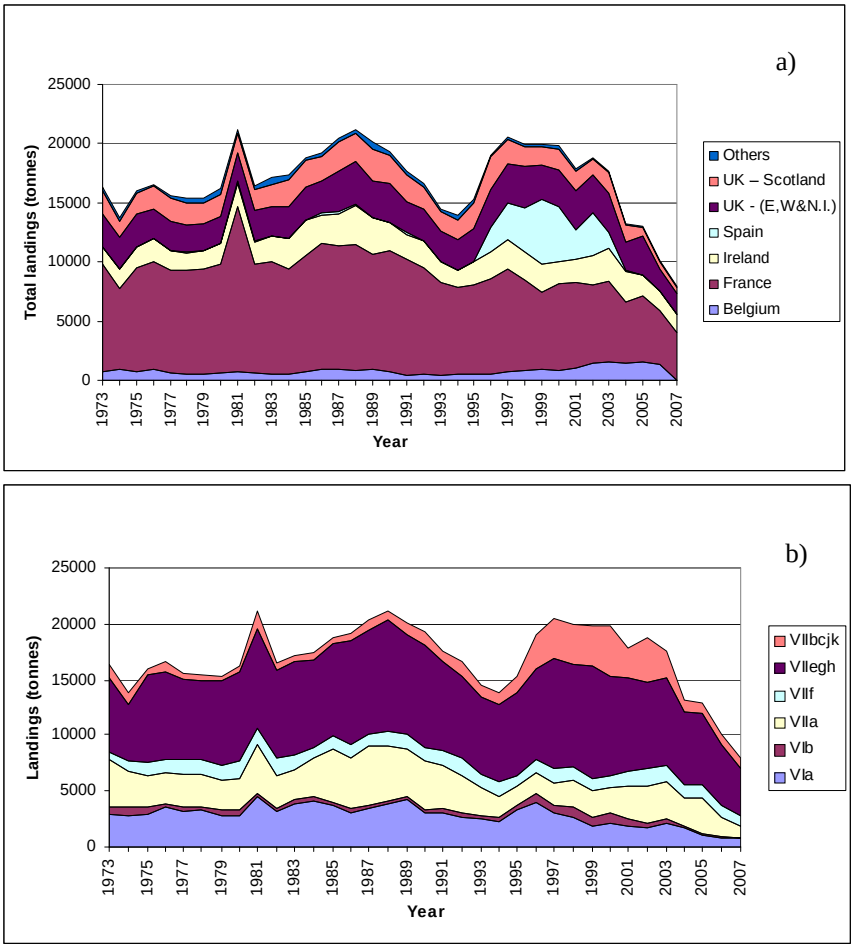


Figure 5.4.39.1 Rays and skates: landings in the Celtic Seas a) by country and b) by ICES area. All species combined, from ICES (2008). Data for 2007 are preliminary.

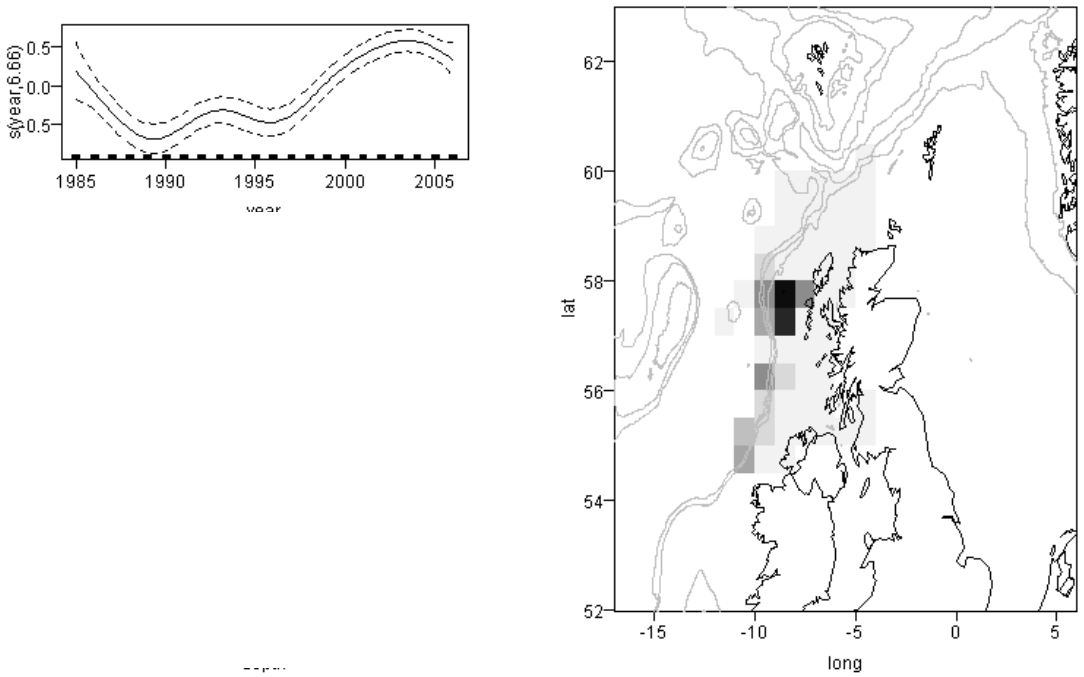


Figure 5.4.39.2 Thornback ray in Division VIa. Estimated year effects from the GAM analysis of Scottish survey catch rate data (log scale). Models are for N/hr.

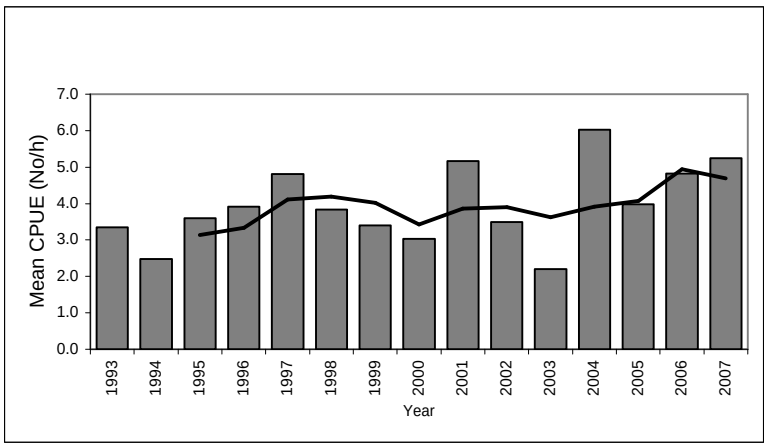


Figure 5.4.39.3 Thornback ray in the Irish Sea (VIIa) and Bristol Channel (VIIf). Mean catch rates of from the UK 4 m beam trawl survey (1993–2007). Smoothed line is the three-year moving average.

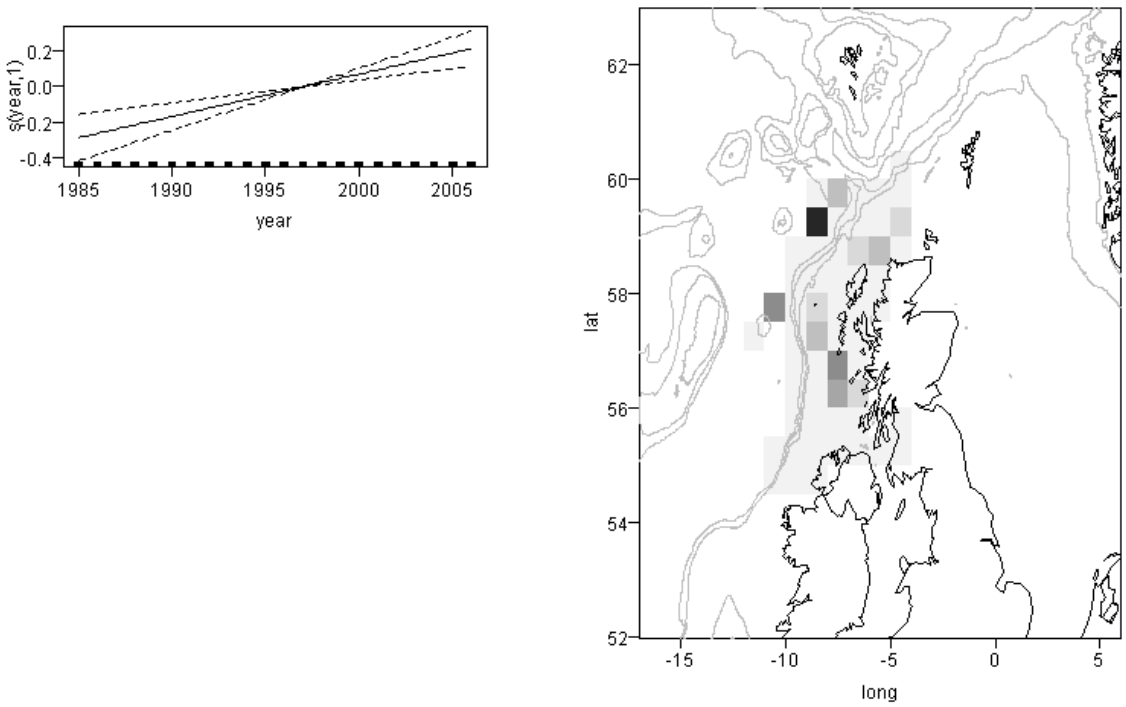
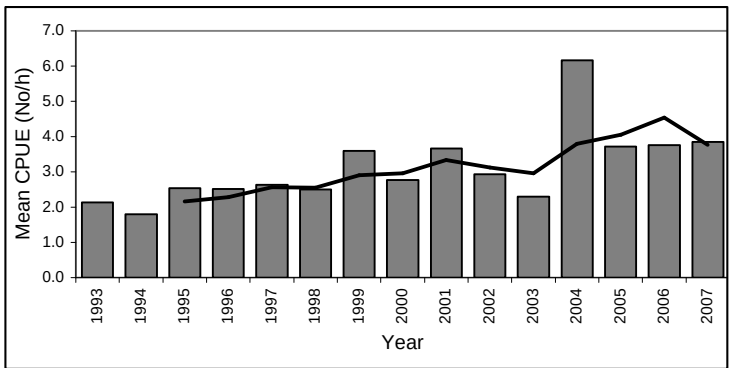


Figure 5.4.39.4 Spotted ray in Division VIa. Estimated year effects from the GAM analysis of Scottish survey catch rate data (log scale). Models are for N/hr.

Figure 5.4.39.5 Spotted ray in the Irish Sea (VIIa) and Bristol Channel (VIIf). Mean catch rates from the UK 4 m beam trawl survey (1993–2007). Smoothed line is the three-year moving average.



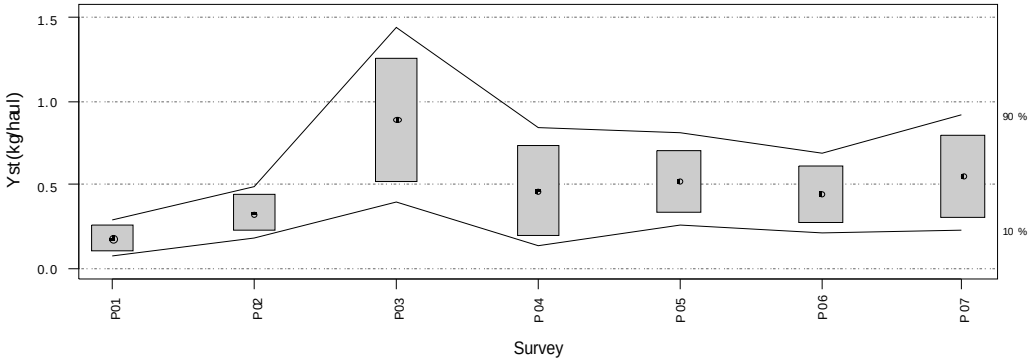


Figure 5.4.39.6 Cuckoo ray on the Porcupine Bank. Biomass index from the Porcupine Survey (2001–2007). Boxes indicate the parametric standard error of the stratified biomass index. Lines mark bootstrap confidence intervals (α = 0.80, bootstrap iterations = 1000).

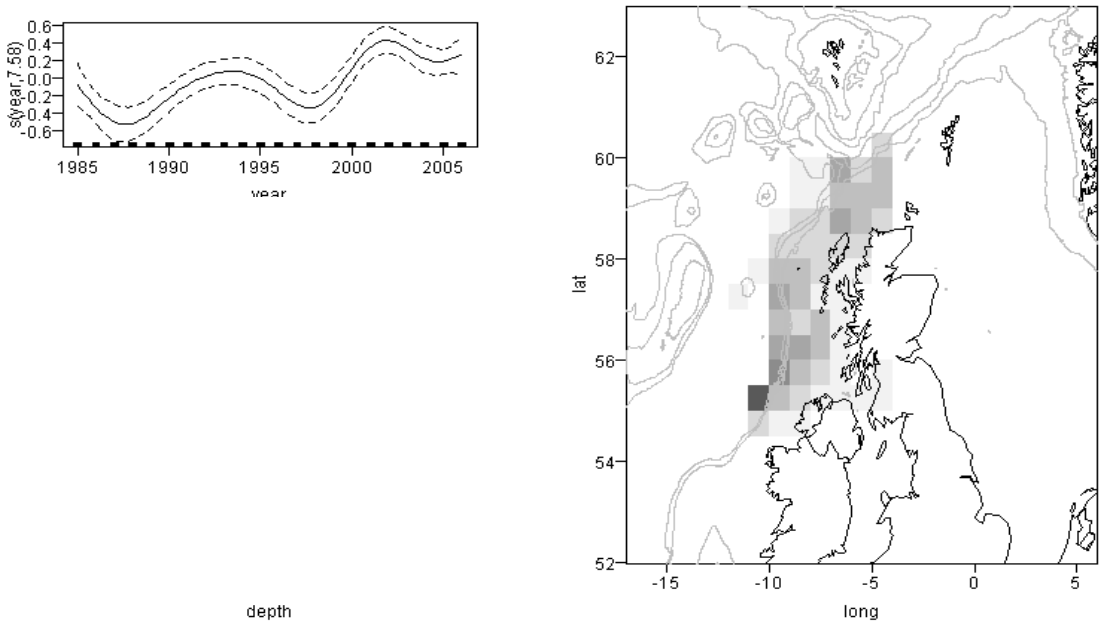


Figure 5.4.39.7 Cuckoo ray in Division VIa. Estimated year effects from the GAM analysis of Scottish survey catch rate data (log scale). Models are for N/hr.

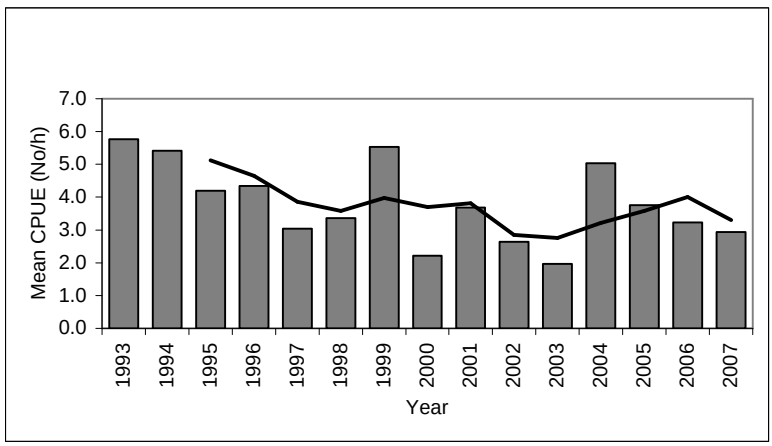


Figure 5.4.39.8 Cuckoo ray in the Irish Sea (VIIa) and Bristol Channel (VIIf). Mean catch rates in the UK 4 m beam trawl survey (1993–2007). Smoothed line is the three-year moving average. Data for cuckoo ray use trawl stations from the central Irish Sea/St George's Channel.

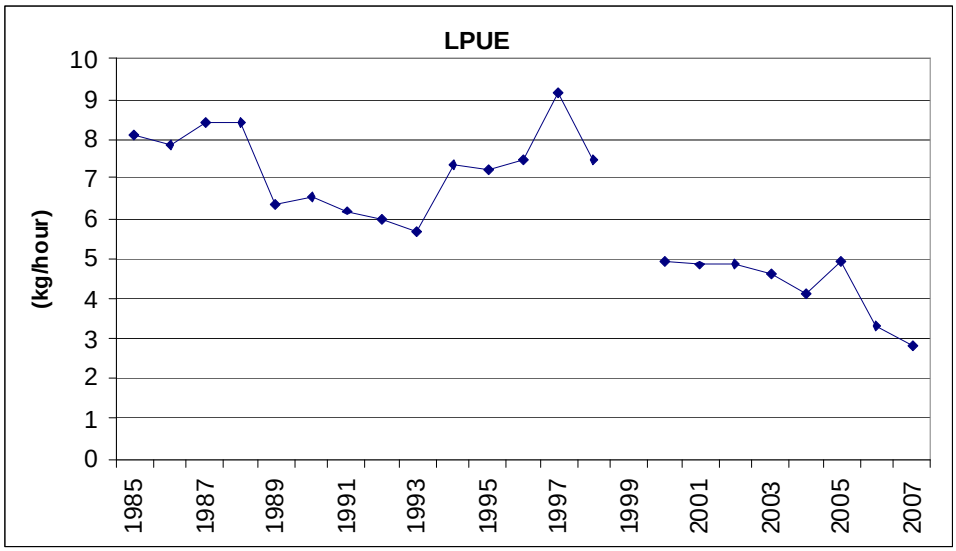


Figure 5.4.39.9 Cuckoo ray in the Celtic Sea (VIIgh). Lpue of French trawlers targeting benthic species (anglerfish, megrim, and rays). Data from 2000 onwards are from logbooks only.

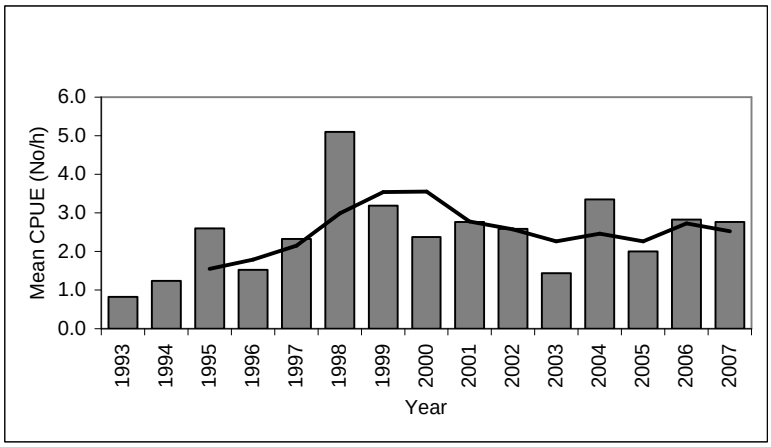


Figure 5.4.39.10 Smalleyed ray in the Irish Sea (VIIa) and Bristol Channel (VIIf). Mean catch rates in the UK 4 m beam trawl survey (1993–2007). Smoothed line is the three-year moving average. Data use trawl stations from the Bristol Channel only.

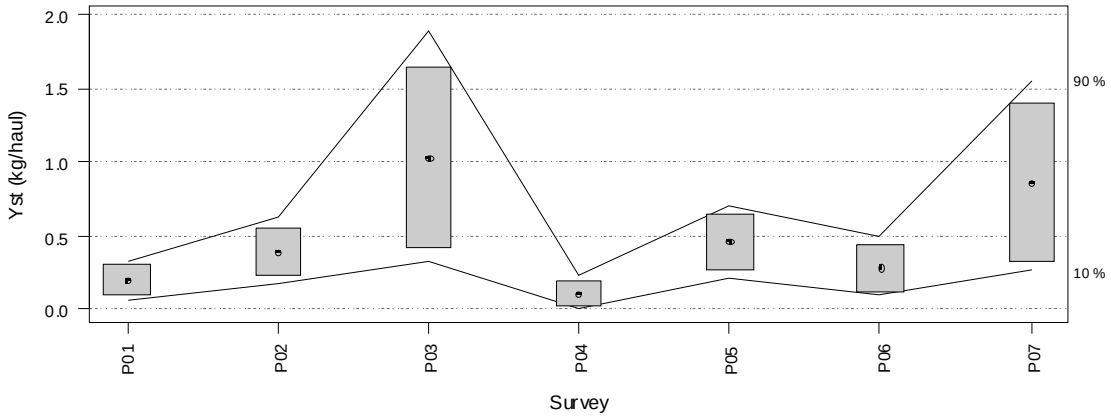


Figure 5.4.39.11 Sandy ray on the Porcupine Bank. Biomass index from the Porcupine Survey (2001–2007). Boxes indicate the parametric standard error of the stratified biomass index. Lines mark bootstrap confidence intervals (α = 0.80, bootstrap iterations = 1000).

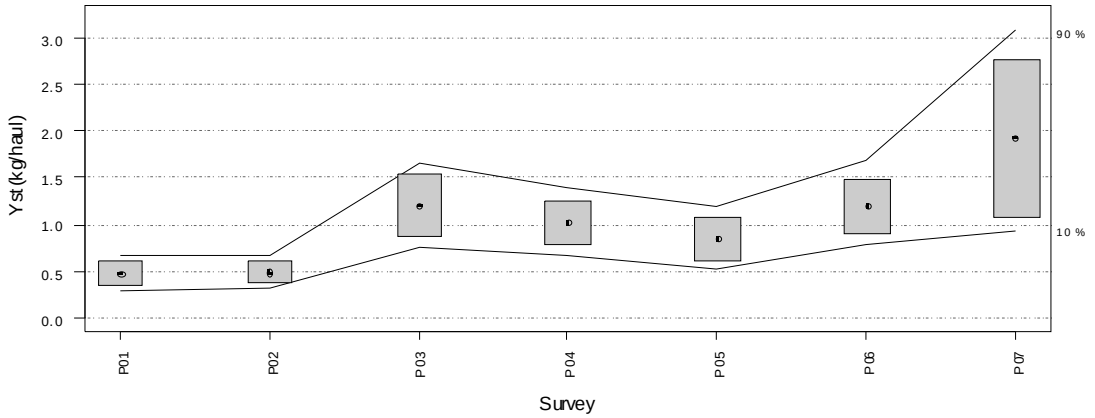


Figure 5.4.39.12 Lesser spotted dogfish on the Porcupine Bank. Biomass index from the Porcupine Survey (2001–2007). Boxes indicate the parametric standard error of the stratified biomass index. Lines mark bootstrap confidence intervals (α = 0.80, bootstrap iterations = 1000).

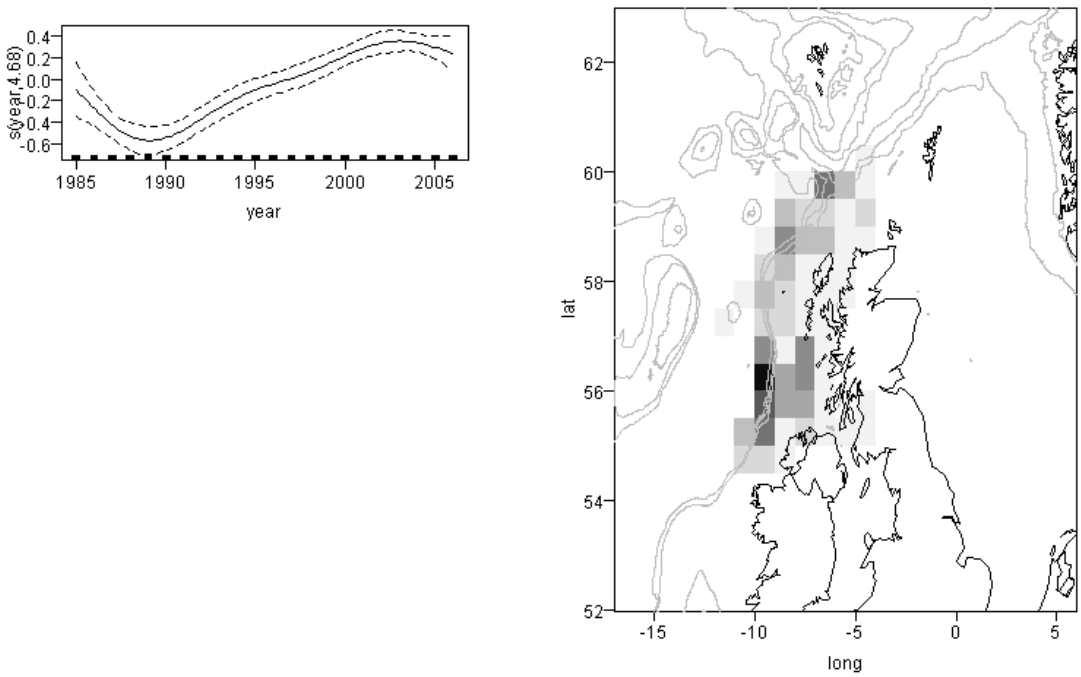


Figure 5.4.39.13 Lesser spotted dogfish in Division VIa. Estimated year effects from the GAM analysis of Scottish survey catch rate data (log scale). Models are forN/hr.

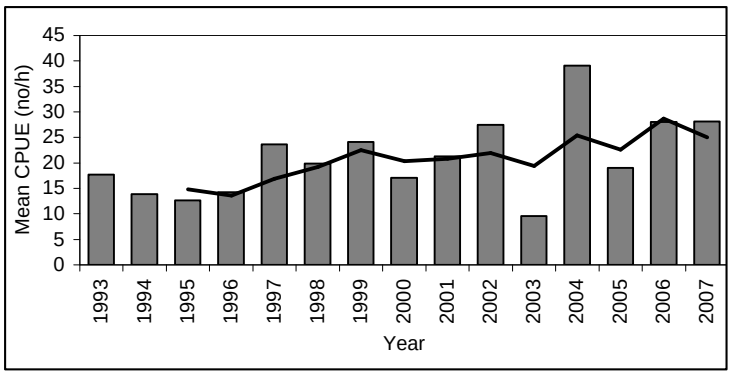


Figure 5.4.39.14 Lesser spotted dogfish in the Irish Sea (VIIa) and Bristol Channel (VIIf). Mean catch rates from the UK 4 m beam trawl survey in the Irish Sea and Bristol Channel (1993–2007). Smoothed line is the three-year moving average.

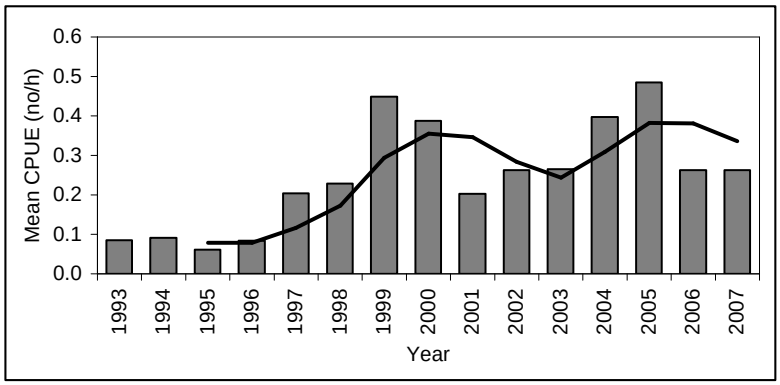


Figure 5.4.39.15 Greater spotted dogfish in the Irish Sea (VIIa) and Bristol Channel (VIIf). Mean catch rates from the UK 4 m beam trawl survey in the Irish Sea and Bristol Channel (1993–2007). Smoothed line is the three-year moving average.

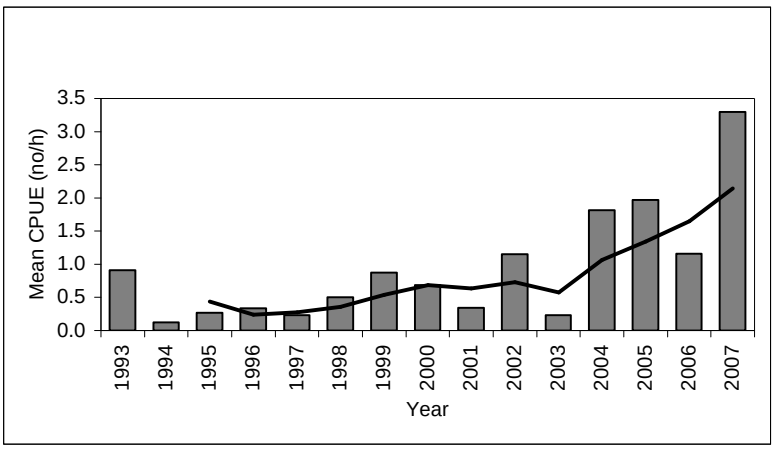


Figure 5.4.39.16 Smoothhounds in the Irish Sea (VIIa) and Bristol Channel (VIIf). Mean catch rates from the UK 4 m beam trawl survey in the Irish Sea and Bristol Channel (1993–2007). Smoothed line is the three-year moving average.