



Background Document for Thornback ray  
*Raja clavata*



## OSPAR Convention

The Convention for the Protection of the Marine Environment of the North-East Atlantic (the “OSPAR Convention”) was opened for signature at the Ministerial Meeting of the former Oslo and Paris Commissions in Paris on 22 September 1992. The Convention entered into force on 25 March 1998. It has been ratified by Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, Netherlands, Norway, Portugal, Sweden, Switzerland and the United Kingdom and approved by the European Community and Spain.

## Convention OSPAR

La Convention pour la protection du milieu marin de l'Atlantique du Nord-Est, dite Convention OSPAR, a été ouverte à la signature à la réunion ministérielle des anciennes Commissions d'Oslo et de Paris, à Paris le 22 septembre 1992. La Convention est entrée en vigueur le 25 mars 1998. La Convention a été ratifiée par l'Allemagne, la Belgique, le Danemark, la Finlande, la France, l'Irlande, l'Islande, le Luxembourg, la Norvège, les Pays-Bas, le Portugal, le Royaume-Uni de Grande Bretagne et d'Irlande du Nord, la Suède et la Suisse et approuvée par la Communauté européenne et l'Espagne.

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### Photo acknowledgement

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# Background Document for Thornback ray *Raja clavata*

## Executive Summary

This Background Document for Thornback ray *Raja clavata* has been developed by OSPAR following the inclusion of this species on the OSPAR List of threatened and/or declining species and habitats (OSPAR Agreement 2008-6). The document provides a compilation of the reviews and assessments that have been prepared concerning this species since the agreement to include it in the OSPAR List in 2008. The original evaluation used to justify the inclusion of *R. clavata* in the OSPAR List is followed by an assessment of the most recent information on its status (distribution, population, condition) and key threats prepared during 2009-2010. Chapter 7 provides proposals for the actions and measures that could be taken to improve the conservation status of the species. In agreeing to the publication of this document, Contracting Parties have indicated the need to further review these proposals. Publication of this background document does not, therefore, imply any formal endorsement of these proposals by the OSPAR Commission. On the basis of the further review of these proposals, OSPAR will continue its work to ensure the protection of *R. clavata*, where necessary in cooperation with other competent organisations. This background document may be updated to reflect further developments or further information on the status of the species which becomes available.

## Récapitulatif

Le présent document de fond sur la Raie bouclée a été élaboré par OSPAR à la suite de l'inclusion de cette espèce dans la liste OSPAR des espèces et habitats menacés et/ou en déclin (Accord OSPAR 2008-6). Ce document comporte une compilation des revues et des évaluations concernant cette espèce qui ont été préparées depuis qu'il a été convenu de l'inclure dans la Liste OSPAR en 2003. L'évaluation d'origine permettant de justifier l'inclusion de la Raie bouclée dans la Liste OSPAR est suivie d'une évaluation des informations les plus récentes sur son statut (distribution, population, condition) et des menaces clés, préparée en 2009-2010. Le chapitre 7 fournit des propositions d'actions et de mesures qui pourraient être prises afin d'améliorer l'état de conservation de l'espèce. En se mettant d'accord sur la publication de ce document, les Parties contractantes ont indiqué la nécessité de réviser de nouveau ces propositions. La publication de ce document ne signifie pas, par conséquent que la Commission OSPAR entérine ces propositions de manière formelle. A partir de la nouvelle révision de ces propositions, OSPAR poursuivra ses travaux afin de s'assurer de la protection de la raie bouclée, le cas échéant avec la coopération d'autres organisations compétentes. Ce document de fond pourra être actualisé pour tenir compte de nouvelles avancées ou de nouvelles informations qui deviendront disponibles sur l'état de l'espèce.

## 1. Background information

### Name of species

Thornback ray (*Raja clavata*) Linnaeus, 1758

## 2. Original evaluation against the Texel-Faial selection criteria

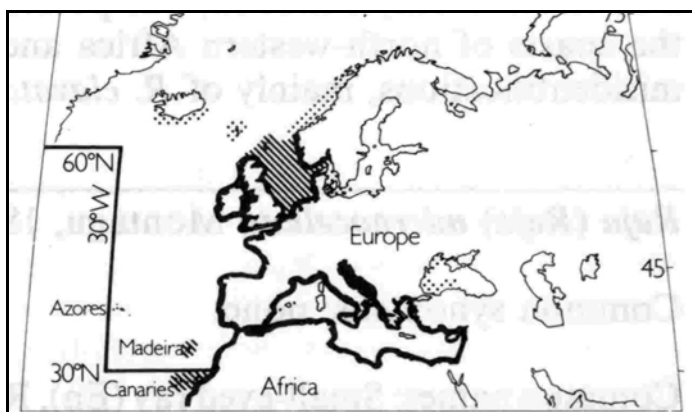
### List of OSPAR Regions and Dinter biogeographic zones where the species occurs

OSPAR Regions: I, II, III, IV, V

Biogeographic Zones: South Iceland-Faeroe Shelf, West Norwegian subprovince, Skagerrak subprovince, Boreal, Boreal-Lusitanian, Lusitanian-Boreal, Warm Lusitanian subprovince, Cool Lusitanian subprovince, Azores subprovince (Macaronesian province)

Figure 1: Distribution of Thornback ray (*Raja clavata*)

Source: Stehmann & Bürkel in Whitehead *et al.* 1984



### List of OSPAR Regions where the species is under threat and/or in decline

OSPAR Region: II

### Original evaluation against the Texel-Faial criteria for which the species was included on the OSPAR List

*R. clavata* was nominated for inclusion in the OSPAR List in 2006 by Germany.

**Table 1:** Summary assessment of Thornback ray (*Raja clavata*) against Texel-Faial criteria

Criterion	Comments	Evaluation
Global importance	Widely distributed outside the OSPAR Area in the East Atlantic and Mediterranean.	Does not qualify
Regional importance	<i>R. clavata</i> is comprised of several distinct genetic stocks. There are some important centres of distribution and areas of essential habitat within the OSPAR Area, including the Wash, Thames Estuary and Southeast English Channel	Does not qualify
Rarity	Not rare	Does not qualify



Sensitivity	Sensitive to very sensitive to depletion when fishing pressure is high because of its slow growth rates, relatively large size and tendency to form aggregations. Will be slow to recover from depletion.	Qualifies
Keystone species	No information	Unknown
Decline	Patterns of decline in <i>R. clavata</i> vary across the OSPAR Maritime Area, where this is one of the most important species of skate and ray in commercial fisheries. Trends are difficult to determine in most areas, due to poor species identification and the amalgamation of all skates and rays in landings data. Declines are most marked in OSPAR Region II, where ICES considers <i>R. clavata</i> to be depleted following a long term reduction in abundance over the past century. Local abundance is still high in some areas, but the area occupied has recently contracted to only 44% of its extent in the 1980s.	Qualifies

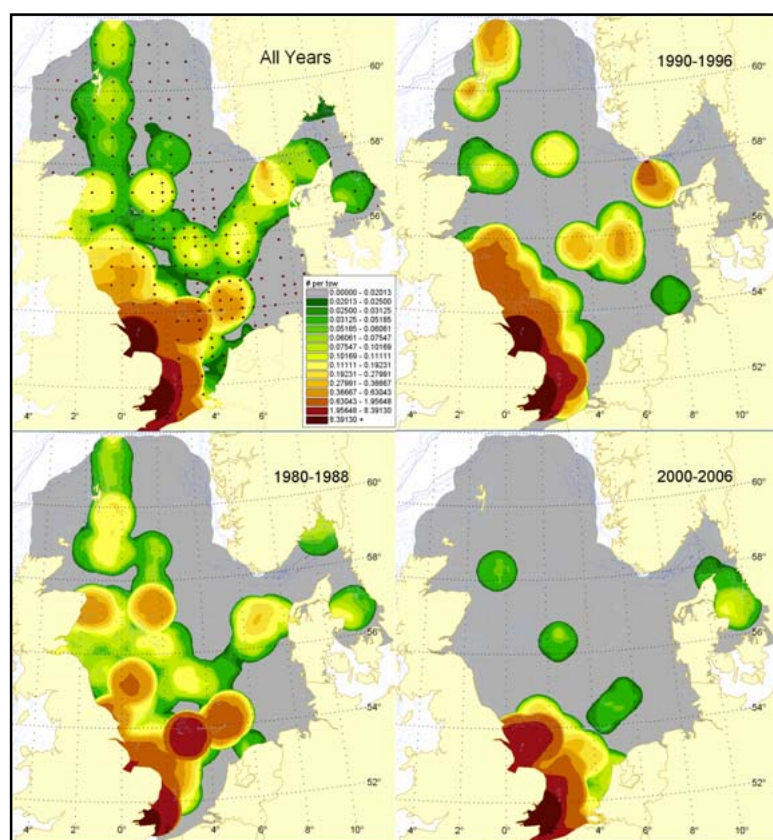


Figure 2: Distribution of Thornback ray (*Raja clavata*) in the North Sea 1980–2006  
Source: ICES WGEF 2007

### 3. Current status of the species

#### Distribution in the OSPAR Maritime Area

*Raja clavata* inhabits mud, sand, shingle, gravel and rocky areas on the shelf and upper slope in the North-East Atlantic (OSPAR Regions I, II, III and IV). *R. clavata* also occurs in Region V/ICES Subarea X (including the Azores); however, as of today no assessments have been conducted for this Region due to insufficient data (ICES WGEF 2009). It is most abundant in coastal areas at 10–60 m

depth (shallower in cold temperate waters, deeper in warmer waters), commonly recorded to 100 m, and occasionally to at least 300 m. Outer estuaries and large shallow bays (particularly the Wash and the Thames Estuary) are important spring/summer spawning grounds, nurseries and feeding areas. It also occurs in the Mediterranean, enters the Baltic and Black Seas, and extends south to Namibia, including Madeira. (Wheeler 1969; Stehmann & Buerkel 1984; Ellis *et al.* 2005a; Hunter *et al.* 2006; Fricke *et al.* 2007; Wirtz *et al.* 2008.) Its area of distribution within OSPAR Region II has decreased over the past century, with the stock becoming concentrated in the south western North Sea, where (following the extirpation of larger species, such as the Common skate) it is now the main commercial skate species (ICES 2008).

### Population (current/trends/future prospects)

There is no population estimate for *R. clavata* in the OSPAR Area or in Region II, but abundance and range has been declining in the North Sea (Region II) during the past 20 years. At the beginning of the 20<sup>th</sup> Century, it was widely distributed over the southern North Sea, with centres of abundance in the south-western North Sea and in the German Bight, north of Helgoland. Its area of occupancy is now only 44 % of that in the 1980s and it is now concentrated in the southwest and adjacent Channel (Figures 2 & 3, ICES WGEF 2007). It is no longer present in the south eastern North Sea (German Bight). ICES (2008) advised that the stock in the south-western North Sea and adjacent Channel is now stable or increasing, but that its status is uncertain elsewhere in OSPAR Region II.

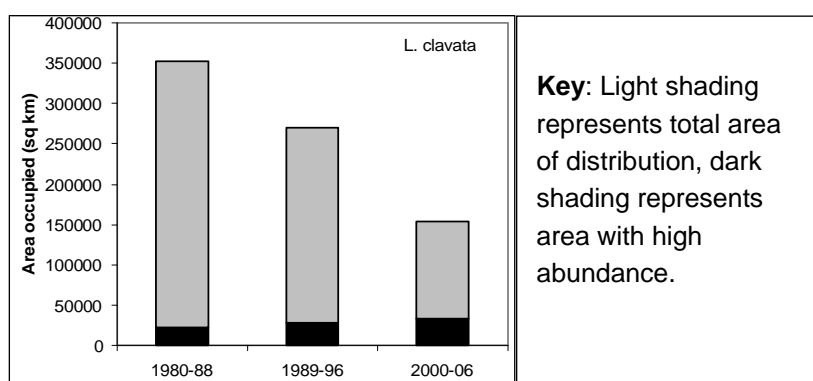
ICES WGEF (2008) reports that the status of *R. clavata* in inshore waters of the Celtic Seas (OSPAR Region III) is uncertain, but catch rates appear to be stable or increasing. This is one of the most important commercial species in this area and is thought to have been more abundant in the past. In OSPAR Region IV, *R. clavata* used to be the dominant species in French commercial ray fisheries, but has been replaced by Cuckoo ray, while landings of both species have declined, although *R. clavata* biomass appears to be stable or increasing. In the northern part of OSPAR Region IV, abundance of skates (primarily Thornback and Cuckoo ray) has decreased since a peak in 1998, but biomass further south has increased (ICES advice 2008, in European Commission 2009).

Distribution in the Mediterranean and Black Seas may also be contracting (IUCN SSG in prep.).

Figure 3

Area of North Sea (km<sup>2</sup>) occupied by *Raja clavata* during the three periods 1980–2006 illustrated in Figure 2.

Source: ICES WGEF 2007



### Condition (current/trends/future prospects)

ICES (2007) considers the North Sea (OSPAR Region II) stock of *R. clavata* to be depleted as a result of unsustainable removal in fisheries. Recovery will require fishing pressure on this stock to be

reduced. The status of stocks in other OSPAR Regions areas is uncertain, but appears to be stable or increasing. In 2008, ICES advised that the stock in ICES subareas Ivc (south-western North Sea) and VIId (eastern Channel) is stable or increasing, but that it is uncertain elsewhere in OSPAR Region II.

### Limitations in knowledge

Species identification is inadequate in many areas and this species is variable in appearance, requiring improved identification guides for regional fisheries. Very few countries record skates and rays by species, with France and Portugal being the only States reporting *R. clavata* according to the 2007 Eurostat/ICES database on catch statistics (European Commission 2009). EU Member States have been required since 2008 to provide species-specific landings data for *R. clavata* and other major species of skates and rays in the North Sea. This requirement was extended in 2009 to the EC waters of IIIa, Via-b, VII, VIII and IX (OSPAR Regions III and IV). This will ultimately improve understanding of skate fisheries in the OSPAR Area (ICES WGEF 2008).

## 4. Evaluation of threats and impacts

This species is prone to localised depletion by fisheries because it tends to form aggregations (ICES 2008). It has been identified by ICES WGEF (2008, 2009) and the European Commission (2009) as one of the demersal elasmobranchs subjected to particular fishing pressure and probably the most common and important ray taken in longline, static net (gill or tangle) and trawl fisheries in OSPAR Region II. This is also one of the most abundant rays in the Celtic Seas (OSPAR Region III) where it is taken as by-catch, as well as being targeted seasonally in the Irish Sea and Bristol Channel with only the smallest individuals discarded. It is also an important commercial species in OSPAR Region IV, where it comprised 17 % of skate catch composition in 2000–2006, and in Region V, off the Azores. It is also taken by sports anglers, particularly off the UK and Irish coasts.

Since the reduction in the North Sea TAC for skates and rays and the introduction of a by-catch limit of no more than 25 % of catch retained on board for vessels over 15 m, the threat posed by target fisheries in OSPAR Region II has fallen. By-catch mortality in inshore fisheries is probably now the most significant threat to this species here. An initial Fisheries Science Partnership study on the survival of *R. clavata* discarded from a commercial trawl fishery showed that two out of three discarded rays survived for at least three days and up to 45 days (based on initial tag returns), but that survival rates decrease with length of tow and total catch/codend weight (Catchpole *et al.* 2007).

Decreasing fishing effort as a result of improved management and economic constraints is likely to reduce still further the threat posed by fisheries in future years. However, ICES WGEF (2009) warned that a consequence of fishing effort restrictions and high fuel prices may be diversion of fishing effort to small inshore fisheries that may target skates.

**Table 2:** Summary of key threats and impacts to Thornback ray (*Raja clavata*)

Type of impact	Cause of threat	Comment
Fisheries	Target and utilised by-catch fisheries.	See above.
Habitat damage	Mobile fishing gears, pollution	Minor impact compared with mortality in fisheries.

## 5. Existing management measures

A total allowable catch (TAC) has been set for skates and rays in the North Sea since 1999, although this is a single TAC for all species, which has not protected the most vulnerable large bodied skates



and rays, and until recently was too high to restrict catches. The TAC has been reduced by a total of approximately 50 % since 2005 (15 % from 2005 to 2006, 20 % from 2006 to 2007, and 25 % since 2007). It is now considerably lower than average recent landings (ICES WGEF 2008). The analytical TAC for 2008 and 2009 was set at 1643 t and includes a 25 % by-catch quota for vessels exceeding 15 m in length, to prevent targeting of aggregations by large vessels. European Commission (2009) notes, however, that demersal elasmobranchs may be subject to area misreporting in order to permit the landings of rays in excess of this 25 % limit, and that skates and rays taken early in a fishing trip may have to be discarded dead if sufficiently large quantities of other commercial species are not caught to make up the required 75 % balance of catch. Skate and ray fisheries in other parts of the OSPAR area have now also come under TAC management, although not limited to by-catch.

Because the 2008 TAC was considerably less than the landings, ICES WGEF (2008) warned that, if fishers do not change their practices, this must either lead to an increase of discarding and/or to misreporting. The WGEF therefore stated “the current TAC should not be reduced any further at this time.” ICES (2008) advised: “Fishing mortality should not increase and the fishery should be closely monitored. Measures to deter fisheries that target spawning concentrations of *R. clavata* in Division Ivc [OSPAR Region II] should be closely monitored because this is the most vital part of the *R. clavata* spawning in the south-western North Sea.

From 2008 onwards the EC has obliged Member States to provide species specific landings data for the major North Sea species of skates and rays, including *R. clavata*, extended to other areas in 2009 (see 3.4). At least five years of such data are required before management advice can be improved.

Minimum landing sizes have been set for skates and rays in a few Sea Fisheries Committee Districts in English and Welsh waters, but not in OSPAR Region II. These protect juvenile rays and adults of the smallest, most fecund and abundant species, but do not provide effective protection for adult female *R. clavata*, which mature at a larger size than the legal minimum and (as noted above) are targeted on spawning grounds. A maximum landing size may be a more effective management tool for large-bodied species.

## 6. Conclusion on overall status

This species has been depleted by fisheries in most of Region II, where its area of distribution has contracted significantly. It remains abundant and its population stable in one critical area in the southwest North Sea and eastern Channel, where its aggregating habit and the concentration of spawning females makes it vulnerable to target fisheries and by-catch, particularly in the Wash and Outer Thames Estuary. Restrictive management has been introduced in recent years, including measures to reduce fisheries mortality. There have been lesser declines in other localised parts of the OSPAR Area. *R. clavata* is assessed on the IUCN Red List of Threatened Species as “Near Threatened” globally.

## 7. Action to be taken by OSPAR

The conservation objectives for this species in Region II stock should be to protect critical areas (nursery grounds and south-western locations where the species aggregates); to reduce overall demersal fishing effort in order to restrict fishing mortality more widely across the Region and allow population recovery; and to improve data collection to enable more detailed management advice to be developed.

### Action/measures that OSPAR could take, subject to OSPAR agreement

As set out in Article 4 of Annex V of the Convention, OSPAR has agreed that no programme or measure concerning a question relating to the management of fisheries shall be adopted under this

Annex. However where the Commission considers that action is desirable in relation to such a question, it shall draw that question to the attention of the authority or international body competent for that question. Where action within the competence of the Commission is desirable to complement or support action by those authorities or bodies, the Commission shall endeavour to cooperate with them.

Scientific advice on the management of this species is available from ICES and is likely to be supplemented by activities proposed under the Community Shark Plan of Action to improve data collection and scientific advice, management and technical measures. OSPAR should endeavour to support the adoption of this advice by its Contracting Parties.

It is proposed that OSPAR should encourage relevant Contracting Parties (Range States and those whose flag vessels are engaged in fisheries that capture skates and rays) to adopt or support the adoption of ICES advice for this species through:

1. national, European and regional fisheries conservation and management measures, including provisions within the Community Plan of Action on Sharks and the introduction of maximum landing sizes;
2. the designation of marine protected areas for aggregations and spawning grounds; and
3. marine species and fisheries research.

It is proposed that OSPAR should draw to the attention of Contracting Parties the requirement for catches of skates and rays to be reported at the species level and to make this information available to ICES, and to encourage the development of regional species identification guides for the industry.

**Table 3:** Summary of key priority actions and measures which could be taken for Thornback ray (*R.clavata*). Where relevant, the OSPAR Commission should draw the need for action in relation to questions of fisheries management to the attention of the competent authorities. Where action within the competence of the Commission is desirable to complement or support action by those authorities or bodies, the Commission shall endeavour to cooperate with them.

Key threats	Fisheries mortality (target and by-catch) in unsustainable fisheries, particularly those targeting aggregations		
Other responsible authorities	EC and Council of Fisheries Ministers (Common Fisheries Policy, Regulations, TACs)  OSPAR Contracting Parties  ICES		
Already protected?  Measures adequate?	EU: TAC, effort regulation	TACs are restrictive in some areas, but until recently have been higher than scientific advice  Demersal fishing effort is regulated	
	EU: catch records	Most States do not yet provide species-specific data for skates and rays.	

Recommended Actions and Measures	OSPAR Commission	Monitor information and advice of the ICES Working Group on Elasmobranch Fisheries and bring this to the attention of CPs.
	Contracting Parties	Make identification guides available to industry and agencies to ensure that accurate species-specific catch records are collected;  Support ICES and Commission recommendations in the Council of Ministers.
	Research needs	Life history and trend data, discard survival studies, modelling impact of maximum landing sizes upon stock recovery

#### **Brief summary of the proposed monitoring system (see Annex 2)**

Fishery-independent surveys are monitoring this species. Greater observer coverage would significantly improve monitoring and collection of scientific data. The mandatory requirement for species-specific landings data from EU MS is not being fully met and is essential for monitoring the status of fisheries for and stocks of this species and other skates and rays.

## Annex 1: Overview of data and information provided by Contracting Parties

Contracting Party	Feature occurs in CP's Maritime Area	Contribution made to the assessment (e.g. data or information provided)	National reports References or web links
Belgium	Y	N	
Denmark	Y	Y – Review of Draft	
France	Y	Y – Review of Draft	
Germany	Y	Y – Preparation of Draft	Fricke, R., M. Bilecenoglu & H. M. Sari (2007) Annotated checklist of fish and lamprey species (Gnathostomata and Petromyzontomorphi) of Turkey, including a Red List of threatened and declining species. <i>Stuttgarter Beiträge zur Naturkunde</i> , (A) 706: 1-169, figs 1-3, tabs 1-8.  Wirtz, P., R. Fricke & M. J. Biscoito (2008) The coastal fishes of Madeira Island – new records and an annotated checklist. <i>Zootaxa</i> , 1715: 1-26, figs 1-8.
Iceland	Y	N	
Ireland	Y	N	
Netherlands	Y	N	
Norway	Y	N	
Portugal	Y	N	
Spain	Y	Y – Review of Draft	See information provided below
Sweden	Y	Y – Review of Draft	See information provided below
United Kingdom	Y	Y – Review of Draft	

### Summaries of country-specific information provided

#### **Spain:** *Raja clavata* (thornback ray) in the Cantabrian Sea

*Distribution:* Thornback ray (*Raja clavata*, Linnaeus, 1758) is a quite common ray found in the continental shelf of the Cantabrian Sea. It is found over sandy, muddy or gravelly bottoms on the shelf and upper slope mainly at 50- 250 m (Figure illustrating distribution 1999–2008 provided). *A priori* the area occupied by this species in these waters has not been reduced in recent years.

**Abundance:** Annual bottom trawl surveys are carried out by the Spanish Institute of Oceanography (IEO) along the continental shelf of the Cantabrian Sea (north of Spain) during autumn. These surveys are based on a stratified random sampling design, using an otter trawl 44/60 gear with a mesh size of 60 mm, and 20 mm in the cod-end (Sánchez, 1993; ICES, 1999). The survey area is stratified according to depth (70-500 m) and biogeographical criteria (Sánchez *et al.*, 2002). The abundance index is obtained as the stratified mean catch (weight and number) per 30 min standard tow.

The historical series of abundance index showed inter-annual fluctuations. The highest levels either in biomass or number were achieved in 2000 and 2001 while the lowest indices corresponded to the first period of the historical series, 1989 and 1991. An increasing trend is observed in the recent years (Figure provided). Although we do not know which factors may contribute to this increasing trend, the latest closed areas installed in the Cantabrian Sea (artificial reefs) to avoid trawling may have contributed to enhance the population (Rodríguez-Cabello *et al.*, 2008).

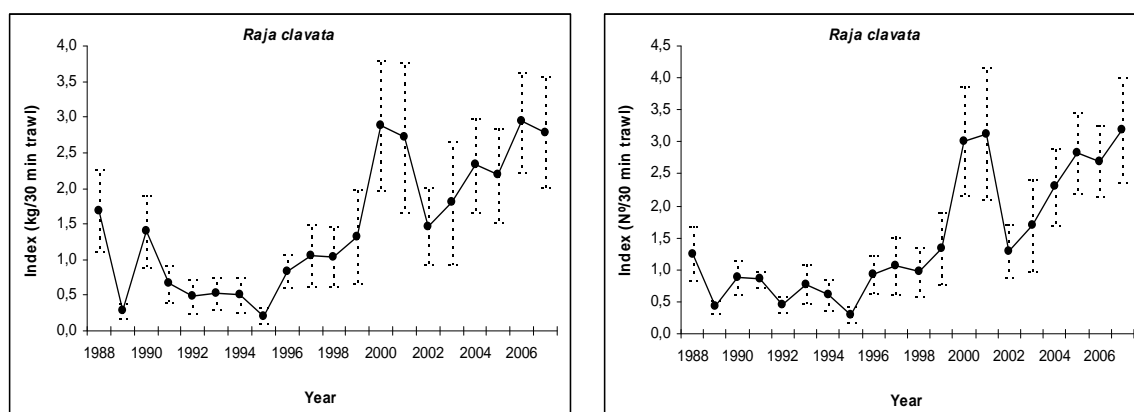


Figure 4: Historical series of abundance index (1988-2007) mean and standard error (dotted lines), expressed in kilograms by 30 minutes trawl and number of rays by 30 minutes trawl.

**Fishery:** The Spanish demersal fishery along the Cantabrian Sea and Bay of Biscay takes many species of rays with a wide variety of gears, but most of the landings come from the by-catch of fisheries targeting other demersal species such as hake, anglerfish and megrim.

The most commercial species of rays are cuckoo ray *Leucoraja naevus* and *Raja clavata*, however due to a lack of species-specific landings data, limited knowledge of the species composition of skates in commercial landings is available (Rodríguez-Cabello *et al.*, 2005; Bañón *et al.*, 2008b). Landings of rays from 1996 to 2006 by ICES division and country are compiled in the last WGEF 2008 (ICES, 2008).

**Sweden:** Swedish fishing ban since 2004. A study by a local fishing club is under way to tag 50 individuals along the Swedish west coast to study the population size and migration. The species is listed as VU on the Swedish red list (IUCN) (2005).



## Annex 2: Detailed description of the proposed monitoring and assessment strategy

### Rationale for the proposed monitoring

Monitoring is essential to provide management advice and to evaluate future trends, including by-catch and stock recovery following cessation of target fisheries.

### Use of existing monitoring programmes

Regular fishery independent surveys are undertaken by research vessels and chartered vessels in the OSPAR Area. This species should now also be reported accurately in landings by EU Member States. The ICES Working Group on Elasmobranch Fishes uses these and all other available sources to report regularly on the status of this species in the OSPAR Area.

### Synergies with monitoring of other species or habitats

Monitoring of other demersal fish species on the OSPAR list require the same strategy.

### Assessment criteria

It is not considered necessary to develop assessment criteria or triggers for additional monitoring of this species at the present time.

### Techniques/approaches

As already underway, with the addition of more accurate identification guides for use by industry and at landing sites.

### Selection of monitoring locations

n/a

### Timing and Frequency of monitoring

As already underway.

### Data collection and reporting

As already undertaken with improvements as required (e.g. species-specific catch and landings data).

### Quality assurance

n/a

## Annex 3: References

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New Court  
48 Carey Street  
London WC2A 2JQ  
United Kingdom

t: +44 (0)20 7430 5200  
f: +44 (0)20 7430 5225  
e: [secretariat@ospar.org](mailto:secretariat@ospar.org)  
[www.ospar.org](http://www.ospar.org)

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