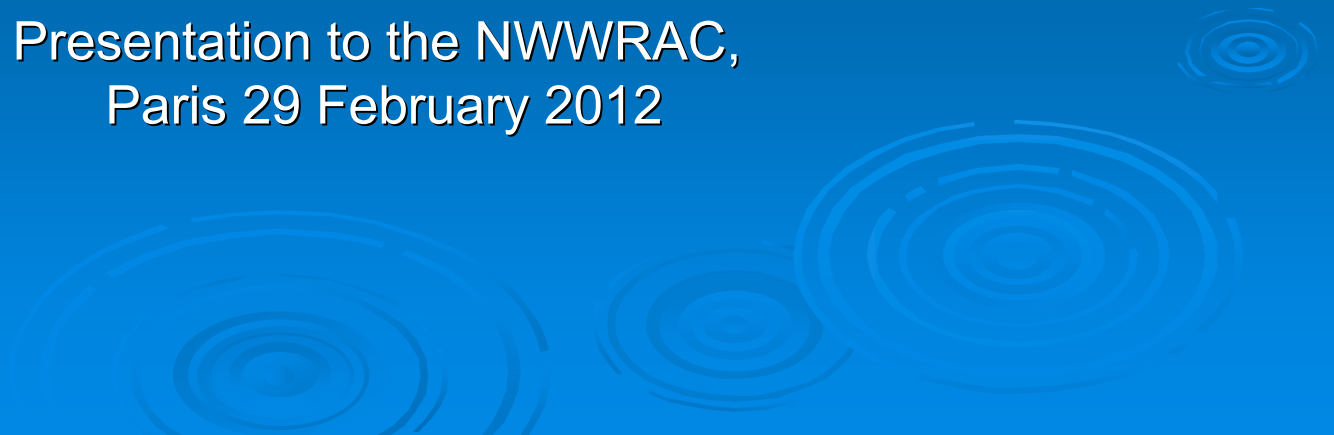


Status of skates and rays in ICES divisions VI and VII

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Presentation to the NWWRAC,
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Outline

➤ Distribution

➤ Biology

➤ Status



Ray and Skate Species found in the Celtic Seas

Scientific name	VIa	VIb	VIIa	VIIb	VIIc	VIIId	VIIe	VIIIf	VIIg	VIIh	VIIj	VIIk
<i>"Dipturus batis"</i>	●	●	●	●	●	⊙	●	●	●	●	●	●
<i>D. nidarosiensis</i>	●	●	○	●	●	○	○	○	○	○	●	●
<i>D. oxyrinchus</i>	●	●	○	●	●	○	○	○	⊙	●	●	●
<i>Leucoraja circularis</i>	●	●	○	●	●	○	○	○	⊙	●	●	●
<i>L. fullonica</i>	●	●	⊙	●	●	○	⊙	⊙	●	●	●	●
<i>L. naevus</i>	●	●	●	●	●	⊙	●	●	●	●	●	●
<i>Raja brachyura</i>	●	⊙	●	●	⊙	●	●	●	●	●	●	○
<i>R. clavata</i>	●	●	●	●	●	●	●	●	●	●	●	⊙
<i>R. microocellata</i>	⊙	○	⊙	●	○	●	●	●	●	⊙	●	○
<i>R. montagui</i>	●	●	●	●	⊙	●	●	●	●	●	●	⊙
<i>R. undulata</i>	○	○	⊙	●	○	●	●	⊙	⊙	⊙	●	○
<i>Rostroraja alba</i>	○	○	⊗	●	?	⊗	⊗	?	?	?	?	○

● Present

○ Absent

⊙ Occasional vagrants, or
distribution may extend
into region

⊗ Occurred in past

ICES Advice

- ICES advice for elasmobranchs is on a two year cycle
- Last issued in 2010
- Next release is October 2012
- Recommend TACs that should last for two years

ICES advice for skates and rays

- Provided on an ecoregion basis for most species e.g. demersal elasmobranchs in the Celtic Seas
- Advice for 2011 and 2012 for Celtic Seas:
 - Landings of less than 9,900 tonnes.
 - No target fishery on *Raja undulata* and *Dipturus batis* complex

Scientific	English	French	Spanish	Advice
<i>Dipturus batis</i>	Common skate	Pocheteau gris	Raya noriega	No targeted fishery
<i>Dipturus nidarosiensis</i>	Norwegian skate	Pocheteau de Norvège	Raya noruega	No advice
<i>Dipturus oxyrinchus</i>	Long-nosed skate	Pocheteau noir	Raya picón, Raya picuda	No advice
<i>Leucoraja circularis</i>	Sandy ray	Raie circulaire	Raya falsa vela	No advice
<i>Leucoraja fullonica</i>	Shagreen ray	Raie chardon	Raya cardadora	No advice
<i>Leucoraja naevus</i>	Cuckoo ray	Raie fleurie	Raya santiaguesa	Reduce from recent catch levels
<i>Raja brachyura</i>	Blonde ray	Raie lisee	Raya boca de rosa	No advice
<i>Raja clavata</i>	Thornback ray	Raie bouclée	Raya de clavos	Status quo catches
<i>Raja microocellata</i>	Small-eyed ray Painted ray	Raie mēlée	Raya colorada	Status quo catches
<i>Raja montagui</i>	Spotted ray	Raie douce	Raya pintada	Status quo catches
<i>Raja undulata</i>	Undulate ray	Raie brunette, Raie peinte	Raya mosaica	Status quo catches
<i>Rostraraja alba</i>	White skate	Raie blanche	Raya blanca	Retain on prohibited species list
<i>Squatina squatina</i>	Angel shark	Ange de mer	Angelina	Retain on prohibited species list

General Biology

- Compared to other fish, elasmobranchs are:
 - Long-lived
 - Slow-growing
 - Late maturing
 - Low fecundity
- Extremely vulnerable to over-fishing, as stocks take long time to recover

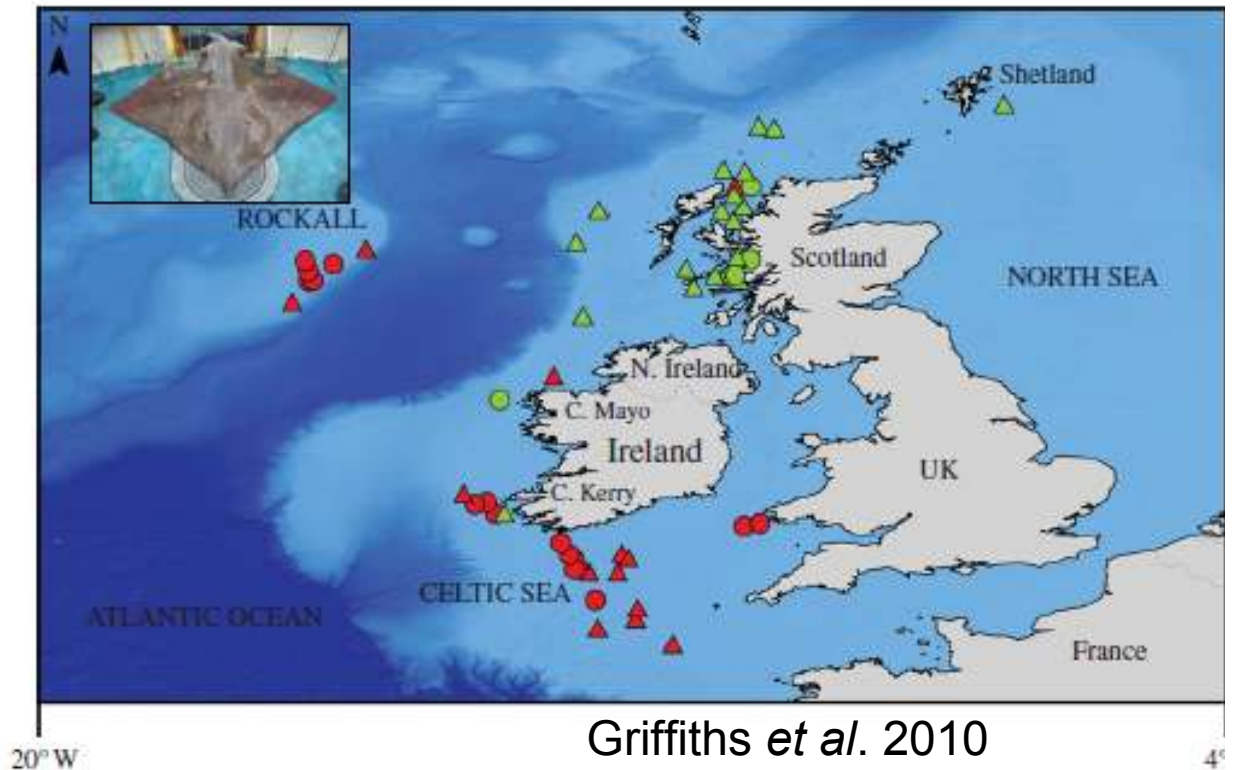
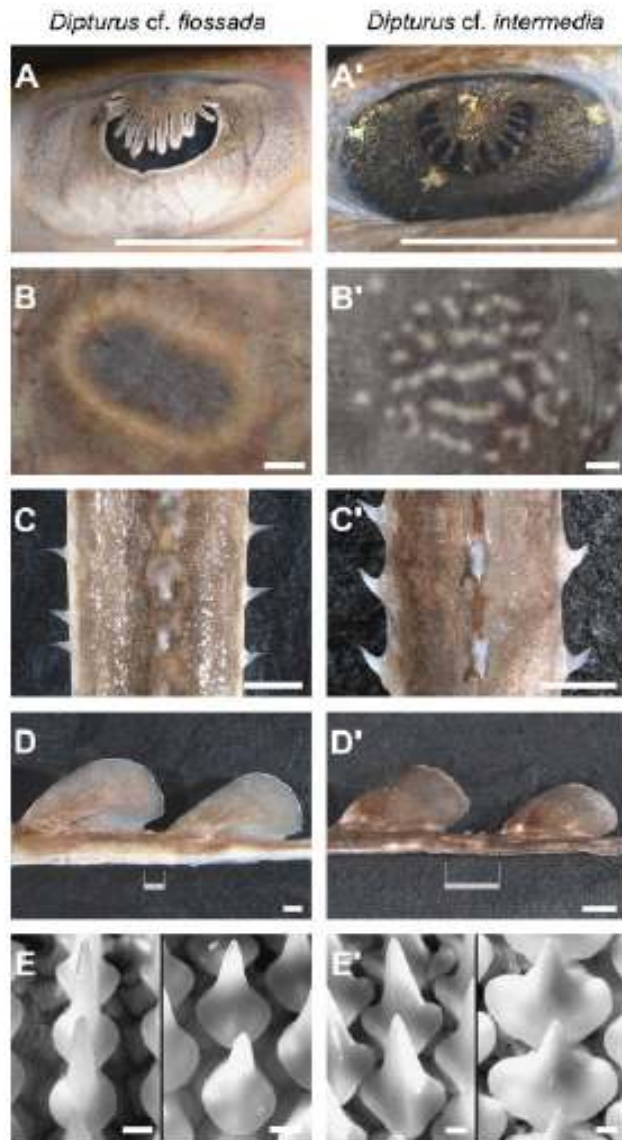
Terms Used

- K – growth rate
- L_{∞} - Hypothetical maximum length
- Fecundity – Number of eggs laid, or number of pups born

Dipturus spp

- What was *Dipturus batis* is now considered as two distinct species
 - *Dipturus cf. flossada*
 - *Dipturus cf. intermedia*

Dipturus spp. Identification



Griffiths *et al.* 2010

Δ *Prob. Dipturus intermedia*

Δ *Prob. Dipturus flossada*

Iglesias *et al.* 2009

Dipturus cf. flossada

- Length at maturity (m) 115cm
- Length at maturity (f) 122cm
- Age at maturity (m) 11
- Age at maturity (f) 11
- L_{∞} ?

Dipturus cf. intermedia

- Length at maturity (m) 185cm
- Length at maturity (f) 197cm
- Age at maturity (m) 19-20
- Age at maturity (f) 19-20
- L_{∞} 254cm

Dipturus spp. status

- Status: *Dipturus* spp. Considered extirpated in Irish Sea, depleted in other areas.
- *D. intermedia* probably more vulnerable due to larger size and very late maturity.
- ICES Advice for *D. batis complex*: No targeted fisheries



Spawning season –
May-September
(Bristol Channel)

K = 0.135 (m), 0.093 (f)
(Irish Sea)

K=0.09 (Bristol Channel)

Fecundity 62-74

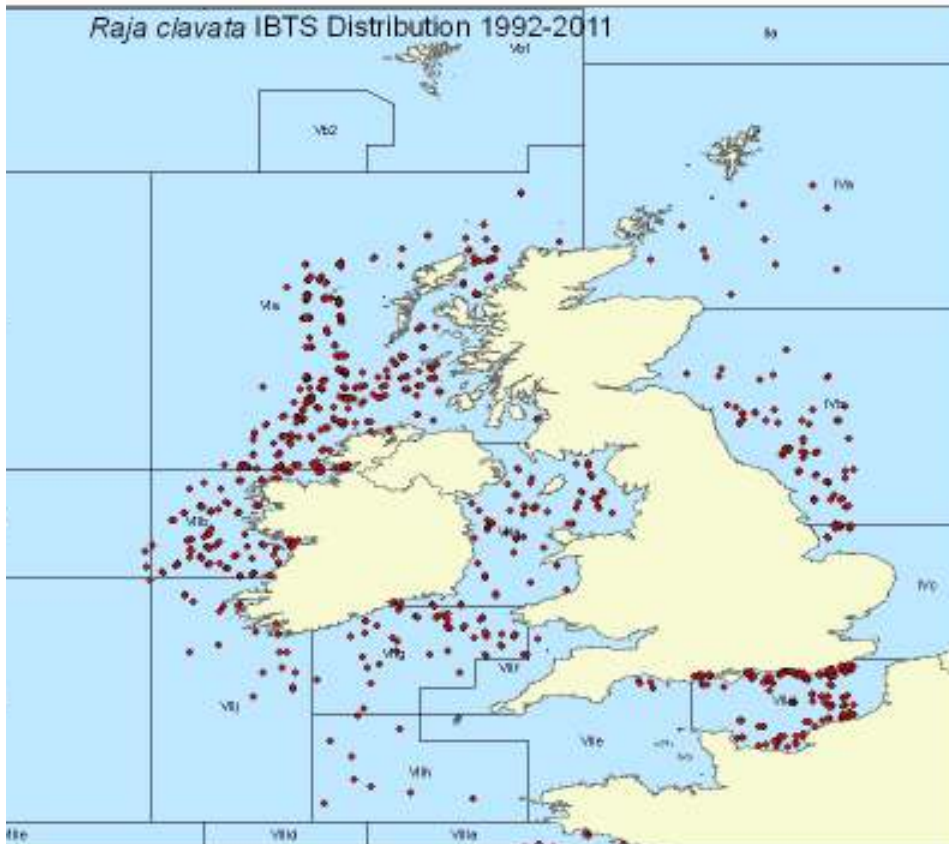
Length at maturity (m)
82cm

Length at maturity (f) 82 cm

Age at maturity (m) 6

L_{∞} : male 106cm, female 139.5 cm

Maximum Age 12



Raja clavata

➤ Status:

- VI – Stable / Increasing
- VII a,f,g – Stable / Increasing
- VIIe – Uncertain

➤ Advice: Status quo catch

Raja brachyura

$K = 0.145 - 0.19(m), 0.13 - 0.19$
(f) Irish Sea

Fecundity 40-90

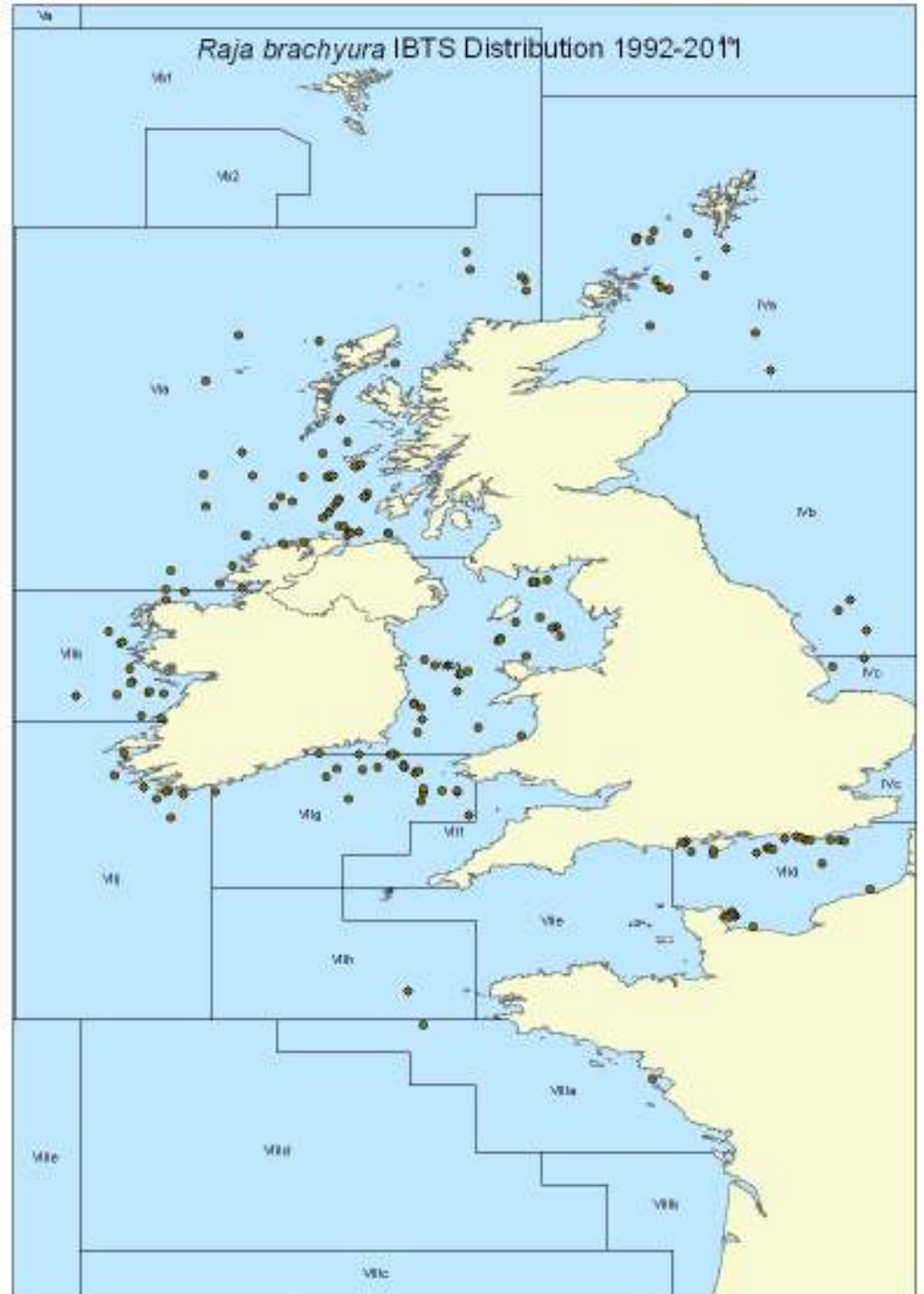
Length at maturity (m) 82 cm

Length at maturity (f) 84 cm

Age at maturity (m) 4

Age at maturity (f) 5

L_{∞} : male 145 cm, female 154



Raja brachyura

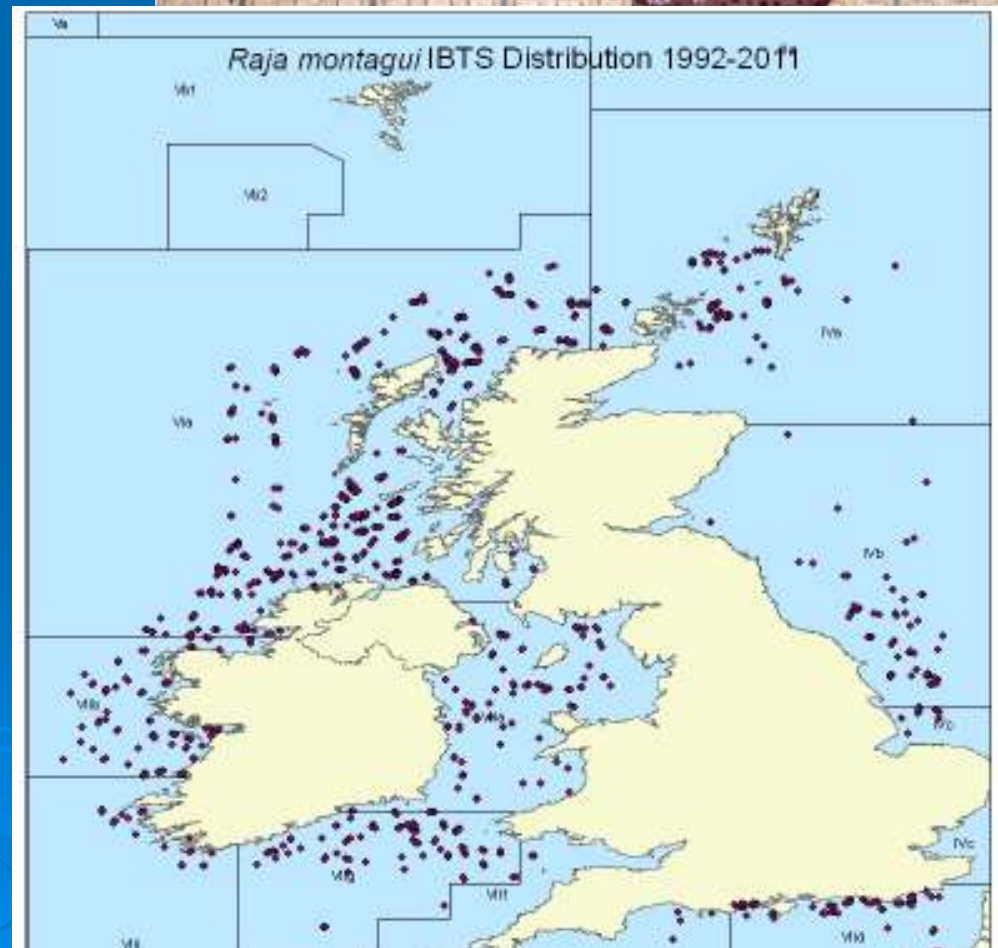
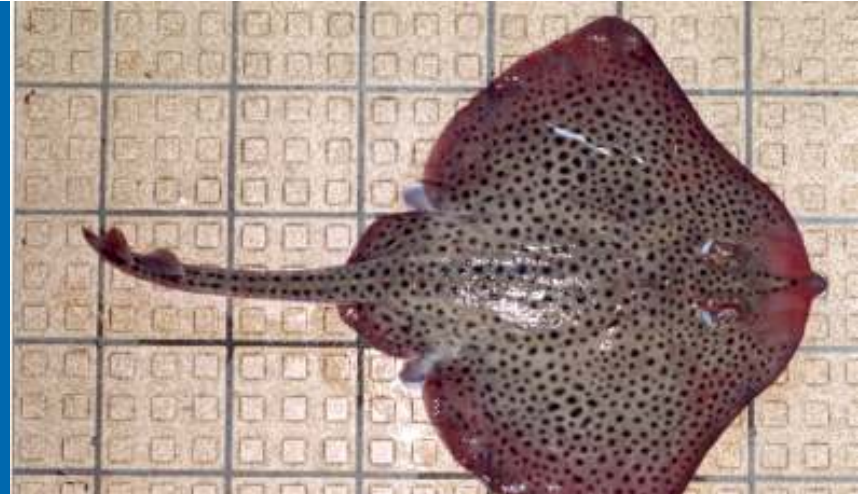
➤ Status:

- Uncertain. No trends are evident from surveys
- Patchy distribution. Locally abundant in Irish Sea and Bristol Channel
- Identification issues with *Raja montagui*

➤ Advice: No advice

Raja montagui

- Spawns Feb-June (Bristol Channel)
- In Irish Sea they are very fast growing/maturing compared to other ray species and compared to *R. montagui* in other areas.
- $K = (m) 0.304$ (f) 0.296 (Irish Sea)
- $K = (m) 0.19$ (f) 0.21 (North Sea)
- Length at maturity (m and f) 56 cm
- Age at maturity (m) 3
- Age at maturity (f) 4
- L_{∞} (m) 72cm (f) 78cm
- Maximum Age 8.



Raja montagui

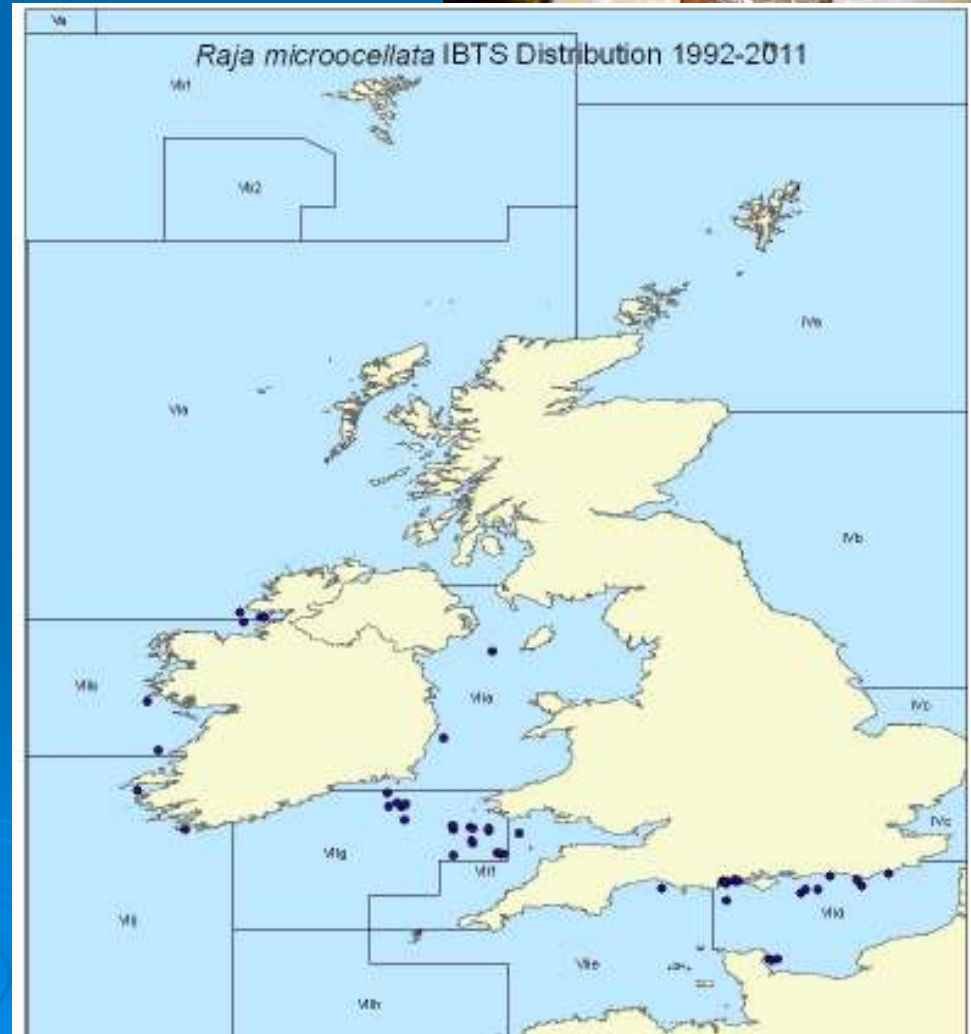
➤ Status

- VI – Stable / Increasing
- VIIa,f,g – Stable / Increasing
- VIIe – Uncertain
- Identification issues with *Raja brachyura*

➤ Advice: Status quo catch

Raja microocellata

- Spawning season – June-September (Bristol Channel)
- $K = 0.086$
- Fecundity - 54-61
- Length at first maturity (m) - 58.0 cm
- Length at first maturity (f) - 57.5 cm
- L_{∞} combined sexes 137cm (VIIIf) (Max observed size 91cm)
- Maximum Age 12



Raja microocellata

➤ Status

- Stable at low levels in main stock area (VIIIf).
- Only occasionally found, or in small local populations, in other parts of this ecoregion.

➤ Advice: Status quo catch (VIIIf), no advice for other subdivisions



Raja undulata

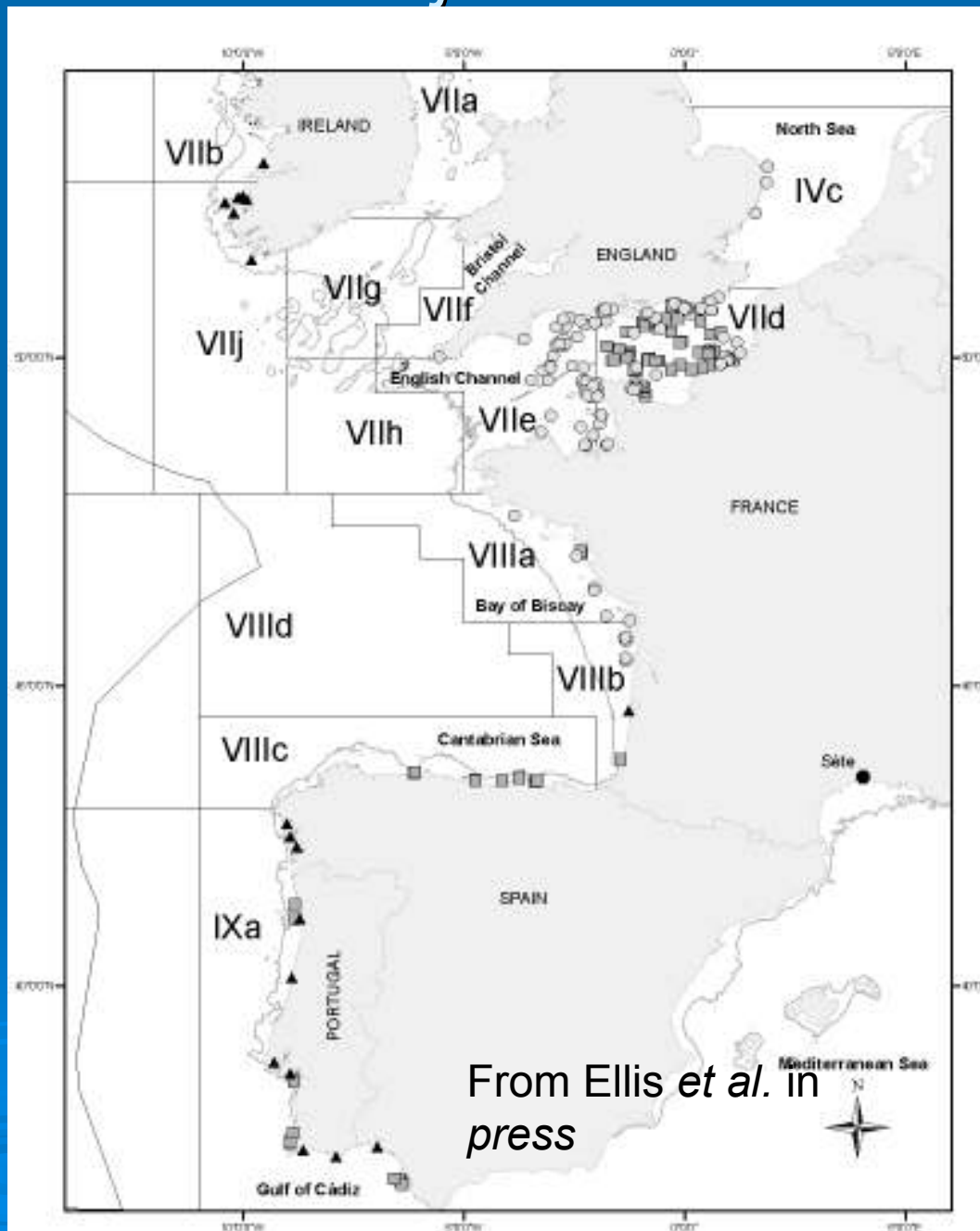
Info only available from Portugal.
Spawning season – Winter

$K = 0.124-0.149$ (m),
 $0.112-0.146$ (f)

Length at maturity (m) 73 cm
Length at maturity (f) 76 cm

Age at maturity (m) 9
Age at maturity (f) 9

L_{∞} (m) 112cm (f) 114cm
Maximum Age 13



Raja undulata

➤ Status:

- Locally common in discrete areas.
- Overall status unknown.
- Local stocks should be managed individually

➤ Advice: No targeted fishery



Leucoraja naevus



Smaller, more offshore species than other rays. Spawns year-round.

$K = 0.294$ (m), 0.197 (f) (Irish Sea)

$K = 0.108$ (Celtic Sea)

Fecundity - 90

Length at maturity (m) – 57 cm

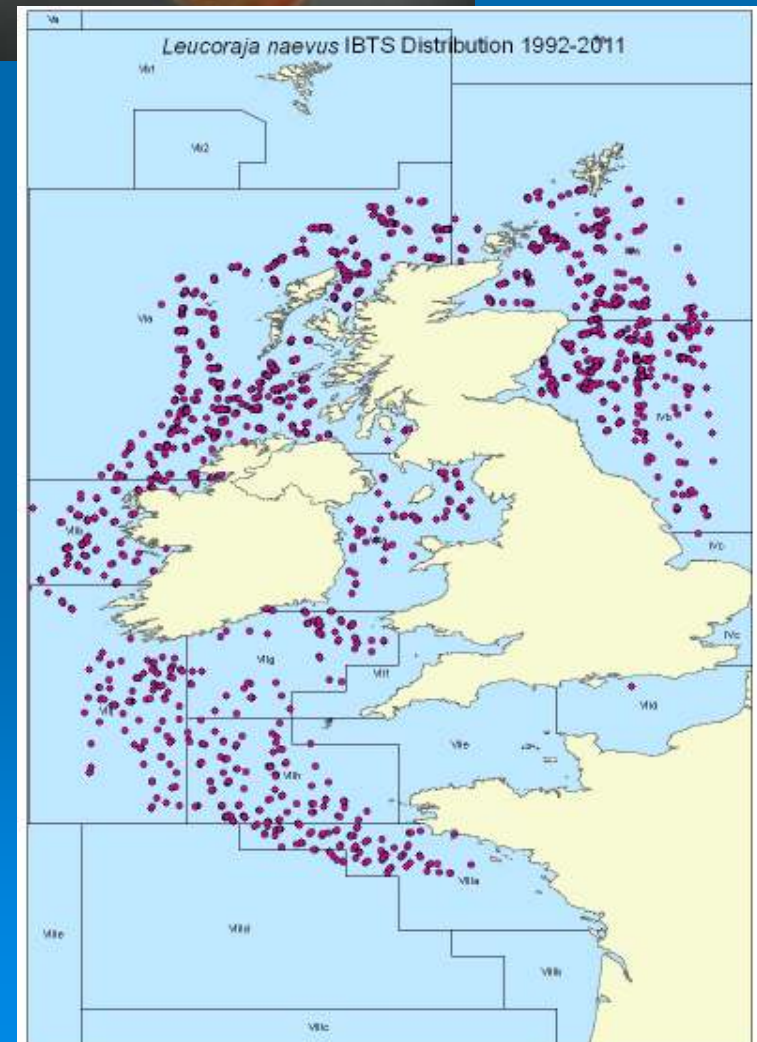
Length at maturity (f) - 56 cm

Age at maturity (m and f) – 4 (Irish Sea)

L_{∞} (m) 87.5 cm (f) 84cm (Irish Sea)

L_{∞} Sexes combined 92 cm (Celtic Sea)

Maximum Age 12 (Celtic Sea)



Leucoraja naevus

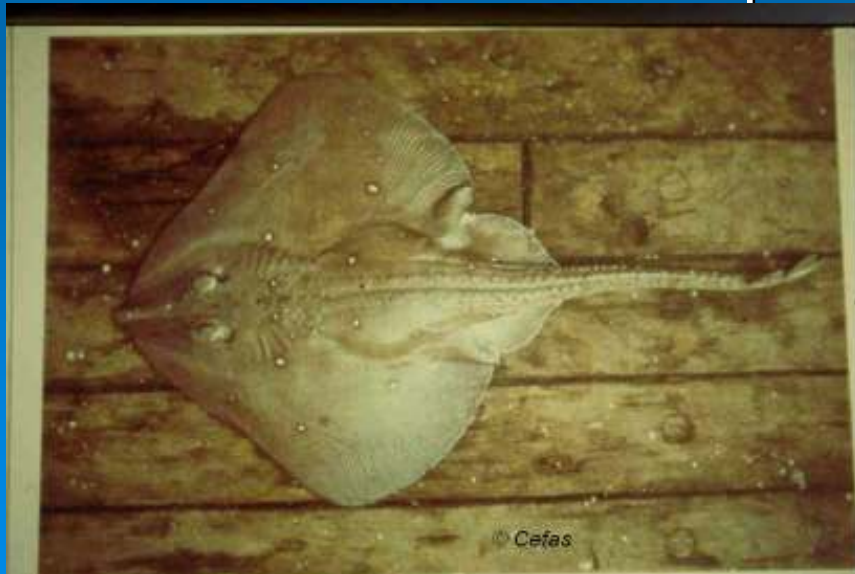
➤ Status:

- Area VI – Uncertain. Stock probably merges in to IV and VII
- Area VII – Uncertain. Commercial LPUE is declining. No survey trends evident
- Different surveys demonstrate slightly different trends in relative abundance for this species, which further highlights the need to better understand stock structure.

➤ Advice: Reduce from recent catch level

Leucoraja circularis and *Leucoraja fullonica*

- Offshore species, now only commonly found on Porcupine bank. Distribution now in deeper waters.
- Varying time series, with peak catch in 2003.
- *L. circularis* max size 100-120cm.
- *L. fullonica* max size 120cm
- No advice for these species



Deepwater skates

Dipturus nidarosiensis & *Dipturus oxyrinchus*

Dipturus nidarosiensis

- Appeared in 1% of Irish skate landings.
- Maximum size >200cm

Dipturus oxyrinchus

- Length at maturity (m) 70-80cm, (f) 90cm
- Maximum size 150cm (Mediterranean)
- No specific advice



Rostroraja alba

- Size at Maturity: 130cm (m), 120 cm (f)
 - Only discrete local populations.
 - No survey records since 1980.
 - Fecundity 55-156 eggs per year.
 - Gestation 15 months.
 - Maximum recorded size 200cm.
-
- Advice: Maintain on prohibited species list



Squatina squatina

Small, fragmented, local populations.

Tagging studies show some movement from these areas.

Fecundity 7-18

2 year reproductive cycle

Length at maturity 80-124 (m), 128-169 (f)

Max length 244cm (f)

ICES Advice: Retain on prohibited species list.



Issues of Concern

- Misidentification
- Discarding levels
- Survey timings – none in Q2 when several species spawn.
- Protecting spawning stock by protecting spawning females and/or nursery grounds can be a powerful tool