

### 3. Blue skate (*Dipturus batis*)

#### Sensitivity Assessment

**Table A11.3. Sensitivity assessment for the blue skate (*Dipturus batis*).** Associated sectors include activities related to offshore renewable energy (O), Fishing (F), or shipping (S). NR = not relevant, NA = not assessed, NEv = no evidence, H = high, M = medium, L = low, VL= very low, NS = not sensitive.

Pressures		Associated sector(s)	Resistance				Resilience				Sensitivity				References
Classification	Pressure type		Score	QoE	AoE	DoC	Score	QoE	AoE	DoC	Score	QoE	AoE	DoC	
Physical	Physical loss (to land or freshwater habitat)	O	None	H	H	H	VL	H	H	H	H <sup>1</sup>	H	H	H	-
	Physical change (to another seabed type)	O, F	M	L	M	M	M	L	M	M	M <sup>2</sup>	L	M	M	6, 8, 15
	Physical change (to another sediment type)	O, F	M	L	M	M	M	L	M	M	M	L	M	M	6, 8, 15

Pressures		Associated sector(s)	Resistance				Resilience				Sensitivity				References
Classification	Pressure type		Score	QoE	AoE	DoC	Score	QoE	AoE	DoC	Score	QoE	AoE	DoC	
	Habitat structure change-removal of substratum (extraction)	O	M	L	NR	NR	M	L	NR	NR	M <sup>3</sup>	L	NR	NR	6, 8, 15

Physical	Abrasion/disturbance of substratum surface or seabed	O, F	M	L	M	M	M	L	M	M	M	L	M	M	6, 8, 15 and FeAST sensitivity assessment 2023 as 'common skate complex'; 'eggcases laid on sandy, muddy flats (Neal et al., 2008), any disturbance to these areas may affect population abundances due to removal of egg cases.'
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Pressures		Associated sector(s)	Resistance				Resilience				Sensitivity				References
Classification	Pressure type		Score	QoE	AoE	DoC	Score	QoE	AoE	DoC	Score	QoE	AoE	DoC	
	Penetration or disturbance of substratum subsurface	O, F	M	L	M	M	M	L	M	M	M <sup>3</sup>	L	M	M	6, 8, 15
	Changes in suspended solids (water clarity)	O, F	NEv	NR	NR	NR	NEv	NR	NR	NR	NEv	NR	NR	NR	-
	Smothering and siltation changes (light)	O	NEv	L	NR	NR	NEv	L	NR	NR	NEv	L	NR	NR	-
Physical	Smothering and siltation changes (heavy)	O	L	L	H	L	M	L	H	L	M	L	H	L	FeAST sensitivity assessment 2023 as 'common skate complex'
	Underwater noise	O, F, S	H	L	L	NR	H	L	L	NR	NS <sup>4</sup>	L	L	NR	-

Pressures		Associated sector(s)	Resistance				Resilience				Sensitivity				References
Classification	Pressure type		Score	QoE	AoE	DoC	Score	QoE	AoE	DoC	Score	QoE	AoE	DoC	
	Electromagnetic energy	O	NEv	L	L	NR	NEv	L	L	NR	L	L	L	NR	FeAST sensitivity assessment 2023 as 'common skate complex'
	Barrier to species movement	O, F	M	L	L	NR	H	L	L	L	L	L	L	NR	FeAST sensitivity assessment 2023 as 'common skate complex'

Pressures		Associated sector(s)	Resistance				Resilience				Sensitivity				References
Classification	Pressure type		Score	QoE	AoE	DoC	Score	QoE	AoE	DoC	Score	QoE	AoE	DoC	
	Death or injury by collision	O, F, S	M	NR	NR	NR	M	NR	NR	NR	M	NR	NR	NR	FeAST sensitivity assessment 2023 as 'common skate complex'
Hydrological	Water flow changes	O	H	M	M	NR	M	M	M	NR	M <sup>5</sup>	M	M	NR	6-8, 15
Chemical	Transition elements & organo-metal contamination	O, F, S	NEv	L	M	NR	NEv	L	NR	NR	Sensitive	L	NR	NR	FeAST sensitivity assessment 2023 as 'common skate complex'

Pressures		Associated sector(s)	Resistance				Resilience				Sensitivity				References
Classification	Pressure type		Score	QoE	AoE	DoC	Score	QoE	AoE	DoC	Score	QoE	AoE	DoC	
	Hydrocarbon & PAH contamination	O, F, S	NEv	L	M	NR	NEv	L	NR	NR	Sensitive	L	NR	NR	FeAST sensitivity assessment 2023 as 'common skate complex'
	Synthetic compound contamination	O, F, S	NEv	NR	NR	NR	NEv	NR	NR	NR	Sensitive	NR	NR	NR	FeAST sensitivity assessment 2023 as 'common skate complex'
	Introduction of other substances	O, F, S	NEv	NR	NR	NR	NEv	NR	NR	NR	NEv <sup>6</sup>	NR	NR	NR	-

Pressures		Associated sector(s)	Resistance				Resilience				Sensitivity				References
Classification	Pressure type		Score	QoE	AoE	DoC	Score	QoE	AoE	DoC	Score	QoE	AoE	DoC	
	Deoxygenation	O	NR	NR	NR	NR	NR	NR	NR	NR	NS	NR	NR	NR	FeAST sensitivity assessment 2023 as 'common skate complex'
Biological	Introduction or spread of invasive non-indigenous species	O, F, S	NEv	NR	NR	NR	NEv	NR	NR	NR	NEv <sup>6</sup>	NR	NR	NR	-
	Removal of target species	F	L	H	H	H	L	H	H	H	H <sup>7</sup>	H	H	H	2-5, 7, 9 – 14, 17, 18, 21 - 29
	Removal of non-target species	F	L	H	H	H	L	H	H	H	H <sup>7</sup>	H	H	H	1-5, 7, 9, 13, 17-25, 29



<sup>1</sup> H sensitivity assessment based MaRESA guidelines of benthic, sessile organisms. Differs from FeAST sensitivity of Not Exposed as it appears to be based on adults and juveniles only; 'mobile species and can avoid unsuitable areas.'

<sup>2</sup> M sensitivity assessment based on ecological understanding of the flapper skate egg laying and previous literature based on the common skate complex. Differs from FeAST sensitivity of L as it appears to be based on adults and juveniles only; 'mobile species and can avoid unsuitable areas.'

<sup>3</sup> M sensitivity assessment based on ecological understanding of the flapper skate and 'common skate complex'. Differs from FeAST sensitivity of NA; 'The skate is highly mobile and will remain unaffected by any changes in the substrate. There are questions over potential impacts on egg cases. current evidence shows they are predominantly found on rocky habitats, although it is possible they may occur on sediment.' 'Penetration and damage to the soft rock substrata are considered, however, penetration into hard bedrock is deemed unlikely.'

<sup>4</sup> NS sensitivity assessment based on ecological understanding of elasmobranchs. Differs from FeAST sensitivity of Not Assessed.

<sup>5</sup> L sensitivity assessment based on ecological understanding of flapper skate (a suitable proxy) egg cases. Differs from FeAST sensitivity of NS.

<sup>6</sup> NEv sensitivity assessment based on ecological understanding of the common skate complex. Differs from FeAST sensitivity of NA.

<sup>7</sup> H sensitivity assessment based on ecological understanding of the common skate complex, fishing and elasmobranch survival in fisheries captures. Differs from FeAST sensitivity of NR for removal on target species and L of non-target species.

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*Appendix 11 Sensitivity Analyses - 3 Blue Skate*

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Literature search

#### **Search term output (clarified) 09/02/24**

AB=("blue skate" OR "Dipturus batis" OR "D. batis" OR "gray skate" OR "grey skate" OR "pocheteau" OR "pochette" OR "Glattroch\*" OR "Glattskate" OR "Glattrokke" OR "Storskate" OR "Skata" OR "Razza bavosa" OR "Razza cappuccina" OR "Razza comune" OR "Raia oirega" OR "Raya noruega" OR "Vleet" OR "flapper skate" OR "Dipturus intermedius" OR "D. intermedius" OR "Raia intermedia" OR "blue grey skate" OR "Intermediate skate" OR "common skate" OR "flossada" OR "R. intermedia") AND AB= ("angl\*" OR "beam" OR "bottom trawl\*" OR "by-catch" OR "dredge\*" OR "fish\*" OR "gear" OR

"gillnet\*" OR "hook\*" OR "injury" OR "net\*" OR "otter trawl\*" OR "remov\*" OR "aggregate\*" OR "anchor\*" OR "ballast" OR "barrier\*" OR "beach\*" OR "launch\*" OR "moor\*" OR "noise" OR "ship\*" OR "steaming" OR "collision\*" OR "construction" OR "electro\*" OR "turbine\*" OR "renewable\*" OR "wave" OR "wind" OR "wind farm\*" OR "anoxia" OR "copper" OR "current\*" OR "disease\*" OR "disturbance" OR "endocrine disru\*" OR "eutrophication" OR "exposure" OR "heavy metals" OR "hydrocarbon" OR "hypoxia" OR "litter" OR "nitrate\*" OR "nitrite\*" OR "noise" OR "radionuclide" OR "nutrient\*" OR "oil" OR "oil" OR "PAH\*" OR "pathogen\*" OR "PCB\*" OR "plastic\*" OR "regime" OR "salinity" OR "sedimentation" OR "silt\*" OR "temperatur\*" OR "translocation" OR "tributyltin" OR "turbid\*" OR "visual" OR "warm\*")

Generic terms such as "Raia", "Skate" or "Raja" were not used here as they produced 1000s of resultant papers that were not relevant to this specific species. Only vernacular names ranked as commonly used by Fishbase are used in the search, which includes common French, Italian and Spanish names.

## **Database**

ISI Web of Science

## **Search date**

9th February 2023 – 102 results (four review articles, 20 early access, 43 open access, seven associated data, 14 enriched cited references)

[https://www.webofscience.com/wos/woscc/summary/b5420964-18cb-484b-beee-8ea168670be0-cb888c37/relevance/1\(overlay:export/exbt\)](https://www.webofscience.com/wos/woscc/summary/b5420964-18cb-484b-beee-8ea168670be0-cb888c37/relevance/1(overlay:export/exbt))

## **Search output and screening process**

Due to the common skate problem and identification problems of skate species in the literature, pressures relating to *Dipturus batis* and *Dipturus intermedius* were searched for. Abstracts screened for relevance i.e. must describe common, blue or flapper skate (including other vernacular names) and mention of one of the listed sectors and/or pressures from MARESA. Workflow follows the Rapid Evidence Assessment approach. The title and all auxiliary information (including abstract) were downloaded from ISI Web of Science in a .ris and excel format. In Excel, abstracts were read and listed to either pass or fail the initial screening process with a reason provided.

## **Outcome from screening**

9 February 2024: 30 (29%) abstracts passed initial screening, 1 (1%) could not be accessed and thus applicability could not be determined, 29 (28%) passed secondary screening and were accessible. None of the articles explicitly investigate any of the relevant pressure, although some present information which is relevant to the common and flapper skate sensitivity assessment. The majority of articles make some reference to the historical impact of commercial fishing on skate populations.

