

## 15. Atlantic Salmon (*Salmo salar*)

### Sensitivity Assessment

No existing MarESA or FeAST sensitivity assessments for salmon were available, therefore a full literature search and MarESA assessment were conducted. The OSPAR status assessment in 2022 covered the majority of the identified pressures and was used to supplement the MarESA results. A recent review of marine stressors impacting salmon (Gillson *et al.*, 2022) identified major sensitivities and supporting literature. To identify key considerations in the Celtic Sea, an external expert in the subject area was also consulted. The following sensitivity assessment is therefore based on the MarESA protocol and OSPAR assessment supplemented with key literature.

**Table A11.15. Sensitivity assessment for Atlantic Salmon (*Salmo salar*).** 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, NS = not sensitive.

Pressures		Associated sector(s)	Resistance				Resilience				Sensitivity			
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	H	H	H
	Physical change (to another seabed type)	O, F	None	H	H	H	VL	H	H	H	H	H	H	H

Pressures		Associated sector(s)	Resistance				Resilience				Sensitivity			
Classification	Pressure type		Score	QoE	AoE	DoC	Score	QoE	AoE	DoC	Score	QoE	AoE	DoC
	Physical change (to another sediment type)	O, F									NEv	NR	NR	NR
	Habitat structure change-removal of substratum (extraction)	O									NEv	NR	NR	NR
	Abrasion/disturbance of substratum surface or seabed	O, F									NEv	NR	NR	NR
Physical	Penetration or disturbance of substratum subsurface	O, F									NEv	NR	NR	NR
	Changes in suspended solids (water clarity)	O, F									NA	NR	NR	NR

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Pressures		Associated sector(s)	Resistance				Resilience				Sensitivity			
Classification	Pressure type		Score	QoE	AoE	DoC	Score	QoE	AoE	DoC	Score	QoE	AoE	DoC
	Smothering and siltation changes (light)	O									NEv	NR	NR	NR
	Smothering and siltation changes (heavy)	O									NEv	NR	NR	NR
	Underwater noise	O, F, S									M	L	M	L
	Electromagnetic energy	O	M	M	M	L	L	L	M	L	M	L	M	L
	Barrier to species movement	O, F	L	H	H	H	L	H	H	H	H	H	H	H
	Death or injury by collision	O, F, S	L	H	H	H	L	H	H	H	H	H	H	H
Hydrological	Water flow changes	O									NEv	NR	NR	NR

Pressures		Associated sector(s)	Resistance				Resilience				Sensitivity			
Classification	Pressure type		Score	QoE	AoE	DoC	Score	QoE	AoE	DoC	Score	QoE	AoE	DoC
Chemical	Transition elements & organo-metal contamination	O, F, S									Sensitive	H	H	H
	Hydrocarbon & PAH contamination	O, F, S									Sensitive	H	H	H
	Synthetic compound contamination	O, F, S									Sensitive	H	H	H
Chemical	Introduction of other substances	O, F, S									Sensitive	H	H	H
	Deoxygenation	O									Sensitive	H	H	H
Biological	Introduction or spread of invasive non-indigenous species	O, F, S									Sensitive	H	H	H

Pressures		Associated sector(s)	Resistance				Resilience				Sensitivity			
Classification	Pressure type		Score	QoE	AoE	DoC	Score	QoE	AoE	DoC	Score	QoE	AoE	DoC
	Removal of target species	F	L	H	H	H	VL	H	H	H	H	H	H	H
	Removal of non-target species	F	L	H	H	H	VL	H	H	H	H	H	H	H

## Key references for sensitivity assessment

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## Literature Search

### Web of Science search terms

("Salmo salar" OR "S. salar") AND ("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 "deoxy\*" OR "disease\*" OR "disturbance" OR "endocrine disru\*" OR "eutrophication" OR "exposure" OR "heavy metals" OR "hydrocarbon" OR "hypoxia OR litter\*" OR "non-native\*" OR "nitrate\*" OR "nitrite\*" OR "noise" OR "radionuclide" OR "nutrient\*" OR "oil" OR "PAH\*" OR "PCB\*" OR "regime" OR "sedimentation" OR "silt\*" OR "tributyltin" OR "turbid\*")

### Database

ISI Web of Science

### Search date

7th February 2024 - 5,035 results

<https://www.webofscience.com/wos/woscc/summary/a439c152-8f07-499e-b2f2-bd3f80ea38f7-d614734f/relevance/1>

### Search output and screening process

Workflow follows the Rapid Evidence Assessment. Web of Science only exports the first 1,000 results. The titles of these 1,000 papers were screened for relevance i.e. must describe salmon and mention of one of the listed sectors and/or pressures from MARESA. A second screening of abstracts was then conducted. The large number of initial results was due to the fact that salmon are widely used in aquaculture, however many of these reports were not of relevance to wild salmon under natural marine conditions. >4,000 pieces of literature were unscreened, hence the importance of the review papers and OSPAR assessment.

### **Outcome from screening**

54 papers passed the first screening and 30 of these passed the second. These 30 papers formed the basis of the sensitivity assessment, supplemented with the latest reviews, OSPAR report and IUCN Red List assessments

