

Environment, Climate Change and Land Reform Committee

Environmental impacts of salmon farming

Written submission from Whale and Dolphin Conservation (WDC)

Whale and Dolphin Conservation (WDC) is the leading charity dedicated to the protection of whales and dolphins. Our vision is a world where every whale and dolphin is safe and free. We welcome the opportunity to provide written evidence on the 'Review of the Environmental Impacts of Salmon Farming in Scotland' report.

Overall, the main issues concerning the impacts of salmon farming on marine mammals in Scotland have been addressed in the review. WDC has serious concerns about the potential impacts of salmon fish farms on marine mammals in Scotland, especially harbour porpoise, and grey and harbour seals. We would like to take this opportunity to provide further information on our main concerns below:

Acoustic Deterrent Devices (ADDs)

Cetaceans (whales, dolphins and porpoises) are very sensitive to underwater noise. To date, the primary non-lethal method for controlling predators at salmon farms is the use of ADDs. It is important to establish the extent of ADD use at fish farms to help inform management and policy. Around half of fish farms in Scotland are thought to use ADDs and usage is largely unregulated, including no monitoring of the effectiveness of the devices or the impact on other species (Coram et al., 2016). Disturbance and habitat exclusion due to ADDs has been shown to affect a range of cetacean species that can be found in proximity to aquaculture facilities in Scotland (e.g., Johnston, 2002; Morton and Symonds, 2002; Olesiuk et al., 2002; Booth, 2010; Northridge et al., 2010, 2013; Brandt et al., 2012, Lepper et al., 2014; McGarry et al., 2017).

Acoustic signals from ADDs can be detected at more than 14km from the sound source (Northridge et al., 2010). Direct impacts to harbour porpoise relating to aquaculture include the use of commercially available ADDs that can cause injury, stress, hearing damage and behavioural disturbance (displacement). Modelling of the exposure time to exceed injury criteria for seals and porpoises at given ranges from active ADDs suggest that there is a credible risk of exceeding injury criteria for both seals and porpoises (Lepper et al., 2014).

Furthermore, the effectiveness of ADDs to deter seals is questionable. As noted in the review, seals are frequently seen around fish farm facilities actively using ADDs and to date there is no peer-reviewed evidence to show that they are effective in reducing seal depredation (Götz and Janik, 2013). Given the impacts on porpoises and the questionable effectiveness to deter seals, there should be a presumption against the use of ADDs in favour of more robust and benign solutions.

The majority of salmon farms on the west coast of Scotland are located within the candidate Inner Hebrides and Minches Special Area of Conservation (cSAC) for harbour porpoise which has recently been accepted by the European Commission. Potential impacts on harbour porpoise due to disturbance from ADDs would be

considered against the Habitats Directive (92/43/EEC). For ADDs to be used within the SAC, an Appropriate Assessment would be required for each site. The Appropriate Assessment(s) must include full details of the devices specifics, details of use (length of time, frequency, number of devices, etc.) and a full assessment of the impacts on cetacean species inhabiting the area, namely harbour porpoise, minke whale, killer whale and bottlenose dolphin.

ADD use should be considered in a harbour porpoise Hebrides and Minches SAC management scheme.

Potential impacts from ADDs would need to be considered cumulatively (including potential impacts from vessels associated with the fish farms and other developments) and in-combination e.g., with ADDs at other sites and other marine spatial planning within the management unit of each species.

There is the potential for disturbance to European Protected Species (EPS) so EPS licensing of ADDs should occur, including where the presence of ADD may cause a barrier to passage, e.g., around straits, sounds and embayments, or in favoured porpoise feeding habitat such as headlands and tidal upwellings (Northridge et al., 2010).

Should they remain in use, the application of ADDs needs to be reviewed, strictly regulated and monitored to ensure that at current levels and with any future expected expansion of the salmon farming industry, there is no impact on the integrity of the harbour porpoise SAC.

Clear, transparent and precautionary guidance around the use of existing and future ADDs should be produced, including in circumstances where ADDs could be used / not used, and if used, what conditions are needed. Monitoring effectiveness and impact should be a condition for use of ADDs. Clarity on the use of mitigation measures and licensing conditions is essential, to ensure consistent case by case assessment of facilities.

However, there should be a presumption against the use of ADDs in favour of more robust and benign solutions, particularly in protected areas. The mandatory use of anti-predator devices, such as tensioned nets and seal blinds, is a preferred method of reducing seal predation that would not have an acoustic displacement impact on harbour porpoise and other wildlife. The siting of aquaculture facilities away from important sites for seals and harbour porpoises would reduce local impacts and associated requirement for other management measures.

Seal shooting

As there is not an enforceable requirement for licensed marksmen to recover every carcass, it is possible the cases submitted for examination at necropsy are not representative of the total population of seals shot under management licences (Brownlow and Davison, 2013). Scottish stranding records show that the number of shot seals is much higher than formally reported to the Scottish Marine Animal Stranding Scheme (SMASS) (SMASS, unpublished data). Therefore, licencing

requirements, such as reporting to the SMASS and Marine Scotland are often not fulfilled.

Lethal shooting of seals (grey and harbour) is a welfare issue. It is also a conservation concern where harbour seal populations are declining. Necropsied seals have shown evidence of not dying instantly after being shot, not being shot as required by the Scottish Seal Management Code of Practice Code and dead seals include pregnant and lactating females, which increases the number of deaths and raises welfare concerns for dependant seal pups (Nunny et al., 2016).

A US Import Ruling will be implemented in 5 years that does not allow the import of fish or fish products where marine mammals have been intentionally killed, including farmed salmon. Scottish fish farms are included in the assessment that is currently underway in the US.

The shooting of seals needs to stop, however until the practise is stopped the following are:

- It should be a requirement for licensed marksmen to recover, tag or uniquely identify every carcass (Brownlow and Davison, 2013).
- Recovered carcasses are necropsied in order to properly assess the welfare implications of current seal shooting practice (Nunny et al., 2016).

We have serious concerns regarding existing and new aquaculture sites in areas near to seal haul-outs and where seals are frequently observed. As mentioned previously, aquaculture facilities should be sited away from important sites for seals and tension nets and seal blinds should be used at salmon aquaculture facilities to mitigate seal predation.

Entanglements in aquaculture facilities

We also have concerns about potential entanglements, collisions and the impact of increase use of the area from fish farm vessels. However, to avoid the use of ADDs, tension nets should be used instead. If tension nets are used correctly, there should be no loose netting and therefore the risk of entanglements to marine mammals (and other species such as basking sharks and birds) is significantly reduced.

Presently there is a lack of information on marine mammal entanglements at salmon fish farms. Stakeholders should be encouraged to report entanglements to the relevant authorities.

Chemical pollution

A range of chemicals are used in salmon fish farming due to the treatment of sea lice and other pathogens, as well as chemicals in the equipment. The use of all chemicals should be strictly regulated until the impact(s) are fully understood and it has been demonstrated that there is no negative impact on the environment. Descriptors 8 and 9 of the Marine Strategy Framework Directive (2008/56/EC) cover contamination with the overall goal for Member States to achieve Good Environmental Status (GES) by 2020. Chemical pollution in marine mammals is

largely unknown, however, polychlorinated biphenyls (PCBs) (previously used in antifouling compounds) burden has been linked to reproductive failure in harbour porpoise (Murphy et al., 2015). Any impacts on cetaceans due to chemical pollution from salmon farming would be contrary to the 'strict protection' provided by the Habitats Directive.

Marine debris

The impact of marine debris from salmon farming in Scotland is not well known and needs to be investigated.

In conclusion, as noted in the review, there is an urgent need to develop non-lethal mitigation methods for predators such as seals. Shooting of seals is unnecessary, is a welfare issue and should be prohibited. Tension nets should be used to prevent predation by seals. The use of ADDs needs to be fully reviewed, limited, regulated and monitored.

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References

- Booth, C.G., 2010. *Variation in habitat preference and distribution of harbour porpoises in the west of Scotland*. PhD thesis, University of St Andrews. 240 pp.
- Brandt, M.J., Höschle, C., Diederichs, A., Betke, K., Matuschek, R., Witte, S. and Nehls, G. 2013. *Far-reaching effects of a seal scarer on harbour porpoises, Phocoena phocoena*. *Aquatic Conservation: Marine Freshwater Ecosystems* 23: 222–232.
- Brownlow, A. and Davison, N. 2013. *Seal Management Cases 1 January to 31 December 2013 for Marine Scotland, Scottish Government*. *Scottish Marine Animal Stranding Scheme*. 12 pp.
- Coram, A., Mazilu, M. and Northridge, S. 2016. *Plugging the gaps - improving our knowledge of how predators impact salmon farms. A study commissioned by the Scottish Aquaculture Research Forum (SARF)*. 42 pp.
- Götz, T. and Janik, V.M. 2013. *Acoustic deterrent devices to prevent pinniped depredation: efficiency, conservation concerns and possible solutions*. *Marine Ecology Progress Series* 492: 285–302.
- Johnston, D. W. 2002. *The effect of acoustic harassment devices on harbour porpoises (Phocoena phocoena) in the Bay of Fundy, Canada*. *Biological Conservation* 108: 113-118.
- Lepper, P.A., Gordon, J., Booth, C., Theobald, P., Robinson, S. P., Northridge, S. and Wang, L. 2014. *Establishing the sensitivity of cetaceans and seals to acoustic deterrent devices in Scotland*. *Scottish Natural Heritage Commissioned Report No. 517*. 121 pp.
- McGarry, T., Boisseau, O., Stephenson, S. and Compton, R. 2017. *Understanding the effectiveness of acoustic deterrent devices (ADDs) on minke whale (Balaenoptera acutorostrata), a low frequency cetacean*. ORJIP Project 4, Phase 2. RPS Report EOR0692. Prepared on behalf of The Carbon Trust.
- Morton, A. B. and Symonds, H. K. 2002. *Displacement of Orcinus orca (L.) by high amplitude sound in British Columbia, Canada*. *ICES Journal of Marine Science* 59: 71-80.
- Murphy, S., Barber, J., Learmonth, J.A., Read, F.L., Deaville, R., Perkins, M., Brownlow, A., Davison, N., Pierce, G.J., Law, R.J. and Jepson, P.D. 2015. *Reproductive failure in UK harbour porpoises Phocoena phocoena: legacy of pollutant exposure?* *PLOS ONE* 10: e0131085.
- Northridge, S., Coram, A. and Gordon, J. 2013. *Investigations on seal depredation at Scottish fish farms*. Edinburgh: Scottish Government. 79 pp.
- Northridge, S.P., Gordon, J.G., Booth, C., Calderan, S., Cargill, A., Coram, A., Gillespie, D., Lonergan, M. and Webb, A. 2010. *Assessment of the impacts and*

utility of acoustic deterrent devices. Final Report to the Scottish Aquaculture Research Forum, Project Code SARF044. 34 pp.

Nunny, L., Langford, F. and Simmonds, M. P. 2016. Does the seal licensing system in Scotland have a negative impact on seal welfare? Frontiers in Marine Science 3: 1-17.

*Olesiuk, P. F., Nichol, L.M., Sowden, M.J. and Ford, J.K.B. 2002. Effect of the sound generated by an acoustic harassment device on the relative abundance and distribution of harbor porpoises (*Phocoena**

phocoena) in Retreat Passage, British Columbia. Marine Mammal Science 18: 843-862.