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Marine Scotland Licensing Operations Team
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30 March 2022

MORAY FIRTH – MF01 - RIVER CARRON, RIVER DEVERON, RIVER FINDHORN, RIVER OYKEL, RIVER SHIN, RIVER SPEY RIVER NESS – SEAL LICENCE CONSULTATION

Marine Scotland Science have reviewed the relevant documentation and have provided the following comments.

Application
This application covers seven different rivers ([redacted] Findhorn, [redacted]) in the Moray Firth catchment, therefore information provided on seal presence, predation events witnessed, use of non-lethal measures and justification for takes is summarised across all rivers. Comments on salmon conservation status of each river in turn, together with specific comments on the seal licence applications for each river individually, are provided in separate responses:

[redacted]

[redacted]

[redacted]

[redacted]

2022-24-03- MORAY FIRTH - MF01 - RIVER FINDHORN - Seal Licence Consultation - MSS Response Letter details - Objective ECM (scotland.gov.uk)

[redacted]

[redacted]

Number of seals and feeding activity
The applicant has reported 10 instances of harbour seals and 21 instances of grey seals in the Findhorn, [redacted] rivers in the last year, across all seasons.

The applicant has witnessed 18 predation events by either harbour seals or grey seals in the Findhorn, [redacted] rivers in the last year, across all seasons.

The applicant has provided the following information on seal presence and feeding activity in the rivers: surveys for seals in the [redacted] and Findhorn rivers have been restricted by covid, but sightings still noted down.

MSS advise that without any evidence for the presence of seals within the rivers [redacted] the justification for granting licences to take seals is weaker than if such evidence were to be provided.

Interpretation of seal numbers provided is difficult because no information is provided on how they were collected and they are not effort related.

Number of seals requested on the licence

The NERC Special Committee on Seals (SCOS) reports to Scottish Government annually on Potential Biological Removal (PBR) numbers for the two resident seal species. These numbers represent the maximum anthropogenic take from the seal populations within a seal management area in order for the populations to be sustainable, and reflect both the population size and trend. Takes from shooting must be cumulated and assessed alongside all other anthropogenic takes of seals within the management area, including, for example, bycatch and collision with tidal turbines. We note that seals taken through bycatch and other incidental takes are not planned and are therefore difficult to cumulate for annual assessment. Bycatch data from previous years are also not produced at the same spatial scale as the seal management areas making their inclusion in considerations more complicated. As a result, MSS recommend that MS-LOT take a cautious approach to determining the number of licences for seal takes that can be issued.

The PBR limits advised by SCOS (2021) for seals in this seal management area are 370 for grey seal and 6 for harbour seal. To our knowledge, there are no other planned anthropogenic takes from the seal populations in this seal management area.

The total requested seals from all applications in the Moray Firth seal management area in 2022 is 30 grey seals and 8 harbour seal. MSS advise that the requested licences for grey seals fall well within the PBR limit for the seal management area both individually and cumulatively. However, the declining harbour seal population in this seal management area, and the correspondingly small PBR mean that there is limited capacity for to account for any bycatch or other incidental take from the harbour seal population. This leads MSS to recommend that no licences should be granted for harbour seals in this seal management area.

Non-lethal deterrents

The applicants have, in the case of the Findhorn, [redacted] rivers, provided evidence on the use of alternative non-lethal techniques to reduce seal predation. Some non-lethal techniques to reduce seal predation have been utilised on the [redacted] including harassment but ADDs were deemed not suitable. Noise harassment has been utilised on the [redacted] and starter pistols had limited success. Paintball guns will be trialled on the [redacted]. A previous attempt to relocate a harbour seal was unsuccessful. An ADD trial on the [redacted] in conjunction with SMRU was ineffective. Harassment techniques on the Findhorn have been been ineffective so far but there are plans to try boat approcaches and paintball guns. ADDs have been used on Findhorn previously to no effect.

MSS recommend that prior to lethal removal, applicants explore further non-lethal measures to reduce depredation or displace seals from critical areas of the river. These non-lethal measures have been extensively reviewed in a recent Marine Scotland report (Thompson et al. 2021).

References

Thompson, D, A J Coram, R N Harris and C E Sparling. (2021). Review of non-lethal seal control options to limit seal predation on salmonids in rivers and at finfish farms. Scottish Marine and Freshwater Science Vol 12 No 6, 136pp. DOI: 10.7489/12369-1
https://data.marine.gov.scot/dataset/review-non-lethal-seal-control-options-limit-seal-predation-salmonids-rivers-and-finfish-0

Hopefully these comments are helpful to you. If you wish to discuss any matters further then please contact the REEA Advice inbox at MSS_Advice@gov.scot

Yours sincerely,

Renewable Energy Environmental Advice
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30 March 2022

MORAY FIRTH – MF01– RIVER FINDHORN – SEAL LICENCE CONSULTATION

Marine Scotland Science have reviewed the relevant documentation and have provided the following comments.

Application
This application covers the River Findhorn.

Salmon stocks
The most up to date stock assessment of salmon in the River Findhorn indicates that the overall stock is in good conservation status. However, recent declines in the number of salmon returning to Scotland have led SG to determine that this is a crisis point for salmon leading to the launch of a Wild Salmon Strategy.

In additional to the national measures outlined in the strategy there are a large number of local measures which are aimed at protecting and enhancing salmon stocks. This application is therefore part of a larger effort aimed at conserving salmon in the River Findhorn.

In common with all rivers in Scotland there are national conservation measures in place to protect vulnerable spring salmon stocks. In relation to salmon conservation, MSS would recommend issuing a licence covering grey and harbour seals during January-March.

Number of seals and feeding activity
The applicant has reported no instances of harbour seals, and six instances of grey seals, in the Findhorn river in the last year.

The applicant has witnessed six predation events by either harbour seals or grey seals in the Findhorn river in the last year.

Interpretation of these numbers is difficult because no information is provided on how they were collected and they are not effort related.

Number of seals requested on the licence
The NERC Special Committee on Seals (SCOS) reports to Scottish Government annually on Potential Biological Removal (PBR) numbers for the two resident seal species. These numbers represent the maximum anthropogenic take from the seal populations within a seal management area in order for the populations to be sustainable, and reflect both the population size and trend. Takes from shooting must be cumulated and assessed alongside all other anthropogenic takes of seals within the management area, including, for example, bycatch and collision with tidal turbines. We note that seals taken through bycatch and other incidental takes are not planned and are

therefore difficult to cumulate for annual assessment. Bycatch data from previous years are also not produced at the same spatial scale as the seal management areas making their inclusion in considerations more complicated. As a result, MSS recommend that MS-LOT take a cautious approach to determining the number of licences for seal takes that can be issued.

The PBR limits advised by SCOS (2021) for seals in this seal management area are 370 for grey seal and six for harbour seal. To our knowledge, there are no other planned anthropogenic takes from the seal populations in this seal management area.

The applicant has requested licences to take nine grey seals and one harbour seal. The total requested seals from all applications in the Moray Firth seal management area in 2022 is 30 grey seals and eight harbour seal. MSS advise that the requested licences for grey seals fall well within the PBR limit for the seal management area both individually and cumulatively. However, the declining harbour seal population in this seal management area, and the correspondingly small PBR mean that there is limited capacity for to account for any bycatch or other incidental take from the harbour seal population. This leads MSS to recommend that no licences should be granted for harbour seals in this seal management area.

Non-lethal deterrents
The applicant has provided evidence on the use of alternative non-lethal techniques to reduce seal predation. Harassment techniques have been used, namely firing blank shots overhead, walking towards hauled out seals and shouting, but seals have become accustomed to this behaviour and only moved a short distance. ADDs, which were previously used 10 years ago, were ineffective.

MSS recommend that prior to lethal removal, applicants explore further non-lethal measures to reduce depredation or displace seals from critical areas of the river. These non-lethal measures have been extensively reviewed in a recent Marine Scotland report (Thompson et al. 2021).

References

Thompson, D, A J Coram, R N Harris and C E Sparling. (2021). Review of non-lethal seal control options to limit seal predation on salmonids in rivers and at finfish farms. Scottish Marine and Freshwater Science Vol 12 No 6, 136pp. DOI: 10.7489/12369-1
https://data.marine.gov.scot/dataset/review-non-lethal-seal-control-options-limit-seal-predation-salmonids-rivers-and-finfish-0

Hopefully these comments are helpful to you. If you wish to discuss any matters further then please contact the REEA Advice inbox at MSS_Advice@gov.scot

Yours sincerely,

Renewable Energy Environmental Advice
Salmon and Freshwater Fisheries
Marine Scotland Science

NatureScot
Scotland's Nature Agency
Buidheann Nàdair na h-Alba

[redacted]
Marine Licencing Officer,
Marine Scotland – Marine Planning & Policy

22 March 2022

By email

Our ref: A3687244

Dear [redacted]

2022 Seal Licence Consultation – Applications for a licence authorising the killing or taking of seals to conserve seals or other wild animals (including birds) or wild plants in Scotland

Thank you for consulting us on this year's seal licensing applications (Table 1). These constitute the second year of applications following the amendment to the Marine (Scotland) Act 2010, and the first following Marine Scotland's updated guidance.

Overarching considerations

The number of Atlantic salmon returning to Scottish coastal waters have declined since the 1970s[1], and the estimated number of spawning salmon has declined from 2010[1]. There are a number of potential factors driving the decline throughout the lifecycle, *i.e.* within the river system and the open seas. These factors include; climate change (especially water temperature), marine development, water quality, in-stream barriers to movement, overfishing, exploitation, and predation. Predators include otter, piscivorous birds, other fish, cetaceans, as well as both seal species (harbour and grey).

River Status- Salmon Grade

Scottish Government assess the conservation status of salmon on a river-by-river basis[2] annually. Conservation status is defined by the probability of stock meeting its egg deposition target over a five-year period. The assessment result in a grading award of 1, 2 or 3 to each river.

[1] https://www.gov.scot/publications/scottish-wild-salmon-strategy/
https://www.gov.scot/publications/salmon-fishery-statistics-2020/

[2] https://www.gov.scot/publications/salmon-fishing-proposed-river-gradings-for-2022-season/

Table 1 - Seal Licence applications for 2022

Seal Management Areas	Applicant	River Grading	MPA consent	Licence recommendation	Page
Southwest Scotland	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
West Scotland	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Western Isles	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Orkney & North Coast	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Moray Firth	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	MF01 – River Findhorn	1	No	Reject[1]	13
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
East Scotland	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

[1]*reject on the grounds of Grade 1 conservation status*
[2]*reject on the grounds that the case for salmon conservation has not been made due to seal presence being 'rare' or 'on occasion'*
[3]*reject for harbour seals, but possible permit for grey seals*
[4]*please see our concerns due to the proximity to the Ythan designated seal haul out*
[5]*Possible permit for both harbour and grey seals*

- **Grade 1** – reflects the probability of at least 80% of stock meeting its egg deposition target over a five-year period - suggests exploitation is sustainable – **Good conservation status**,
- **Grade 2** – reflects the probability of between 60- 80% of stock meeting its egg deposition target over a five-year period - suggesting management action is needed to reduce exploitation - **Moderate conservative status**, and,

- **Grade 3** – reflects the probability at less than 60% of stock meeting its egg deposition target over a five-year period suggesting that exploitation is unsustainable – **Poor conservation status**.

NatureScot Overarching Advice

For the purposes of seal licencing, we remain of the view that although these gradings relate to sustainable exploitation, a grade 1 suggests the salmon stock in that river/area is in good health. The assessment is based on the salmon stock numbers, and therefore exploitation is related to both anthropogenic and natural removal.

Our advice therefore is that there is no case for lethal removal of seals in Grade 1 Rivers.

In any consideration of lethal removal of seals for the purposes of salmon conservation, we also feel it is relevant to highlight emerging evidence[3] that the catching of salmon causes stress and damage to the individual, potentially affecting fitness, and suggest that further restrictions on catch and release may therefore merit consideration. Notwithstanding this, for Grades 2 and 3, our consideration is whether the lethal removal requested will make a material difference to the conservation status of the salmon and/or the conservation status of either seal species.

The numbers of seal take requested are considered with regard to the regional Potential Biological Removal (PBR) values (Table 2) for the Seal Management Area (SMA) concerned. PBR values are calculated annually by the Sea Mammal Research Unit, and reflect a calculation as to how many animals may be removed from a population. **Our view is that, under this licensable purpose, it is not enough for the requested take to be below the seal PBR, the evidence needs to show that lethal removal is necessary for salmon conservation.**

Consistent with advice provided by NatureScot last year, we recommend that all licences for Grade 1 Rivers should be rejected because the stock is classed as being at a good conservation status, and therefore the lethal removal of seals is not necessary for the conservation of salmon.

We also remain of the view that licences for the lethal removal of harbour seals in the East coast and Orkney and north coast management areas are rejected due to the continued population decline of this species in these areas.

Where licensing is deemed appropriate by MSLOT, we recommend that each method statement should specifically detail the non-lethal methods deployed including methods, duration and

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[3] Lennox, R.J., Cooke, S.J., Diserud, O.H., Havn, T.B., Johansen, M.R., Thorstad, E.B., Whoriskey, F.G., Uglem, I., 2016. Use of simulation approaches to evaluate the consequences of catch-and-release angling on the migration behaviour of adult Atlantic salmon (*Salmo salar*). *Ecol. Model.,* 333, 43–50. http://dx.doi.org/10.1016/j.ecolmodel.2016.04.010

Lennox, R.J., Uglem, I., Cooke, S.J., Naesje, T.R., Whoriskey, F.G., Havn, T.B., Ulvan, E.M., Solem, O., Thorstad, E.B., 2015. Does catch-and-release angling alter the behavior and fate of adult Atlantic salmon during upriver migration? *Transactions of the American Fisheries Society*, **144**, 400–409. https://doi.org/10.1080/00028487.2014.1001041

Travis E. Van Leeuwen, J. Brian Dempson, Chantelle M. Burke, Nicholas I. Kelly, Martha J. Robertson, Robert J. Lennox, Torgeir B. Havn, Martin Svenning, Ross Hinks, Matthew M. Guzzo, Eva B. Thorstad, Craig F. Purchase, and Amanda E. Bates. Mortality of Atlantic salmon after catch and release angling: assessment of a recreational Atlantic salmon fishery in a changing climate. *Canadian Journal of Fisheries and Aquatic Sciences*. **77**(9): 1518-1528. https://doi.org/10.1139/cjfas-2019-0400)

recording of methods used, it should also provide details of any Acoustic Deterrent Device (ADD) use.

Table 2 - Seal Licence applications for 2022, together with the regional Potential Biological Removal (PBR) figures

Seal Management Areas	Regional PBR for 2021[4] (draft 2022)[5]		Applicant	Requested take	
	Harbour seal	Grey seal		Harbour seal	Grey seal
Southwest Scotland	71 (71)	116 (119)	[redacted]	[redacted]	[redacted]
			[redacted]	[redacted]	[redacted]
West Scotland	936 (936)	933 (966)	[redacted]	[redacted]	[redacted]
			[redacted]	[redacted]	[redacted]
			[redacted]	[redacted]	[redacted]
Western Isles	105(105)	1291 (1336)	[redacted]	[redacted]	[redacted]
			[redacted]	[redacted]	[redacted]
Orkney & North Coast			[redacted]	[redacted]	[redacted]
			[redacted]	[redacted]	[redacted]
Moray Firth	6 (6)	370 (383)	[redacted]	[redacted]	[redacted]
			[redacted]	[redacted]	[redacted]
			MF01 – River Findhorn	1	9
			[redacted]	[redacted]	[redacted]
			[redacted]	[redacted]	[redacted]
			[redacted]	[redacted]	[redacted]
			[redacted]	[redacted]	[redacted]
East Scotland	2 (2)	823 (852)	[redacted]	[redacted]	[redacted]
			[redacted]	[redacted]	[redacted]
			[redacted]	[redacted]	[redacted]

Where MS LOT determine a licence could be granted for grey seals and not harbour seals (e.g. Moray Firth) correct species identification will be of the utmost importance.

Where lethal removal is licenced, we suggest that recent evidence[6] of the physiological and other impacts associated with the catch and release of Atlantic salmon should be reviewed, and

[4] https://www.gov.scot/publications/marine-licensing-map-of-seal-management-areas-and-provisional-pbr/
[5] Draft SCOS 2021 (unpublished)
[6] Travis E. Van Leeuwen, J. Brian Dempson, Chantelle M. Burke, Nicholas I. Kelly, Martha J. Robertson, Robert J. Lennox, Torgeir B. Havn, Martin Svenning, Ross Hinks, Matthew M. Guzzo, Eva B. Thorstad, Craig F. Purchase, and Amanda E. Bates. 2020. Mortality of Atlantic salmon after catch and release angling: assessment of a recreational Atlantic salmon fishery in a changing climate. *Canadian Journal of Fisheries and Aquatic Sciences*. **77**(9): 1518-1528. https://doi.org/10.1139/cjfas-2019-0400

consideration given to the need for further measures or regulation on the catching of salmon in those rivers. The potential impacts associated with catch and release of salmon are not mentioned in any of the applications and perhaps should be, as the aim here is the conservation of Atlantic salmon.

We consider that the assessment of seal predation in rivers should be based on the number of seals that can be clearly identified as taking salmon, and not on the number of seals observed in the area, because not all seals present in the river are 'salmon/river specialists'. In addition, whilst some seals may have a direct impact on salmon through feeding, fisheries also include the indirect impact on their fishery by affecting the rod activity. Our view is that seal shooting should only be used as a last resort where all appropriate non-destructive alternatives have been exhausted. **We wish to see greater demonstration that there is no satisfactory alternative way to mitigate seal predation/damage on salmon.**

Both harbour and grey seals are protected species. We have therefore considered each location's connectivity to Seal SACs, together with any overlap with Seal Designated haul-outs. Where a licence location is within 20km of a grey seal SAC, or 50km of a harbour seal SAC, we offer advice on HRA.

The lethal removal of individual seals has obvious welfare issues for the seal. The licence requires that the shooting is undertaken by a suitably qualified named person. Although the retrieval of the carcass is not often done, we strongly recommend that there should be greater effort to comply with this recommendation should licences be approved.

The shot seal should be retrieved and either taken to Scottish Marine Animal Stranding Scheme (SMASS)[7], or retrieved by SMASS so that a necropsy can be undertaken. We would welcome further discussion regarding compliance monitoring with yourselves in connection with species identification and numbers of seals actually shot.

In the annex to this letter we provide advice for all applications, and a consent response under section116 (2) of the Marine (Scotland) Act 2010, for those applications where shooting is proposed within a protected area.

General comments on quality of licence applications

Whilst the quality of applications is much improved from last year, the evidence supplied to support the lethal removal on the conservation of salmon is still weak. The argument put forward by the applicants is that any seal seen in the area will be predating on salmon, and any adult salmon removed from the population, or damaged will have an impact on the number of eggs laid. Whilst we agree with this in general terms, it is difficult to evidence how the removal of seals will

Magdalene Papatheodoulou, Libor Závorka, Barbara Koeck, Neil B. Metcalfe, and Shaun S. Killen. 2021. Simulated pre-spawning catch and release of wild Atlantic salmon (*Salmo salar*) results in faster fungal spread and opposing effects on female and male proxies of fecundity. *Canadian Journal of Fisheries and Aquatic Sciences*. **79**(2): 267-276. https://doi.org/10.1139/cjfas-2021-0089

[7] https://strandings.org/

result in a significant benefit to salmon numbers, in the context of all other variables relating to in river salmon stock and therefore improve conservation status.

Covid was highlighted as a reason why there was a lack of recorded observations of seals in the rivers applied for. However, there was also mention of an app. under development by the Scottish Fisheries Coordination Centre that should provide more formal data in the future.

The locational detail supplied this year was very useful for our considerations.

Non-lethal methods sections were completed in all cases. Our view on these methods identified is as follows.

- *Barriers*

Some applicants misunderstood this section and detailed what barriers were or were not within the particular stretch of river, rather than implementing a barrier to restrict seals from key locations. Most put forward the argument that the introduction of barriers in order to keep seals out of the area would be counterproductive, in that they would hinder passage of the fish, and that they would catch river debris and further impede flow. We agree with this general assessment.

- *Harassment*

All applicants stated that general harassment methods would be tried before shooting of a seal occurred. Methods suggested included, human presence, shouting, clapping of hands, paint ball guns and shooting in the air. Many put forward the view that these do not work well because seals in the area generally habituate to such methods. We tend to agree, but maintain all methods should still be tried, and that applicants should also consider new suggestions arising in the future.

- *Translocation*

All stated that capture and translocation of seals does not work. They highlighted the difficulty in capturing the seal - specifically, that they did not have trained personnel to enable capture, and that most translocated seals generally come back to the area once released. We agree that translocation is currently not practical and can add stress to individual animals.

- *ADDs*

Many highlighted that the efficacy of ADDs is equivocal. Many said the river substrate meant that the noise would not propagate effectively. Some noted that ADDs could not be used as there was not mains power available at the stretch of river under consideration. This is incorrect; ADDs can be operated on a battery. It was unclear in many instances the level of understanding there is of the practical implementation of ADD. We would not advise on the continuous operating of ADD, instead, an ADD should be used to target particular times of greatest risk. Many made the point that the greater risk of seal predation is when the water level is low, therefore it is possible that an ADD could be targeted at the greater risk period when a seal is present in the area. ADD development is ongoing and so this option should not be automatically discounted.

Some note the potential for disturbance to non-target species, e.g. cetaceans. Whilst this is true in many circumstances, there is a low likelihood in the river environment under consideration here. In the event that disturbance was the case, we would balance the risk of temporary disturbance of protected cetaceans, against the lethal removal of protected seals.

We trust these comments are useful, but please contact [redacted] if you wish to discuss our comments further.

Yours sincerely

[redacted]

[redacted]
Head of Sustainable Coasts & Seas

ANNEX: Advice - by seal management unit and applicant

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

MPA	Protected Features	Does the lethal removal of seals by shooting have any negative impact on these sites conservation objectives
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

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MPA	Protected Features	Does the lethal removal of seals by shooting have any negative impact on these sites conservation objectives
[redacted]	[redacted]	[redacted]

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[redacted]

[redacted]

MPA	Protected Features	Does the lethal removal of seals by shooting have any negative impact on these sites conservation objectives
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

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[8] Thompson D., Duck C.D., Morris C.D., Russell D.J.F. (2018). The status of harbour seals (*Phoca vitulina)* in the UK. *Aquatic Conservation Marine Freshwater Ecosystems,* **29**(1), 40-60.
[9] Arso Civil, M., Smout, S.C., Duck, C., Morris, C., Cummings, C., Langley, I., Law, A., Morton, C., Brownlow, A., Davison, N., Doeschate, M., Lacaze, J-P., McConnell, B., Hall, A.J. (2018). *Harbour Seal Decline – vital rates and drivers.* Report to Scottish Government HSD2. https://marine.gov.scot/sma/content/harbour-seal-decline-vital-rates-and-drivers-report-scottish-government-hsd2

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

MPA	Protected Features	Does the lethal removal of seals by shooting have any negative impact on these sites conservation objectives
[redacted]	[redacted]	[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

MORAY FIRTH

Total lethal removal requested for this seal management unit is **8 harbour seals and 30 grey seals**. The PBR (Table 2) for this area for harbour seals is 6.

The population of harbour seals in the Moray Firth declined at a rate of 5.6% p.a. between 1994 and 2000, followed by a step change with a drop of ~ 28% occurring between 2000 and 2003, with

no significant trend thereafter[10]. There is no evidence of a continued decline, but neither is there any sign of recovery[11]. The Moray Firth SMA is also a harbour seal Conservation Area, as designated under the Marine (Scotland) Act 2010. The majority of harbour seals are observed between Culbin and Findhorn. The harbour seal population in the Dornoch Firth and Morrich More SAC are currently classed as declining. All applications, bar the [redacted] and the [redacted] are within the 50km connectivity buffer for the Dornoch Firth and Morrich More SAC. Any permitted shooting would therefore trigger Likely Significant Effect, and an appropriate assessment would need to be undertaken.

The grey seal population on the east coast in Scottish waters is still increasing, but at a much smaller rate than those populations on the east coast in English waters.

We therefore recommend that licences for the lethal removal of harbour seals in the East Coast Management Area are rejected due to the continued population decline of this species in these areas.

- [redacted]

[redacted]

- [redacted]

[redacted]

[10] Thompson D., Duck C.D., Morris C.D., Russell D.J.F. (2018). The status of harbour seals (*Phoca vitulina)* in the UK. *Aquatic Conservation Marine Freshwater Ecosystems,* **29**(1), 40-60.
[11] http://www.smru.st-andrews.ac.uk/scos/scos-reports/

[redacted]

- **MF01 – River Findhorn**

NatureScot Consent assessment

The River Findhorn overlaps with the following MPAs (Table 7). Some protected features connected to the river location are susceptible to disturbance (see Moray and Nairn Coast Ramsar site and Moray and Nairn Coast SPA). Therefore, the lethal removal of **one harbour seal and nine grey seals** may have an adverse impact on the conservation objectives for these sites.

Table 7 - River Findhorn overlapping protected sites

MPA	Protected Features	Does the lethal removal of seals by shooting have any negative impact on these sites conservation objectives
Lower Findhorn Woods SAC	Mixed woodland on base-rich soils associated with rocky slopes	No
Lower Findhorn Woods SSSI	Bryophyte assemblage; lichen assemblage; oligotrophic rive/stream; upland mixed ash woodland; upland oak woodland; wet woodland	No
Moray and Nairn Coast Ramsar site	Greylag goose; intertidal mudflats and sandflats; pink footed goose; redshank; saltmarsh; sand dunes; wet woodland; shingle; waterfowl assemblage	Disturbance to greylag goose (declining)
Moray and Nairn Coast SPA	Bar-tailed godwit; Dunlin; Greylag goose; osprey; oystercatcher; pink-footed goose; red-breasted merganser; Redshank; waterfowl assemblage; wigon	Disturbance to all species, particularly declining – water fowl; redshank; pinkfooted goose; greylag goose; bar-tailed godwit
Culbin Sands, Culbin Forest and Findhorn Bay SSSI	Coastal geopmorphology of Scotland; fungi assemblage; hydromorphological mire range; invertebrate assemblage;lichen assemblage; mesotrophic loch; saltmarsh; sand dunes; shingle; vascular plant assemblage	No

Licence recommendation

The River Findhorn is a grade 1 river and therefore our advice is that this application **should be rejected because the stock is classed as being at a good conservation status, and therefore the lethal removal of a few individual seals is not necessary for the conservation of salmon.**

- [redacted]

[redacted]

[redacted]

[redacted]

MPA	Protected Features	Does the lethal removal of seals by shooting have any negative impact on these sites conservation objectives
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

[redacted]

[redacted]

- [redacted]

[redacted]

[redacted]

[redacted]

MPA	Protected Features	Does the lethal removal of seals by shooting have any negative impact on these sites conservation objectives
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

[redacted]

[redacted]

- [redacted]

[redacted]

[redacted]

[redacted]

MPA	Protected Features	Does the lethal removal of seals by shooting have any negative impact on these sites conservation objectives
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted] (unfavourable declining)

[redacted]

[redacted]

- [redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted].

EAST SCOTLAND

[redacted]

[redacted] [redacted]

[redacted]

[redacted]

[redacted]

MPA	Protected feature	Does the lethal removal of seals by shooting have any negative impact on these sites' conservation objectives
[redacted]	[redacted]	[redacted]

[12] Thompson D., Duck C.D., Morris C.D., Russell D.J.F. (2018). The status of harbour seals (*Phoca vitulina)* in the UK. *Aquatic Conservation Marine Freshwater Ecosystems,* **29**(1), 40-60.

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[redacted]

[redacted]

[redacted]

- [redacted]

[redacted]

[redacted]

[redacted]

MPA	Protected Features	Does the lethal removal of seals by shooting have any negative impact on these sites conservation objectives
[redacted]	[redacted]	[redacted]

[redacted]

[redacted]

[redacted]

Comments on Applications for Licences to shoot seals in 2022 provided by the Sea Mammal Research Unit, Scottish Oceans Institute, University of St Andrews.

Potential Biological Removal (PBR) values for 2022

The PBR includes all forms of anthropogenic mortality. There is some bycatch of seals of both species in North Sea fisheries and elsewhere, the level of which is unknown.

Table 1. Potential Biological Removal (PBR) values for grey seals in Scotland by Seal Management Unit for the year 2022.

	2016-2019		PBRs based on recovery factors F_R ranging from 0.1 to 1.0										selected	
Seal Management Area	count	N_{min}	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	F_R	PBR
1 Southwest Scotland	517	1,927.0	12	23	35	46	58	69	81	92	104	116	1.0	116
2 West Scotland	4,174	15,554	93	187	280	373	467	560	653	747	840	933	1.0	933
2a West Scotland - Sou	2,922	10,888												653
2b West Scotland - Cer	773	2,880												173
2c West Scotland - Nor	479	1,785												107
3 Western Isles	5,773	21,512	129	258	387	516	645	774	904	1,033	1,162	1,291	1.0	1,291
4 North Coast & Orkney	8,599	32,043	192	385	577	769	961	1,154	1,346	1,538	1,730	1,923	1.0	1,923
4a North Coast	414	1,543												93
4b Orkney	8,185	30,500												1,830
5 Shetland	1,009	3,760	23	45	68	90	113	135	158	180	203	226	1.0	226
6 Moray Firth	1,657	6,175	37	74	111	148	185	222	259	296	333	370	1.0	370
7 East Scotland	3,683	13,724	82	165	247	329	412	494	576	659	741	823	1.0	823
SCOTLAND TOTAL	25,412	94,695	568	1,137	1,705	2,271	2,841	3,408	3,977	4,545	5,113	5,682		5,682

$PBR = N_{min} \ (R_{max}/2) \ F_R$

where: **PBR** is a number of animals considered safely removable from the population.

N_{min} is a minimum population estimate. A revised analysis of GPS/GSM telemetry data from 60 grey seals, tagged between 2005 and 2018, allowed more accurate identification of haulout times (SCOS-BP 21/02). The revised estimate of proportion of seals hauled out during the survey window was 25.2% (95% CI: 21.5 – 29.1%), compared with the previous estimate of 23.9% (95% CI: 19.2 - 28.6%) (SCOS-BP 16/03). The 20th centile of the distribution of scalars from counts to abundances derived from the revised estimate is 3.73, approximately 3.5% lower than the previous scalar (3.86).

R_{max} is the population growth rate at low densities (by default set 0.12 for pinnipeds), this is halved to give an estimate of the growth rate at higher populations. This estimate should be conservative for most populations at their OSP.

Table 2. Potential Biological Removal (PBR) values for harbour seals in Scotland by Seal Management Unit for the year 2022.

	2016-2019		PBRs based on recovery factors F_R ranging from 0.1 to 1.0										selected	
Seal Management Area	count	N_{min}	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	F_R	PBR
1 Southwest Scotland	1,709	1,709	10	20	30	41	51	61	71	82	92	102	0.7	71
2 West Scotland	15,600	15,600	93	187	280	374	468	561	655	748	842	936	1.0	936
2a West Scotland - Sou	7,069	7,069												424
2b West Scotland - Cer	7,447	7,447												447
2c West Scotland - Nor	1,084	1,084												65
3 Western Isles	3,532	3,532	21	42	63	84	105	127	148	169	190	211	0.5	105
4 North Coast & Orkney	1,405	1,405	8	16	25	33	42	50	59	67	75	84	0.1	8
4a North Coast	109	109												1
4b Orkney	1,296	1,296												7
5 Shetland	3,180	3,180	19	38	57	76	95	114	133	152	171	190	0.1	19
6 Moray Firth	1,077	1,077	6	12	19	25	32	38	45	51	58	64	0.1	6
7 East Scotland	343	343	2	4	6	8	10	12	14	16	18	20	0.1	2
SCOTLAND TOTAL	26,846	26,846	159	319	480	641	803	963	1,125	1,285	1,446	1,607		1,147

$PBR = N_{min} \ (R_{max}/2) \ F_R$

where: **PBR** is a number of animals considered safely removable from the population.

N_{min} is a minimum population estimate (counts were used directly as values for N_{min}).

R_{max} is the population growth rate at low densities (by default set 0.12 for pinnipeds), this is halved to give an estimate of the growth rate at higher populations. This estimate should be conservative for most populations at their Optimum Sustainable Population (OSP).

F_R is a recovery factor, usually in the range 0.1 to 1. Low recovery factors give some protection from stochastic effects and overestimation of the other parameters. They also increase the expected equilibrium population size under the PBR.

Total number of animals requested by Seal Management Areas

The total numbers of grey seals requested by Seal Management Area are well below the PBR for these SMAs. This is also true for harbour seals in the three SMAs in western Scotland. However, in North Coast & Orkney, Moray Firth, and East Scotland the number of harbour seals requested are either higher than, equal to, or only slightly lower than the PBR values.

Table 3. Summary of the number of animals requested by applicant and by Seal Management Area (SMA), compared to the PBR values for each SMA. The yellow cells highlight values that are close to or above the PBR.

		No. of	Requested		PBR		
Seal Management Area	Applicant	rivers	Hg	Pv	Hg	Pv	
Southwest Scotland	SW02	1	1	1			
Southwest Scotland	SW06	1	2	1			
Southwest Scotland			**3**	**2**	**116**	**71**	
West Scotland	WS05	3	6	3			
West Scotland			**6**	**3**	**933**	**936**	*
Western Isles	WI18	1	5	0			
Western Isles	WI28	1	6	0			
Western Isles			**11**	**0**	**1,291**	**105**	
North Coast & Orkney	ONC05	1	4	2			
North Coast & Orkney	ONC08	1	1	1			
North Coast & Orkney			**5**	**3**	**1,923**	**8**	*
Moray Firth	MF01	7	30	8			
Moray Firth			**30**	**8**	**370**	**6**	
East Scotland	EC06	1	5	1			
East Scotland	EC07	1	6	0			
East Scotland	EC23	1	3	1			
East Scotland			**14**	**2**	**823**	**2**	
TOTAL			**69**	**18**			

* Split up by SMA subdivision (based on the proportions of the most recent count) the PBRs for West Scotland – South are: 653Hg & 424Pv, for North Coast they are: 93Hg & 1Pv.

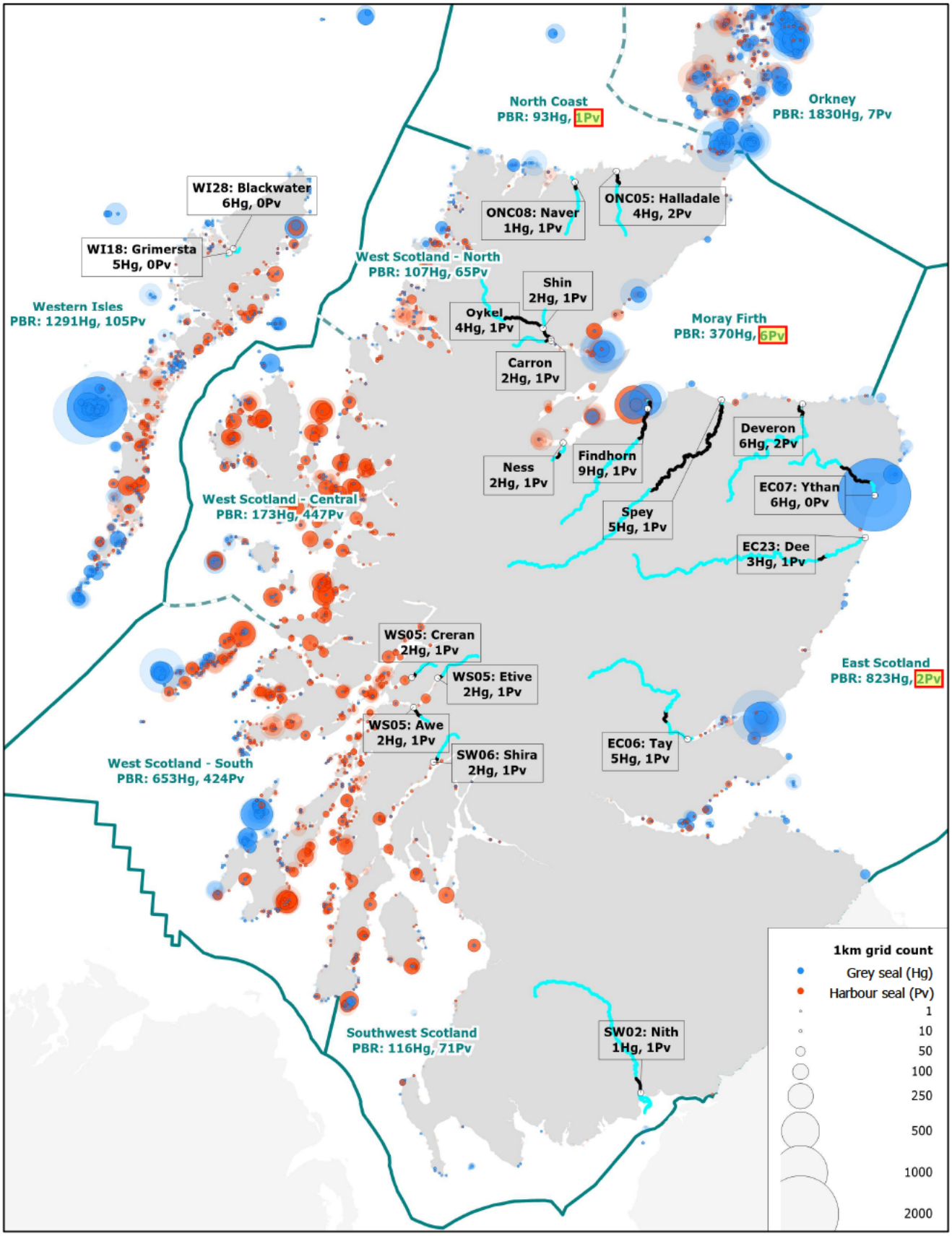


Figure 1. Text boxes indicate applicant (except for Moray Firth where all MF01), river name, and number of animals requested. The PBRs for each Seal Management Area (SMA) are shown with the SMA labels (PBRs for West Scotland and North Coast & Orkney are split up by subdivisions to reflect the proportion of animals counted in each subdivision). The low PBR values for the North Coast and the two eastern SMAs are highlighted. Seal counts from five full censuses are also shown, with the most recent counts (2016-2019) displayed more prominently on top of the older counts.

Individual applicants

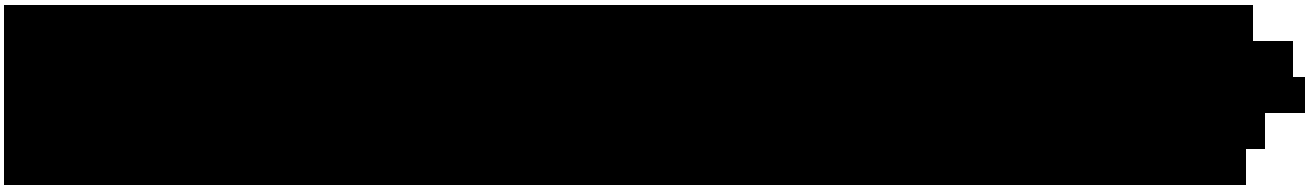
The following tables summarise the number of animals requested by each applicant together with the totals for the given SMA (subdivision) and the relevant PBR values. For comparison, the equivalent numbers for the five previous licence periods are also provided, as well as the number of animals granted and shot in those licence periods. Where the number requested is close to the PBR for the SMA (subdivision) the relevant cells are highlighted in yellow. Additional comments may be added to highlight further points of interest.

Southwest Scotland

West Scotland

Western Isles

North Coast & Orkney



Moray Firth

Seal Management Area:	Moray Firth											
Applicant:	MF01 Moray Firth Seal Management Group											
	Grey seals						Harbour seals					
River(s) Grade	2017	2018	2019	2020	2021	**2022**	2017	2018	2019	2020	2021	**2022**
[redacted]												
River Findhorn 1						9						1
[redacted]												
Applied for	40	40	40	40	40	**30**	6	6	6	6	1	**8**
Granted	18	18	18	18	0	-	0	0	0	0	0	-
Shot	15	18	18	13	0	-	0	0	0	0	0	-
SMA Moray Firth												
No. of applicants	1	1	1	1	1	1	1	1	1	1	1	1
Applied for	40	40	40	40	40	**30**	6	6	6	6	1	**8**
Granted	18	18	18	18	0	-	0	0	0	0	0	-
Shot	15	18	18	13	0	-	0	0	0	0	0	-
PBR	294	289	275	178	383	**370**	4	5	5	5	6	**6**
Most recent count	1,917	1,252	1,189	769	1,657	**1,657**	745	940	879	962	1,077	**1,077**
Years counted	(2008; 2011; 2013; 2015)	(2008; 2011; 2016)	(2008; 2011; 2016; 2017)	(2008; 2011; 2016; 2018)	(2016; 2019)	**(2016; 2019)**	(2008; 2011; 2013; 2015)	(2008; 2011; 2016)	(2008; 2011; 2016; 2017)	(2008; 2011; 2016; 2018)	(2016; 2019)	**(2016; 2019)**
Trend	Stable						Stable					

This applicant has decreased the total number of grey seals in this year's applications, but increased the total number of harbour seals requested. This increase may be because, in previous years, multiple rivers were covered by a single licence, and the number of animals granted on a licence could be shot wherever deemed necessary by the applicant. With the new licensing system, each licence covers only one river, which means that the total numbers requested by an applicant are likely to rise in order to allow shooting at least one animal at each river location if required.
The harbour seal PBR for the Moray Firth SMA is set at 6 and is lower than the number of harbour seals requested.

East Coast

[redacted]

General notes

Identification of seals

It is important that the Applicant is able to differentiate the two species of seal with confidence, especially given the state of the harbour seal population on the east coast and in the Northern Isles of Scotland.

Photographs should be taken of seals thought to be feeding on salmon, in order to identify specialist individuals that repeatedly return to a river to predate on salmon. Only once a specialist seal has been identified and no other methods are successful in deterring this individual should the applicant consider making use of a licence to kill a seal.

Carcass recovery

Every effort should be made to recover the carcasses of any seals that have been shot. Fresh carcasses can provide valuable data on diet, condition, and life history parameters. Please contact either SMRU or the Scottish Marine Animal Stranding Scheme at the University of Glasgow.