



**Date:** 8 December 2016  
**To:** Guy Kerrison  
**CC:** Sarah McRae; Jane Gunn  
**From:** Graeme Taylor, Principal Science Advisor, Marine Species and Threats

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**Subject: Comments on the NIWA seabird reports assessing issues with relocation of salmon farms in Marlborough**

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## Introduction

As part of the Marlborough Initiative – New Zealand King Salmon, the Ministry of Primary Industries has led an assessment of the environmental impacts of existing salmon farms in the Marlborough region. Amongst a range of options available to improve best practise with marine farming is a proposal to relocate up to six salmon farms from low flow sites to potential new sites in higher flow areas. The Ministry for Primary Industries (MPI) commissioned NIWA to undertake a review of the potential impacts of any salmon farm relocations on seabird species. The Department of Conservation was asked to comment on the NIWA report at various draft stages. This memo provides a record of the comments made during the peer review process.

### Initial Draft (29/07/16)

I read through David Thompson's report. I think it provides a reasonable assessment of the risks to King Shags from the proposed changes to the marine farm locations and the positioning of new farms. David is correct in concluding that the king shags mostly forage within a fixed range of their breeding and roosting sites. They are known to feed over relatively shallow water (<50m in depth) and past research has shown they avoid areas directly within marine farms when foraging. The area of available foraging habitat in the outer sounds is quite substantial. Whether king shag populations are limited in abundance by available food resources or some other factors is debateable. They mainly feed on fish species that live on the sea bed such as flatfish and juvenile fish species. The population trends of these fish species are likely to be informative as to what is happening to one of their top predators.

Shifting marine farms is contentious but if the new ones are positioned no closer to existing breeding sites I don't see that being an issue. Locating new farms over deep water should mitigate impacts on the shags as they are not able to access prey species in deep water.

Whether currents will spread the area of nutrient enriched water and detritus that might affect fish stocks is one uncertainty, especially with positioning farms in areas of greater current flow.

I spotted just one error in the report. It refers to the king shag census photos being taken from a helicopter. In fact they were gathered from a fixed wing aircraft.

### **Revised draft 1 (30/08/16)**

I have read through the document again. Just one error I pointed out last time that has not been fixed and a few typos were spotted. No real concerns with this review done by David Thompson. I agree with his conclusions. At some stage it would be useful to do some GPS tracking of this species to get more accurate movement data but the current review of published literature is a fair appraisal of the risks to king shags.

### **Revised draft 2 (05/09/16)**

I had a read through the revised document. I agree that the impact of noise on the shags is likely to be minimal. Clearly sudden and loud noises generated by mechanical processes have the likelihood of startling wildlife. But if these noises sources become a regular part of the background noise in the area, the birds are likely to habituate to these sounds over time.

Likewise, while the detritus from the farms will have some consequence on the local environment near the marine farms, the information presented elsewhere in the report has shown evidence that these farms do not represent preferred foraging habitat for the shags. Therefore local effects on the marine environment should not have undue consequences on the shag foraging behaviour. It is really a factor of scale. If the farms cover only a small part of the total foraging habitat for this species, then the shags have plenty of alternative places to source food. If the number of farms and size of these farms increases over time, then at some stage they will begin to affect the foraging space available for the shags the Marlborough region.

### **Comments on the peer review process**

In reviewing the draft seabird texts sent to me, I was not asked to consider the wider issues associated with other types of marine farming in the region, or other threats to seabirds that might influence this assessment. Nor was I given a copy of the consultation documents or the summary of other environmental effects for the proposed marine farming changes. Therefore, my assessment of the NIWA report did not consider:

- cumulative effects – effects of aquaculture in general, and other non-aquaculture pressures on seabird populations (e.g. fisheries bycatch, human disturbance of nesting colonies or roost sites, other forms of development in the area such as forestry or impacts of predators on colonies); or
- the indirect effects of the salmon farms on water quality issues in the wider Marlborough Sounds region if high flow currents disperse nutrients well beyond the area of the marine farms. This potentially could change the availability of seabird food sources beyond the marine farming areas either positively or negatively depending on the how nutrients influence food chains. These issues may be covered in separate reports commissioned by MPI.

## **Other risks to seabirds not covered in the NIWA report**

In November 2016, I was given a copy of the full consultation document and the summary assessment of environmental effects of the proposed new marine farm sites to check if any risks or issues were raised in these documents that was not considered in the NIWA seabird assessment. Having checked through these documents I have located one additional issue that could impact on seabirds.

The plans provide information about the use of lights at the marine farms. Salmon farms use underwater lighting to help manage fish stocks during the darker months of the year. These underwater lights will illuminate a large area of the sea surface when viewed from above. There is potential here for light attraction issues with some vulnerable groups of seabirds. The species most likely to be attracted to light sources would include storm petrels, fairy prions and diving petrels. None of these groups are threatened. There are very few storm petrels breeding in the Marlborough Sounds region but there are nationally significant colonies of the other species nesting on islands in the outer Sounds. These seabird species normally forage in the open ocean but can be observed foraging in the outer Sounds. In certain weather conditions, especially periods of sea fog at night, there would be a possibility of light attraction by these species towards the salmon farms, especially those new farms proposed in the outer reaches of the Sounds. The salmon farms have netting surrounding the boundary of the cages to stop seals entering the cages and these nets could result in birds getting snared if attracted to the light sources at night. I don't consider this to be a huge risk to the local populations because the proposed salmon farms are well within the Sounds but some monitoring of this potential impact on small seabirds should be carried out if the farm relocations are approved.

## **Conclusion**

In general, I found no major disagreement with the information provided in the NIWA report. The information was mostly accurate and a fair assessment of the risks from the proposed new marine farms. I agree with the NIWA report that there is still a level of uncertainty about whether the higher flow currents at the new sites will influence changes in water quality over a wider area of the Marlborough Sounds. It remains uncertain how any potential changes in water turbidity or nutrient levels might impact on seabirds or fish stock near the proposed farms. The only omissions I detected in the NIWA report was the lack of a clear statement about the risks of cumulative effects from other threatening processes influencing seabird populations in the Marlborough Sounds. Nor was there any assessment on the risks from marine farm lights on some groups of seabirds.

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