

A Summary of the Impacts of Intervention Activities on the Abundance of Hawaiian Monk Seals¹

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Introduction

The PIFSC Hawaiian Monk Seal Research Program (HMSRP) conducts fieldwork in the main Hawaiian Islands and the Northwestern Hawaiian Islands primarily to monitor the number of monk seals in the population, to track their survival and productivity, and to understand their behavior in a variety of situations. Another benefit of this field work is to allow field staff to directly intervene in cases where risks to monk seals are observed. This report summarizes results from a preliminary analysis to characterize the potential benefits accrued from direct interventions to resolve monk seal survival risks. This analysis is not exhaustive due to data and interpretive limitations, but it develops a characterization of the benefits associated with these past and ongoing fieldwork activities. This is valuable to NMFS because it helps us gauge the contribution of our past efforts to the welfare of the HMS population and may also help us assess how to best focus future work.

The analysis only includes *direct* interventions – that is, those handling interventions that are undertaken to address an immediate survival risk to a particular seal or seals. In contrast, *indirect* interventions that are undertaken to ameliorate potential or dispersed risks (such as removing marine debris, regulating fisheries, controlling access, removing aggressive males or predatory sharks) are not assessed.

Summary of Analysis

The HMSRP identified a number of handling events types that could result in increasing the survival of a seal (e.g. disentangling seals from nets, dehooking, or reuniting mothers and pups). Other types of events such as handling for research purposes were not included. Each handling event was also assigned a numerical severity code to indicate the relative risk (from low risk to near certain mortality) posed by the threat being mitigated by the intervention. The severity codes were defined in the following way:

- 0 No or negative survival benefit
- 1 Possibly improved chance of survival
- 2 Probably improved chance of survival
- 3 Seal would have almost certainly died without action, increased chance of survival

This analysis focused primarily on those interventions that addressed high risk situations (categories “2” or “3”).

Results

¹ This is a summary of NOAA PIFSC internal report IR-12-04 “**A Summary of the Impacts of Intervention Activities on the Abundance of Hawaiian Monk Seals**”

The following is only a summary of some of the results of this analysis. There were a total of 737 survival-enhancing interventions involving 576 individual seals (some seals were involved in more than one incident). These interventions included 614 handling interventions that addressed risks of Severity 2 or greater.. Considering only these high risk interventions, there were 486 permanently identified seals whose status could be monitored throughout their lifespan. Of these handled seals, there are 124 seals currently surviving, including 69 females. Throughout the lifespan of the handled seals (including those still alive as well as those no longer in the population), there were 198 known births, with 56 of those descendents still alive including 25 females. Extending the analysis one additional generation, there were 2 known births born to 2nd generation females, with 1 of those still alive. Combining all 3 generations gives 686 total seals (486+198+2), with 181 (124+56+1) still alive including 94 females.

Because the mother of many of the pups born in the population remains unknown, the preceding results likely underestimate the actual number of seals descended from handled seals. Applying a correction factor to the known pup production², we estimate that there are approximately 256 seals currently in the population which were involved or were descended from handled seals (all severities). If only interventions of severity 2 or greater are considered, this value becomes 204 seals .

Interpretation

Approximately 23% of the current population of 1,125 seals (2011 Stock Assessment report) consists of seals handled to resolve survival risks or their descendants ($256/1125=0.23$). For Severity 2 or greater interventions, approximately 18% of the current population ($204/1125 = 0.1813$) belongs to a lineage of seals that probably or certainly would not be in the population without intervention.

In concert, the presence of HMSRP field staff, their handling interventions, and the reports generated from a thirty-year presence in the NWHI, has provided an important safety buffer (at least 18%) for the population. This is particularly important during a period of stress for the NWHI population and may prove critical to the species in terms of their ability to weather the current storm of declining numbers and low juvenile survival throughout much of their breeding range in the NWHI.

² The derivation of this correction factor is described in NOAA PIFSC internal report IR-12-04