

# Changes in distribution and evidence of population growth of the Hawaiian monk seal in the main Hawaiian Islands based on aerial surveys

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## Abstract

Though Hawaiian monk seals primarily inhabit the Northwestern Hawaiian Islands (NWHI) where the population is well understood and declining, there is a small sub-population of uncertain size in the main Hawaiian Islands (MHI). Increasing numbers of births and reported monk seal sightings suggest a growing MHI population. Because extensive coastlines, low numbers, and funding have impeded MHI population assessment, most information has come from the public and is highly biased by location and effort. Aerial surveys have been used as a tool to estimate abundance and identify trends in the MHI population. Aerial surveys of all MHI coastlines were conducted in 2000, 2001 and 2008, yielding counts of 45, 52, and 85 seals respectively. While these counts do not represent the total MHI population (as not all seals are on the beach at any one time), they do provide an index of abundance and information on the relative distribution of seals. Comparisons between the 2000-2001 surveys and the 2008 surveys suggest an increase in population size and changes in distribution.

In 2000-2001 most seals were seen in the northern part of the MHI at Niihau and Kauai with relatively few seals counted from Oahu south to the island of Hawaii. The 2008 surveys likewise yielded relatively high counts at Niihau and Kauai, but there was also an increase in seals counted at Oahu and Molokai. These numbers are consistent with increases in known births at these islands as well as the number of seals identified on each island from reports made by the general public. The aerial surveys of 2008 also yielded other useful information regarding the assessment of the MHI monk seal population. In addition to providing a minimum population index, these surveys documented the highest MHI count (n=47) on a single island (Niihau) to date, and provided other valuable information including discovery of previously undocumented births (n=8) and identification of parturient females without prior reproductive histories

## Introduction

•Most Hawaiian monk seals inhabit the remote Northwestern Hawaiian Islands (NWHI) (Fig.1)

•There is a small sub-population of uncertain size in the main Hawaiian Islands (MHI) (Fig.1)

•Aerial surveys of the MHI provide an index of abundance and information on the relative distribution of seals

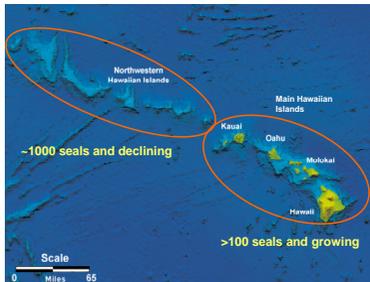


Figure 1. The Hawaiian Archipelago and range of the Hawaiian monk seal. Approximation of the populations of monk seals in the NWHI and MHI for 2008

## Methods

•Aerial surveys of all MHI coastlines were conducted in 2000, 2001 and 2008 by NMFS personnel

•All surveys were conducted during the summer and fall months

•Surveys were conducted from a fixed wing, twin engine aircraft (2000), Hughes 500 helicopter (2001,2008) and USCG Dolphin helicopter (2008)



## Results

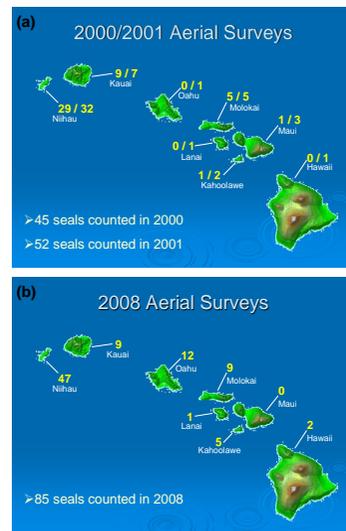


Figure 2. The distribution of monk seals seen during the 2000/2001 (a) and the 2008 (b) aerial surveys

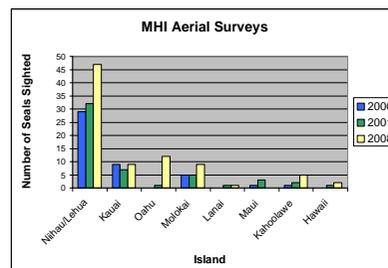


Figure 3. Comparison of the number of seals seen at each island for the 2000, 2001 and 2008 aerial surveys

## Results

•More seals are consistently seen at Niihau than at any other MHI

•2008 Niihau survey yielded the highest single day count (n=47) on any MHI to date

•Notable increase in seals counted at Oahu and Molokai in 2008

•Islands of Lanai, Maui, Kahoolawe and Hawaii had relatively low counts for all years

•General trend of a decrease in the number of seals counted from northwest to southeast

•In 2000 and 2001 most seals were seen in relatively unpopulated areas

•In 2008 we continue to see the greatest number of seals in less populated areas; even on densely populated Oahu, most seals are seen in areas of low human presence

### Other Noteworthy Results from 2008

•Discovery of previously undocumented births (n=8) (Fig.4a)

•Identification of parturient females without prior reproductive histories (Fig.4a)

•10 seals were identified as known individuals based on location, size/sex, presence of tags, scars or other natural marks or applied bleach marks (Fig.4a,b)

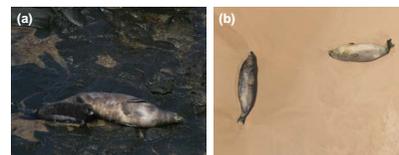


Figure 4. Photos of monk seals observed during the 2008 aerial surveys. (a) Adult females identified as R020 with nursing pup on Molokai. This was the first documented birth for this female. (b) A tagged adult male and an adult female identified as RK30 on Kauai

## Conclusions

•Aerial surveys suggest an increase in population size and changes in distribution over time

•There was a 63.5% increase in seals sighted during the 2008 aerial surveys

•There was an increase in seals counted at both Oahu and Molokai in 2008, which is consistent with increases in known births and reported seal sightings at these islands.

•These surveys represent an index of the population as not all seals are expected to be on land at any one time and detection is not 100%

•In 2008 we identified 101 unique individuals in the MHI (excluding Niihau) based primarily on reports from the general public

•The challenge to surveying monk seals in the MHI is that there are relatively few seals distributed over a vast area, much of which can be difficult to access. Aerial surveys can serve as a valuable tool in estimating abundance and distribution of seals as well as providing access to remote and inaccessible areas.



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