

Title: A Comparison of Manned and Unmanned Aircrafts for Surveying Wildlife Populations:
A Case Study of Gray Seal Populations on Muskeget Island, USA

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Abstract:

Unmanned Aircraft Systems (UAS) are advancing NOAA's ability to survey and sample wildlife populations. Compared to traditional, manned aircraft, unmanned aircraft may be a more cost-effective tool to survey animal densities in some situations, and can also reveal important characteristics of individuals that may be undetectable by aircraft flying at higher altitudes. In this study we evaluate the ability of 3 survey platforms to estimate gray seal density and assess animal characteristics at Muskeget Island, USA, during the 2016 breeding season. Muskeget Island, approximately 1 mile long by ½ mile wide, hosts the largest congregation of breeding gray seals in US waters each winter. On January 15 2016, during the presumed week of peak pupping, a manned NOAA Twin Otter and an unmanned, fixed wing senseFly eBee surveyed the island to document the number of pups and adults. In addition, an APH-22 hexacopter flew transects over a subset of the island to evaluate the ability of this UAS to identify molt stages of pups, sizes of individuals, and signs of human interaction (brands, entanglements). Preliminary results indicate that the total number of seals documented in Twin Otter imagery of the island were almost identical to those documented in imagery generated by the eBee UAS. Images from the APH-22 yielded valuable information about molt stages of pups, revealed signs of human interactions, and achieved size measurements with <5% error. Results of this study suggest that on Muskeget Island, unmanned aircraft can yield comparable seal counts to those obtained from manned aircraft, while also documenting animal characteristics undetectable to manned aircraft. Further research with the APH-22, augmented with additional sensors, is planned for the 2017 field season.