APPENDIX III

Identifying Individual Bowhead Whales Through Aerial Photography

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Aerial photography has been used over the past three decades to identify individual bowhead whales. There are currently >17,000 images of bowheads in archives maintained by the National Marine Mammal Lab in Seattle, Washington, and at LGL in King City, Ontario. Photographs were collected from aircraft flying directly over whales, mostly in the Beaufort Sea in summer and near Barrow, Alaska, during spring migrations. These photographs have been evaluated and categorized for quality and degree of identifiability of each whale and measured for whale length. Analyses of photographic data have provided information on many critical parameters used to evaluate the health of this population. For instance, comparisons of images from spring 1985, summer 1985, spring 1986, and summer 1986 provided an abundance estimate (6,700 whales) close to the average estimate (6,900 whales) from the North Slope Borough's ice-based counts in the same years, and both methods resulted in similar precision. Photographic data have also been used to estimate growth rates of individual whales, size at sexual maturity (13 m), survival rates (bowheads have an amazing longevity), calving intervals (3-4 years), population dynamics (whale lengths are an indicator of maturity classes), and stock structure (via resighting rates within and between various seas as well as testing inter-year consistency of individual whales' migration dates). Although this stock is currently listed as Endangered, the abundance has been steadily increasing, and its status may need to be reevaluated. Analyses of aerial photographs of bowheads may play a significant role in making these management decisions.