

USE OF COMPUTER-ASSISTED MATCHING OF PHOTOGRAPHS TO EXAMINE SURVIVAL OF ALASKAN HARBOR SEALSHastings, K.K.¹, Small, R.J.¹, Hiby, L.²

(1) Alaska Department of Fish and Game, 333 Raspberry Rd., Anchorage, Alaska
First Author Address: Alaska Dept. of Fish and Game, 333 Raspberry Road,
Anchorage, AK, 99518, USA

(2) Conservation Research Ltd., Cambridge, UK

In 1998 and 1999, approximately 1,000 harbor seal (*phoca vitulina richardsi*) adults and pups were photographed during the pupping season (May-June) or after molting (September) on Tugidak Island, Alaska. Photos were taken from all visible sides of the head and neck for seals possessing well-defined pelage patterns. Multiple photos of a single seal were taken on each sampling occasion if possible. Conservation Research Ltd. (CRL) developed a three-dimensional computer model of the head, and determined three "fingerprint" regions for pelage pattern extraction and matching; one each for the left, right and front views. Photos were digitized and image quality was subjectively categorized based on photo and pelage pattern quality. Software developed by CRL was then used to match photos to archived photos of individuals by comparing extracted fingerprints. By using this technique to resight individuals over many years, life history parameters such as survival and dispersal can be estimated using mark-recapture models. An important assumption in mark-recapture models is homogeneity in probability of recapture among individuals. Preliminary examination of data from seals with multiple images indicated a risk of 2-3% of failing to identify a seal when using data from the high-quality photo and pattern category. To examine potential sources of heterogeneity in recapture probability introduced by the sampling technique, we examined effects of (1) photo and pattern quality, (2) viewpoint of the photo, and (3) number of images of an individual available for comparison at both the current resighting occasion and archived in the database, on the risk of failing to identify an individual. Photographs of captive seals taken over multiple years were examined to test for loss of pattern over time and age-effects on pattern loss. Initial estimates of return rates and movement patterns based on two years of photo identification data also will be presented.

Biennial Conference

13th



on the
Biology of Marine Mammals

Nov. 28 - Dec. 3, 1999

The Society for Marine Mammalogy

ABSTRACTS

Wailea, Maui, Hawaii