A FURBEARER ESTIMATOR BASED ON PROBABILITY SAMPLING

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A new method of estimating furbearer abundance is proposed, based on probability sampling results. The method assumes that good snow conditions are present, that fresh snow of sufficient depth to "erase" old animal tracks exists, and that all animal tracks encountered in the sampling process are seen. A slow-flying airplane is used to fly transects oriented perpendicular to an x-axis. Every animal track of the species of interest, as it is encountered along the transect, is followed (from the air) to where the animal started after the storm and forward to the present location of the animal. The locations are then put on a map and the maximum x-axis distance traveled by the animal is calculated; this distance is used to calculate the probability of observing that particular animal during the survey. These probabilities are used to generate the population estimate.

If the tracks of the species of interest are not readily identifiable from the air, then a population estimate can be generated with the use of radio-collared animals. It is assumed that the radio-collared animals are representative of the movement patterns of the population. Under this system, all transects are walked instead of being flown. For each transect the number of different individuals that crossed the transect is recorded. The number of different individuals encountered on each transect is used to generate an estimate of the total x-axis distance moved by the population. The location of radio-collared animals is determined throughout the survey; their tracks are then backtracked between locations and the maximum x-axis distance traveled by each radio-collared animal is recorded. This information is used to estimate an average x-axis distance moved by a radio-collared animal. The ratio of the estimated x-axis distance moved by the population and the average x-axis distance moved by radio-collared animals are used to generate a population estimate.

A population estimate of the number of lynx in a 110-mi^2 (285 km^2) study area on the Kenai Peninsula was generated by

the above method. Twelve two-mile transects were walked, seventy-two hours after a snowstorm, from which it was estimated that the population moved 54.99 mi. (SE = 7.48 mi.) along the x-axis. In addition, two radio-collared lynx were backtracked; their average x-axis distance moved was 3.64 mi. (SE = 0.93 mi.). Putting these two estimates together resulted in a lynx estimate of 14.45 lynx/110 mi^2 (SE = 4.35 lynx/110 mi^2). The resulting 80% confidence intervals were (10.58, 22.26) lynx/110 mi^2.

ABSTRACTS
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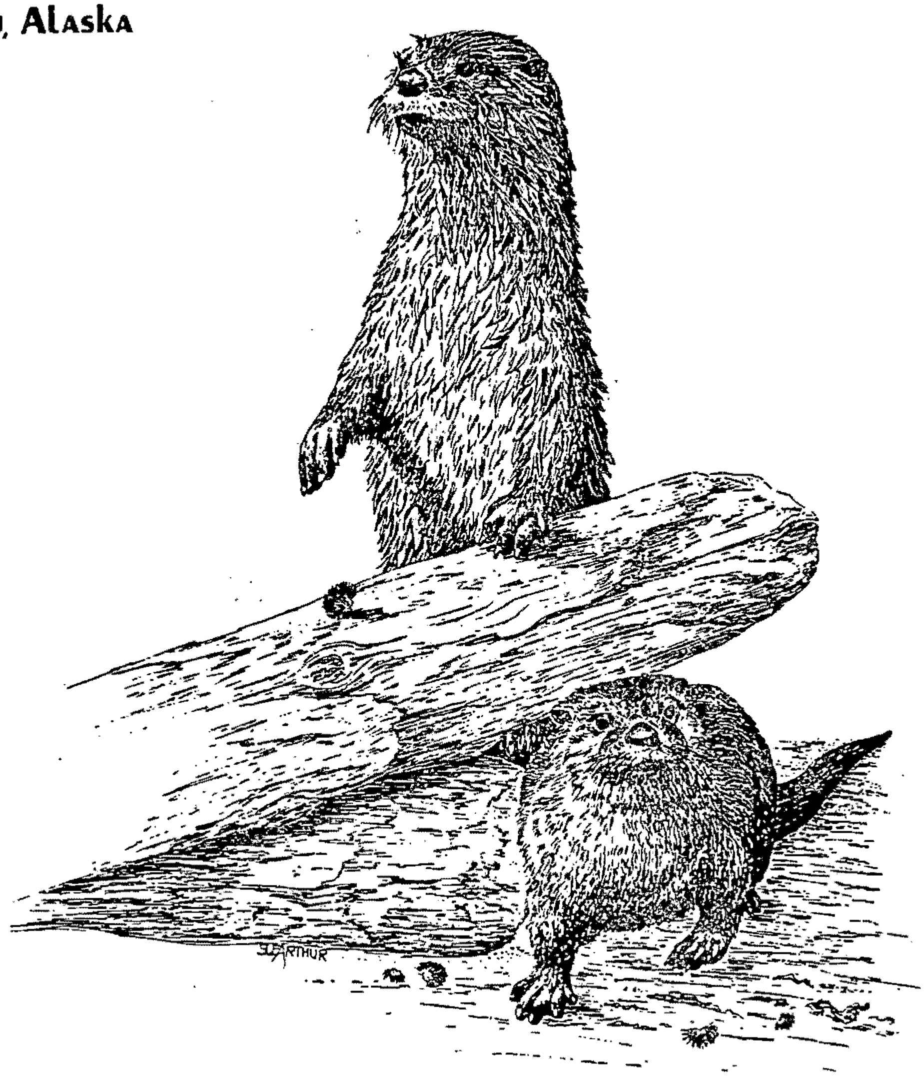

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