

BIOLOGYMORTALITY AND RECRUITMENT
IN A RISING PTARMIGAN POPULATION

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The Alaska Department of Fish and Game is carrying out a long-term project to discover mortality rates and recruitment rates in rising and declining ptarmigan populations. An annual summer banding program begun in 1960 has yielded information on the composition of rock ptarmigan populations in summer on a 15-square-mile area of upland tundra in eastcentral Alaska. The breeding population there rose from 75 to 135 to 170 pairs in 1960-1962 as determined by complete counts of males in spring. Each year about 40 per cent of the adult males, 65 per cent of the adult females, and 15-20 per cent of the juveniles were captured. Recoveries of banded birds indicate that: (1) adult females have a strong tendency to return, for subsequent nesting seasons, to the area in which they first bred; (2) yearling females rarely breed in the area in which they hatched; (3) the philopatric inclinations of males lie somewhere between those of adult and yearling hens; (4) breeding populations were composed of new (immigrant) birds and repeat residents in nearly equal numbers; (5) death rates among hens from the summer of 1960 to the spring of 1961 varied from 40 per cent or less for adults to 45 per cent or more for chicks hatched in 1960; (6) the death rate for hens in 1961 was about 50 per cent for adults and 75 per cent for juveniles; and (7) mortality among males of both age classes was close to 45 per cent in 1960 and about 60 per cent in 1961 (to May 1962). The calculation of mortality rests on the assumption that there is a balance between immigration to and emigration from the study area. Observations of nesting success

and brood mortality showed that reproductive success varied from about 2.5 to 3.0 birds alive in August per bird alive in May. Nesting losses were low in 1960 and 1961 (about 10 per cent) but higher in 1962 (close to 40 per cent).

SCIENCE
IN ALASKA

1962

Proceedings
Thirteenth
Alaskan Science Conference
Juneau, Alaska

August 22 to August 26, 1962

Published by
ALASKA DIVISION
AMERICAN ASSOCIATION FOR THE ADVANCEMENT
OF SCIENCE

April 25, 1963