B-24
S 7a

PNE-428

ED Campbell (2)

PROGRESS LETTER
Investigations of Sea-Cliff Birds, Cape Thompson, Alaska
September, 1960

L. G. Swartz and G. W. Cox

MASTER

Personnel: L. G. Swartz, Senior Scientist
G. W. Cox, Scientist
E. L. Schene, Research Assistant
L. M. Belson, Field Assistant
E. J. Willoughby, Field Assistant (Part-time and
shared with the Terrestrial Birds Project)

Five investigators participated in studies of the sea bird colonies in the vicinity of the proposed harbor site at Ogotoruk Creek. On April 2, 1960, Belson arrived to observe early spring activities. Some of his observations during this period have been summarized in an earlier report. Belson is to remain until about October 1 to observe final breeding activity and departure of the birds from the cliffs, and to continue routine collections. On June 3, Swartz, Cox, and Schene arrived to begin intensive summer investigations. From June 7 to September 8 work was carried out from a camp located at Cape Thompson. From this location populations of all species were more accessible than from the main camp at Ogotoruk Creek. From July 12 to August 6 Willoughby worked with the sea-cliffs party. From August 6 to 28 he was aboard the University of Washington research vessel MV Brown Bear where he observed and collected birds in offshore waters. On this voyage he was acting for both the Sea-Cliff Birds Project and the Terrestrial Birds Project. Data pertaining to sea-cliff birds will be reported by ourselves; that pertaining to other species will be reported by F. L. Williamson of the Arctic Health Research Center. On August 29 Willoughby rejoined the sea-cliff party at Cape Thompson and remained until September 6.

Field work may be grouped in seven categories: 1) a detailed census of all species occupying the sea-cliffs, 2) a qualitative and quantitative analysis of the food habits of the major species in the ecosystem, 3) studies of breeding biology, 4) population dynamics and structure, 5) diurnation, local and seasonal movements, 6) sea bird activity in offshore waters, and 7) miscellaneous activities.

LEGAL NOTICE

This report was prepared as an account of Government sponsored work. Neither the United States, nor the Commission, nor any person acting on behalf of the Commission:

A. Makes any warranty or representation, expressed or implied, with respect to the accuracy, completeness, or usefulness of the information contained in this report, or that the use of any information, apparatus, method, or process disclosed in this report may not infringe privately owned rights; or

B. Assumes any liabilities with respect to the use of, or for damages resulting from the use of any information, apparatus, method, or process disclosed in this report.

As used in the above, "person acting on behalf of the Commission" includes any employee or contractor of the Commission, or employee of such contractor, to the extent that such employee or contractor of the Commission, or employee of such contractor prepares, disseminates, or provides access to, any information pursuant to his employment or contract with the Commission, or his employment with such contractor.

PATENT CLEARANCE OBTAINED. RELEASE TO
THE PUBLIC IS APPROVED. PROCEDURES
ARE ON FILE IN THE RECEIVING SECTION.

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency Thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

1) Census. The census techniques were essentially expansions and refinements of those used during 1959 and will be described in detail in future reports. About 350 4x5 black and white photographs were taken, about 300 of which are an integral part of the census. These will also serve to detect post-explosion changes in ledge topography and occupation. Census data may now be regarded as adequate for the needs of Project Chariot in that yearly sampling of certain portions of the sea bird colonies will suffice to detect population changes before the blast. Following the explosions, however, at least one more complete census will be necessary. Census computations are not yet complete and will be given later.

2) Qualitative and quantitative analysis of food habits of major species in the ecosystem. Food habits data were obtained by collection of stomach contents, fecal pellets, castings, food remains at nesting and eating sites, and by observation of feeding activities. Samples of stomach contents were obtained from routine collections of the most important species (thick-billed murres, common murres, black-legged kittiwakes, and horned puffins); collections were made at weekly intervals (bi-weekly intervals during census activities). These birds were intensively utilized to obtain other fundamental biological data as well. The number of stomachs collected is expected to exceed seven hundred at the end of the field season.

Approximately five hundred fecal pellets and castings were obtained. Food remains collected from nesting and eating sites are unsorted but probably represent several hundred individual food organisms, including invertebrates, fish, birds, microtine rodents, and even a portion of a pinniped.

3) Breeding biology. This aspect was studied over the entire period of cliff occupation by the birds. Belson obtained data on the arrival of the birds at the cliffs; most of these data were reported in the Interim Report, June 1960. Throughout the summer general observations were made of breeding activity along the entire cliff area. In addition, detailed observations of breeding activities of thick-billed murres, common murres, black-legged kittiwakes, glaucous gulls and horned puffins were made on plots where individual nests

could be mapped and observed closely. On these plots regular observations were made of dates of nest-building, egg-laying, incubation, and nestling life, and on behavior of adults and young.

Nests of the less common species were located when possible and checked frequently. Observations were made on interspecific relations, especially with regard to nest site selection.

Birds collected at regular intervals provided data on the development and regression of gonads throughout the breeding cycle. Gonads were measured in the field and preserved for future examination. The appearance and regression of the brood patches was recorded. In addition, these birds were checked for molt and fat condition, and weights and external measurements were taken. Ecto- and endo-parasites were collected and preserved.

The observations on breeding biology will enable an accurate description of the phenology of the various phases of the reproductive cycle to be made of the avian populations of the cliffs as a whole during 1960. In general, breeding phenomena were substantially earlier in 1960 than in 1959.

The majority of murres and kittiwakes were fledged by September 10. Belson will continue to collect data until all birds have left the cliffs (probably about October 1). The majority of adult murres and chicks had left the area as of September 3. Most black-legged kittiwake young were flying but had not left the area as of this date.

4) Population dynamics and structure. Data on reproductive success and mortality were obtained for the more common species. Observations on mapped nest plots will enable calculations to be made of mortality from egg-laying to fledging. Egg and chick mortality was also studied by collecting fallen eggs and chicks along cliff areas where the contributing population could be determined closely. Predation of eggs by glaucous gulls and ravens was recorded by collecting eggs attributable to predation by these species from beaches and cliff tops in the same areas.

Adult mortality on the cliffs, due mainly to rock falls, was recorded by collecting birds found dead or injured beneath cliff areas. Kills attributable to predators were also recorded. In

addition, scats and castings of foxes and predatory birds were collected. Finally, direct observations of predation by glaucous gulls, peregrine falcons and golden eagles were made.

All adult birds collected were skeletonized and heads were saved from many of the birds found dead. From this material it may be possible to devise an aging technique and obtain a picture of the population age structure of the various species.

5) Diurnation, local and seasonal movements. Diurnation and local movements of cliff-nesting species were studied by regular counts on cliff plots and by observation of bird movements in the vicinity of the cliffs. Hourly counts for periods of up to 72 hours were made periodically to determine the diurnation pattern throughout the breeding season. Less frequent counts were made over longer periods during the early stages of cliff occupation in the spring and during departure from the cliffs in the fall.

The program of banding was expanded within the limits of time and personnel to provide a means of obtaining information on seasonal movements. Several hundred thick-billed murres, common murres and black-legged kittiwakes were banded as well as smaller numbers of other species. A special effort was made to band and mark birds from accessible areas. Since birds from these areas may be easily captured it should be possible to substantiate or disprove published statements that murres always return to nest at the same ledges.

6) Sea bird activity in offshore waters. From July 6 to 28 E. J. Willoughby was aboard the MV Brown Bear. He was taken aboard at the mouth of Ugotoruk Creek and made observations from there north along the cruise track to the edge of the ice pack at about 70°50' N., south into Kotzebue Sound, back north to the Cape Thompson region, and south again through the Bering Strait to the end of the cruise at Nome.

His objectives within the framework of the Sea-Cliff Birds Project were to make qualitative and quantitative observations of the cliff-nesting species, to plot their distribution on and over the ocean, to determine the direction and character of their movements,

to determine feeding patterns, and to make such collections as the regimen of oceanographic research permitted. All objectives were realized to a satisfactory degree. These data, when combined with those gathered from shore, will contribute greatly to our understanding of local distribution, movement, and feeding.

The cliff-nesting species seen widely and in abundance far from shore (over fifty statute miles from the nearest shoreline) include both species of murres, kittiwakes and horned puffins. Glaucous gulls and pelagic cormorants were commonly seen close to shore. Other species nesting in the vicinity of Cape Thompson were seen in various locations on the voyage but in small numbers--pigeon guillemots, Kittlitz's murrelets, and tufted puffins. Species involved in the sea-cliffs ecosystem but not nesting on the cliffs included pomarine and parasitic jaegers which were regularly seen far from shore and long-tailed jaegers which were seen twice at distances of about 22 and 35 miles from shore.

Feeding concentrations of murres were seen most abundantly within fifteen miles offshore. No clearly distinguished feeding concentrations were seen at a distance in excess of 25 miles from shore, although murres were seen on the water or flying at almost all times during the voyage. Kittiwakes and glaucous gulls were almost invariably seen feeding in groups close to shore, although kittiwakes were almost always visible even far at sea. Analysis of data, however, must be completed before further statements can be made. Although Willoughby's contribution is invaluable, it is clear that in order to fully elucidate offshore activity more work of this nature is desirable.

7) Miscellaneous activities. In several cases work was carried on primarily by the Sea-Cliff Birds party but in cooperation with other groups.

Collections were made of the flora of the sea-cliffs area. These will be analysed primarily by the University of Alaska Botanical Group.

A series of twelve soil samples with accompanying plants were taken from plots laid out in a grid beginning at the cliff edge at Cape Thompson and extending inland. These will be analysed by the Ohio State University Soils Group primarily to determine the influence of guano from the sea-cliff birds on soil nitrogen and in turn on the flora and rodent fauna in the area adjacent to the cliffs.

Samples of sea-cliff birds for radiochemical analyses were given to the Hanford Laboratory group. Data for these birds will be reported by this group.

Fecal pellets of terrestrial vertebrates collected by the Sea-Cliff Birds party will be used by our group and by the Terrestrial Mammal group. Mortality data for mammals falling from the cliffs and from small mammals utilized as food by members of the sea-cliffs ecosystem will also be shared with this group.