FISHERIES RESEARCH BOARD OF CANADA

MANUSCRIPT REPORTS OF THE BIOLOGICAL STATIONS

No.

416

Title

A Report on the Mortality of the Shore Invertebrates at Nanaimo, B. C. - July, 1950

Author

D. B. Quayle

1952

A REPORT ON THE MORTALITY OF THE SHORE INVERTEBRATES AT NANAIMO, B. C.- July, 1950

by
D.B. Quayle
Provincial Shellfish Laboratory

According to reports received by the Dominion Department of Fisheries at Nanaimo, on and about July 4th, a considerable mortality of many types of marine invertebrates had occurred in the Nanaimo area, especially on the outer shores of Protection Island.

In company with Capt. M. B. Gay and Mate T. B. Gregory, of the Fisheries Patrol Vessel "Atlin Post", the above-mentioned area was visited during the low tide of Tuesday, July 4th, 1950. The section of shore from Gallows Point around the outer or gulf shore of Protection Island around to the gap between Protection and Newcastle Islands was examined in detail.

In general, the seaweeds appeared to be healthy, although the occasional frond of Fucus was burned brown. In several of the small bays the very young plants of Zostera, the eel grass, appeared to be newly dead.

Except for occasional individuals, most of the polychaetes appeared to have suffered.

The ochre sea star, Pisaster ochraceous, which is the commonest echinoderm in this district, had experienced nearly 95% mortality. The remaining 5% were still alive but somewhat moribund, showing very little activity of the tube feet and exerted none of the usual pull on the substratum. One specimen of Dermasterias imbricata, the Leather Star, was found and it, too, was dead. The Sand Dollar, Derdraster excentricus, also experienced considerable mortality. Many of the Sea Stars showed aboral lesions typical of lime burns.

Of the crustaceans, considerable numbers of the kelp crabs, Pugettia, were dead, as were a considerable number of the shore crab, Hemigrapsus nudus.

The other shore crab Hemigrapsus oregonensis seemed to have suffered little. Assessment of mortality among the barnacles is very difficult but, in general, they appeared to have taken very little harm.

Among the gastropod molluscs the large Moon Snail, Polonices lewisii, experienced a high degree of mortality. No living specimens were found; the dead ones were numerous and never before has the author seen so many specimens of this species at one time but, of course, under normal conditions the majority of them are buried in the sand. Not all, but a considerable number of limpets were also dead, as were the majority of the chitons.

Among the Lamellibranch molluscs, the cockle, Cardium corbis, suffered the greatest degree of mortality, which must have approached nearly 100% and included all sizes and ages.

The Pacific oyster, Ostrea gigas, and the Native oyster, Ostrea lurida, appeared to have suffered no ill effects. Only occasional specimens of the blue mussel Mytilus edulis were found dead and in the main this species suffered no ill effects as far as could be ascertained.

The Sand Clams, Macoma nasuta and Macoma secta experienced a heavy mortality. One Horse-clam, Schizothaerus nuttallii, was found dead but the majority appeared to be in good condition.

Only occasional butter clams were found dead but all those living appeared to be in a moribund condition with the siphons extended abnormally and exhibited very little retractive reaction upon stimulus.

The Little-neck clam, Venerupis staminea, appeared to have suffered not at all.

It appeared that species such as the oyster, mussel and little-neck clams, which are able to seal the body completely within a watertight shell, were able to withstand whatever was the cause of the mortality. The greatest

mortality had occurred in the Echinoderms, polychaetes, crustaceans and certain species of clams whose body tissues are unprotected. Mortality appeared to have occurred approximately one week before the time of examination. This period was one of extreme low tides coupled with fine weather and fairly high temperatures. It is doubtful, however, as has been suggested, that the high temperatures experienced at this time were the cause of this mortality. Judging from the records at Ladysmith Harbour, the water temperatures at this time were not extraordinarily high and no exceptional mortality among the shore fauna there was observed.

Subsequent examination of the Vancouver Island shore from Dodds Narrows to Yellow Point showed some mortality, but of a magnitude considerably less than that at Protection Island, expecially in the Narrows area and largely of the sea star Pisaster ochraceous. The numbers of dead animals became reduced toward Yellow Point and conditions were entirely normal, as far as could be ascertained in that region.

The situation existing at Protection Island and in the immediate neighborhood is apparently a local condition due, no doubt, to the influx of a particular type of water mass. The general result is not dissimilar to that experienced in other parts of the world from the so-called "red tide". However, there was no evidence that this was the case in this instance. It would be unfair at this time to place the blame on the nearby pulp mill at Harmac which had recently started to operate although, under the right conditions, mortality in sessile shore organisms can be considerable due to the effects of pollution from pulp mill effluents.