

NEHALEM BAY DUNGENESS CRAB SURVEY
May 17-18, July 19-21, and August 8-10, 1966

Introduction

Letters and newspaper articles concerning the low quantity and poor quality of Dungeness crabs in Nehalem Bay have been frequently received by the Oregon Fish Commission. Popular opinion usually places the blame for the lack of legal-sized bay crabs^{1/} in the Nehalem estuary upon the adjacent commercial crab fisheries.

A sampling program was initiated by Oregon Fish Commission personnel to evaluate crab abundance. This report summarizes the information obtained in Nehalem Bay (Figure 1) during three sampling periods, May 17-18, July 19-21, and August 8-10, 1966. Data from Yaquina and Netarts bays are included for comparative purposes.

Methods

Crab pots, baited with fish carcasses, were placed in the Nehalem estuary from Crab Rock, near the mouth, to Brighton, approximately one mile upstream. The pots were checked twice daily. All medium and large crabs captured were measured, checked for shell hardness, and released. The crab pots were allowed to fish through two incoming tides during each of the sampling periods.

Crab pots and rings were fished simultaneously on August 10 to obtain comparative catch data for the two types of trapping equipment.

On August 10, 1966, seven crab pots were fished in Netarts Bay, 13 miles south of Nehalem Bay. These pots were allowed to fish only four hours while the tide was flooding.

^{1/} Personal-use and commercial bay crab legal size is 5-3/4 inches straight line measurement across back exclusive of spines. Commercial ocean crab legal size is 6-1/4 inches.

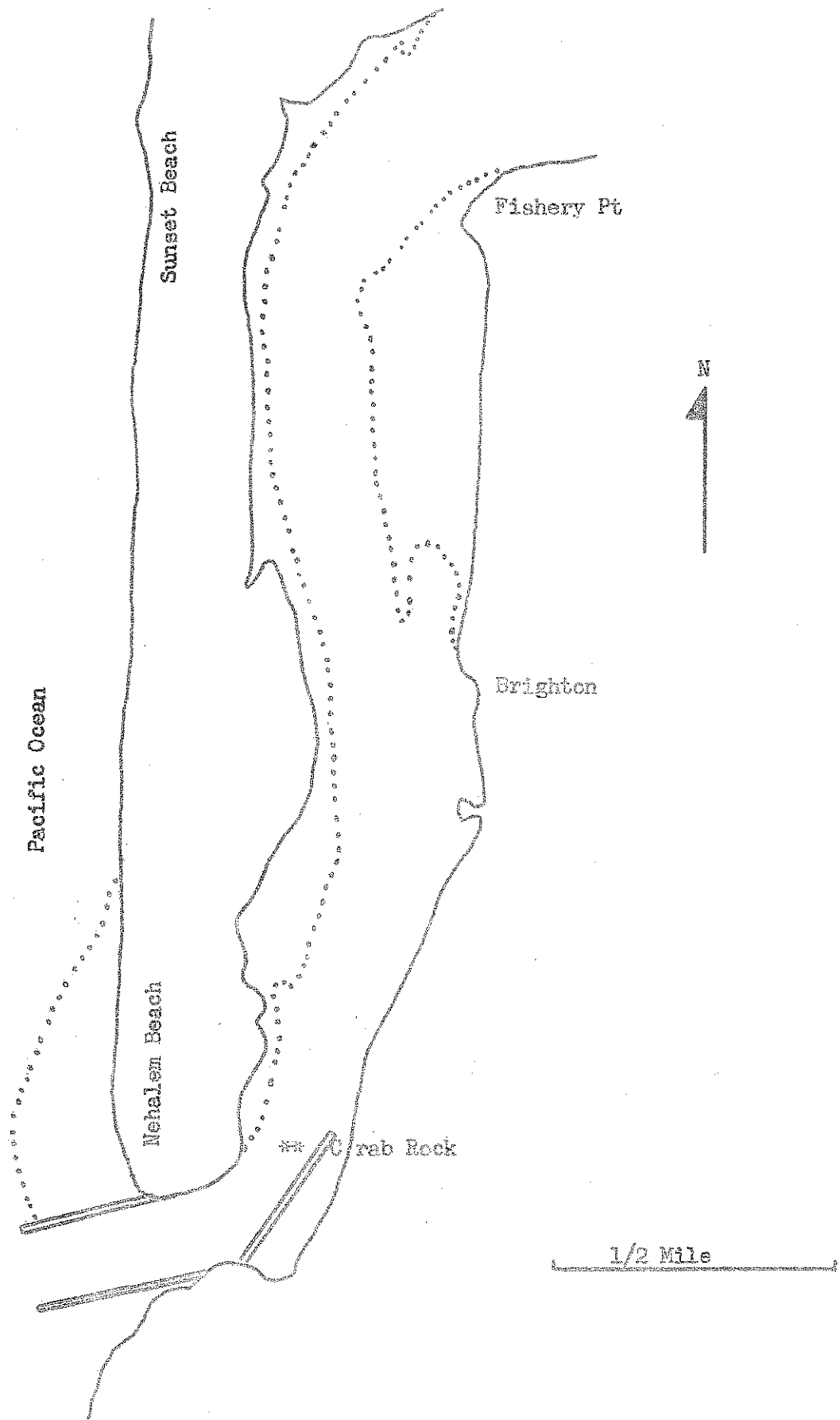


Figure 1. Southwest section of Nehalem Bay.

During April 19-21 and October 19-20, 1966, bay crab test fishing was conducted by Fish Commission personnel on Yaquina Bay. Catch per unit of effort and size frequency data were obtained. This test fishing was not done in conjunction with the Nehalem Bay study, however the data obtained are usable on a comparative basis.

Salinity of the Nehalem estuary was monitored in the sampling area on May 17-18 to determine the effect of spring runoff upon entry of crabs into the estuary. Salinities were taken at the bottom, mid-depth, and surface, however salinities of importance to the crab occur only at the bottom.

Resort operators on Nehalem Bay were contacted for comments on personal-use crab fishing during each sampling period.

Results

A summary of the crab catch for sampling period in Nehalem, Netarts, and Yaquina bays is given in Table 1. Fishing effort varied in terms of numbers of crab pots used and the length of time they were allowed to fish. To standardize the results, the number of pots was multiplied by the hours fished to obtain "pot hours." This number divided into the number of legal-sized male crabs captured yields the number of "legal males per pot hour."

The Nehalem crab catch for the three sample periods was lower than either the Netarts or the Yaquina Bay catches. The Nehalem catch was relatively constant over the sampling periods, decreasing slightly as personal-use fishing progressed through the summer.

Although Yaquina Bay test fishing did not occur within the Nehalem sampling periods, the catch of legal males and low percentage of softshells indicate a more desirable crab population for the personal-use fisherman.

During the four-hour fishing period in Netarts Bay the catch indicated a sizeable population of legal male crabs. However, more than one-half of the legal males taken were in the softshell condition.

Table 1. Crab catch data from Nehalem, Netarts, and Yaquina bays during the 1966 survey.

Date	Bay	No. of males	No. of legal males	Per cent legal males	No. of softshell legal males	Per cent soft	No. of pots fished	Hours fished	Pot hours	Legal males per pot hour
Apr. 19-21	Yaquina	128	119	92.9	0	0	10	60	600	0.19
May 17-18	Nehalem	111	15	13.5	3	20	6	24	144	0.10
July 19-21	Nehalem	39	12	30.7	7	58	4	37	148	0.08
Aug. 8-10	Nehalem	52	20	37.4	8	40	7	41	287	0.07
Aug. 10	Nehalem	18	3	16.6	1	33	3 rings	6	18	0.16
Aug. 10	Netarts	78	24	30.7	14	58	7	4	28	0.85
Oct. 19-20	Yaquina	117	78	66.6	6	7	8	36	288	0.27

No salinity measurements taken during the spring survey were below the tolerance level of Dungeness crab. Low tide salinity measurements at the bottom ranged from 19 ‰ at Brighton to 29 ‰ at Crab Rock.

The crab ring, used extensively by personal-use fishermen, was more efficient at catching legal crabs than the crab pots over short fishing periods. This seems reasonable as there is no obstruction in a ring comparable to the small entrance tunnels in a crab pot. The pot with adequate escape ports holds large crabs over long periods of time and allows the juvenile crabs to escape. During the sample periods in Nehalem Bay many juvenile crabs were captured. These crabs were small and difficult to handle without injury. From the standpoint of reduced injury to juvenile crabs the pot is the preferred type of trapping equipment.

The high incidence of softshelled male crabs is a usual occurrence in the estuaries of Oregon during the summer months. Although softshelled crabs can be found year around, there are significant migrations of male crabs into bays for the molting process. Yaquina Bay is a prime example of such a migration. During July and August, certain portions of the bay abound with male crabs in either the premolting or postmolting condition. This occurrence has been reported by SCUBA divers and has been observed by Fish Commission personnel on several occasions. The molting of Dungeness crabs is a biological process, and is not affected by either commercial or personal-use crab fishing. After molting, many of the crabs remain in the bay where they are caught by personal-use fishermen. The timing of molt in Nehalem, Netarts, and Yaquina bays appears to coincide.

Resort operators on Nehalem Bay expressed their concern over the poor quality and quantity of crabs entering the personal-use fishery. They seemed convinced the commercial ocean crab fishery operating off Nehalem Bay was responsible for the lack of crabs entering the bay. During the

August sampling period, after the ocean crab fishery had terminated, resort operators agreed that personal-use fishing success had increased significantly. This increase, however, was not evident from the sampling data.

There seemed, at times, to be a relationship between the person asking questions and the answers given. During the May sampling period, one biologist, representing the Oregon Fish Commission, was told the bay crab fishing would be no good until the thousands of crab pots were removed from the mouth of the bay. Another biologist, posing as a tourist, was told by the same resort operator that the crabbing was excellent.

Discussion

The history of the Dungeness crab fishery in Oregon has been one of fluctuating populations and increasing commercial and personal-use demands. The annual commercial crab catch in Oregon for the past ten years has ranged from 3.5 to 13.0 million pounds. The catch fluctuates with the abundance of the year class entering the fishery.

Many factors have contributed to the ever increasing recreational demand on Oregon estuaries. New access routes to the coast, better transportation, and more leisure time have led to greater utilization of the natural resources of these areas.

Nehalem Bay, situated close to populous Multnomah County, is used by many sportsmen for fishing, crabbing, and clamming. The personal-use crab fishery has felt the pressure of these demands.

Direct competition arises between commercial and personal-use crab fishermen. Early crab regulations were based on the concept of two distinct races of crabs: bay crabs and ocean crabs. Size limits and commercial seasons were founded on this concept. Subsequent tagging operations revealed a significant interchange of crabs between ocean and bay.

Commercial ocean crab fishing occurs mainly during the winter and spring to take advantage of the hard shell condition. The bulk of the ocean fishery terminates by June. By this time approximately 90% of the commercially legal male crabs in the ocean have been caught.

Commercial bay crab fishing is allowed throughout the year. The bulk of the catch is taken from July through November to coincide with the tourist season and closed ocean season. Much of the commercial bay catch is marketed, through fresh fish stands, to summer travelers.

Tillamook Bay is located six miles south of the Nehalem River. The commercial crab landings at Tillamook Bay totaled 1,253,375 pounds in the last three years. During these years, 478,633 pounds were landed as bay crabs. According to catch statistics, the ratio of bay crabs to ocean crabs landed in Tillamook is the largest of any port in Oregon.

Along with the low abundance of legal-sized male crabs, another noticeable deterrent to good crab fishing for sportsmen in Nehalem Bay was the hundreds of juvenile crabs entering the pots and rings immediately after the gear was set. These small crabs consumed bait rapidly and were injured easily when removed from the traps. It is most discouraging to the sportsman to buy bait and rent crab rings only to have the bait quickly eaten by small crabs that are difficult to handle.

Summary

Resort operators and sportsmen on Nehalem Bay feel the adjacent ocean and Tillamook Bay commercial crab fisheries are responsible for the low quantity of crabs entering the bay during the summer.

A Dungeness crab survey was conducted during the summer of 1966 in the Nehalem estuary. Crab pots and rings were fished from Crab Rock to Brighton

during sampling periods in May, July, and August. Test fishing in Yaquina and Netarts bays provided comparative data on catch per unit of effort. Salinity measurements taken in the Nehalem sampling area were within the tolerance levels of crabs.

Catch data indicated the crab population in the Nehalem estuary was relatively constant during the summer months, but was considerably lower than in Yaquina and Netarts bays. The high percentage of softshelled male crabs in Nehalem and Netarts bays during the summer coincided with the molt migration of crabs into Yaquina Bay.

The crab pot is the preferred type of trapping equipment for holding large crabs over extended periods while allowing juvenile crabs to escape. Ocean crabbers, using the same resource as bay crabbers, harvest approximately 90% of the legal male crabs in the ocean during the commercial season. The bulk of this catch is landed prior to June in the major ports. Commercial bay crab fishing coincides with personal-use fishing during the summer and fall. Competition exists because these two groups use the same resource. ?

Jack Neilsen
Oregon Fish Commission
Shellfish Biologist
Newport, Oregon

March 29, 1967

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