HYDRAULIC CLAM HARVESTING

INTRODUCTION

During the summer of 1961, a seafood dealer at Charleston, Oregon hired SCUBA [1/] divers to harvest clams in subtidal areas with hydraulic equipment. This operation proved to be quite efficient and was attended by considerable publicity. During the summer of 1962, several commercial and personal-use diggers equipped themselves with pumps and motors and began to harvest clams intertidally with this equipment. The efficiency and destructiveness of this method of harvesting has caused some concern among people in the Coos Bay area and the Oregon Fish Commission. This report deals with observations and conclusions of the OFC shellfish staff at this time.

MATERIALS AND METHODS

The basic equipment involved in the hydraulic harvesting of clams is a gasoline-powered water pump mounted in a boat. The pumps have intakes ranging in diameter from 1 inch to 2½ inches and are powered by air-cooled gasoline engines. The lead-off hose can be anything from a ½-inch garden hose to a 2-inch fire hose. Two methods are used to wash the clams out of the soil: (1) the nozzle is inserted in the clam hole and the clam is washed out; or (2) the mud is literally "blasted" away and clams washed out. Information gained on this method of clam harvest was obtained by observing commercial and personal-use diggers using hydraulic equipment, and by experimenting with similar equipment.

Coos Bay Observations

On November 13, 1961, observations were made on a subtidal clam harvesting operation. In this operation, clams were being taken just below the low tide level in areas bordering known intertidal clam beds. The

1/ Self-contained underwater breathing apparatus.

harvest was conducted from a 22-foot boat equipped with an air compressor, for the diver's air-line, and a 2-inch gasoline powered pump nozzled down to 3/4 inch. One diver found and "staked" clam holes and the other diver proceeded to wash out the clams previously located. The two divers were taking about 100 pounds of clams per hour at that time. Many small clams were incidentally washed out.

On August 15, 1962, a personal-use clam harvester was observed in Coos Bay using hydraulic equipment to harvest clams. This man was using a 3/4-inch pump powered with a 2½ h.p. gasoline motor. While under observation, he harvested 20 large gaper clams and 19 small gaper clams ranging in size from 1 to 1½ inches in length. These clams were left exposed. When this man was informed that he was exceeding the bag limit, he informed the observers that he was harvesting the excess for friends.

Experimental Observations

On May 22, 1963, shellfish project personnel, equipped with a 1½-inch pump and motor, experimentally dug gaper clams in Yaquina Bay. The first technique employed reduced the main-line from a 2-inch outlet to 1 inch with a ½-inch garden hose attached. This equipment permitted removal of gaper clams in 35 seconds from a depth of 12-18 inches. The effect upon the bottom from the equipment was to leave a 24-30 inch circle of washings in the area where the clam was removed and a hole 6 inches in diameter and 12-18 inches deep. Sand clams, bent-nose clams, and one razor clam were exposed for possible predation by this method. Though not many people utilize the first two species they are edible and it is not deemed desirable to destroy them needlessly. The second technique employed involved the removal of the reducer and the ½-inch garden hose. The 2-inch main-line then was used to wash out clams. By this method nine square feet of clam bed was washed out to a depth of 18 inches in 1½ minutes. This operation exposed all sizes and species of clams, and in

general caused heavy damage to plants and animals alike.

Digging clams with a shovel also displaces smaller clams but they are usually covered, hence not exposed to predation. When the pump is used these clams float out and are exposed to predation by gulls, crabs, or starfish.

DISCUSSION

The ability to take clams with hydraulic equipment has been known by the shellfish staff for several years, and in fact has been employed to obtain clams for marking studies. Only within the last two years has this method of harvesting clams become a serious problem. With the attendant publicity in the Coos Bay area it is expected that the use of this equipment probably will spread to other estuaries. The states of Washington and California prohibit the use of any equipment other than hand-powered tools such as rakes, hoes, or shovels to harvest clams. Washington biologists feel that hydraulic equipment is quite detrimental to clam beds since it regrades the bottom materials and destroys associated plants.

Our experiments indicate that this equipment, when used on a limited basis, is probably no more destructive than a shovel. However, large pumps utilizing fire hoses would be very detrimental to the clam beds. Another bad feature of this equipment is the destruction or exposure of juvenile clams or other species to predation. In Coos Bay observations, it was recorded that as many juvenile gaper clams were left exposed as were kept. Another serious feature of this equipment, and probably the greatest potential danger to the resource, is the high degree of efficiency. The gaper clam is an animal displaying slow growth, and if subjected to intense digging pressure can very readily be reduced in abundance. Accompanying this reduction in abundance is a reduction in the average size of individual animals harvested. This, in effect, reduces the potential yield of the resource.

The commercial clam harvest in Coos Bay during the period July through December, 1962, amounted to 46,626 pounds compared to 7,406 pounds in 1960, and 13,690 pounds in 1961. Of the 46,626 pounds landed in 1962, 46,173 pounds are known to have been gaper clams harvested with hydraulic equipment. No breakdown by species is available for the years 1960 and 1961 because the clams were reported mostly as "bay clams". Two divers working with SCUBA gear in 1962 were harvesting as much as 2,000 pounds of gaper clams per day and averaging 728 pounds per landing.

It can be argued that the divers are harvesting a resource that is untouched by most clam diggers, but all subtidal harvest to date is taking place on the outer perimeter of known intertidal clam beds. It has always been the opinion of the shellfish staff that these animals served as a seed reserve for restocking intertidal areas in case of intertidal decimation. Also, if the subtidal area becomes depleted there is nothing to stop divers from working the intertidal area during high tide. No regulations at present prevent this. Even if it were illegal, policing would be virtually impossible. If these areas were to be harvested on both low and high tide we would soon be without gaper clams.

As information on this type of equipment spreads more and more commercial diggers will undoubtedly start using it. Also, personal-use diggers who become discontented with the present bag limits when taking clams is so easy will either exceed their bag limits or buy commercial licenses so they can harvest more clams. Thus, the digging pressure on this species may increase to an undesirable level.

CONCLUSIONS AND RECOMMENDATION

Observations indicate that if properly employed, hydraulic harvesting of gaper clams is probably no more harmful than digging by shovel. If improperly employed it is very detrimental to associated species and bottom conditions.

The gaper clam is a slow-growing animal and can readily be reduced in abundance. The efficiency of this equipment constitutes a threat to the abundance of gaper clams in Coos Bay and other areas where it might be employed. Subtidal clam beds, because of channel dredging and other factors, are limited to narrow bands adjacent to intertidal beds. It is believed that these beds form a seed stock reserve for intertidal areas and constitute a major safeguard against overdigging within the intertidal area. Hydraulic equipment, by its washing and floating action, exposes many small clams, both gaper and other species, to predation by gulls, crabs, fish, and starfish. While digging with shovels also dislocates clams, the animals are not exposed as readily as when hydraulic equipment is used.

In view of the foregoing, it is the recommendation of the staff that clam digging be limited to hand-powered tools such as shovels, rakes, hand-operated suction pipes, or the "plumber's friend".

As an alternative to complete outlawing of hydraulic harvest of clams, a permit system could be initiated. Permits for specific operators could be issued on a seasonal basis, each permit tailored to a specific area, hydraulic device, operator, and shellfish community. We believe such a permit system to be impossibly difficult to enforce.

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