A Review of the Soft and Peeler Crab Industry of Virginia, With Special Reference to the Peeler Pot Fishery

W. A. Van Engel, VIMS

Marine Resource Report #84-1
January 1984 (Revised)

A review of the soft and peeler crab industry of Virginia, with special reference to the peeler pot fishery.

W. A. Van Engel
Virginia Institute of Marine Science
Gloucester Point, Virginia
January 1984 (revised)

The soft crab industry of the Chesapeake Bay provides over 90% of the total U. S. production of soft crabs and is worth approximately 2 million dollars. Virginia's average soft crab production, 1975-1979, was 40% that of the Bay.

Although Virginia's hard crab landings are over 40 times its soft crab production, soft crab value per pound is almost five times that of the hard crab. Because only a relatively small portion of the stock of crabs in the Bay is harvested for soft crab production, there is a large potential for expansion of the soft crab industry.

Peeler crabs are those developing an inner soft shell beneath the old shell, in preparation for growth through molting (shedding). Peeler crabs are held in tanks of salt water or in floats until the crabs molt. The time from one molt to the next varies with the size of the crab and with temperature: for the 2-1/2 to 4-1/2 inch width size range utilized by the industry, the time interval varies from 23 to 36 days. Shedding occurs from late April to early October in the Bay region. Peelers are classified by color designations that are

closely linked to the stage of development of the new, inner shell and to the number of days that will elapse before the molt occurs. White sign crabs are the farthest from shedding (7-13 days) while pink and red sign crabs are nearest (3-6 and 1-3 days). Non-peelers are usually called hard or green crabs.

In Virginia, most peeler crabs are caught with peeler pots and crab pound nets: lesser amounts are taken with scrapes, trotlines, hard crab pots and dip nets. Estimates of the harvest by these gear are obtained by canvass and are approximate. No reliable estimate can be made of the number of watermen using peeler pots or of the number of pots used. There is no separate license for the use of peeler pots in Virginia: current law allows a waterman to use peeler pots if he has a hard crab pot license. For comparison, each peeler pound net must be licensed; hence the level of effort is known, assuming that all gear licensed are used. Currently, the number of hard crab potters licensed is in excess of 2100.

Virginia peeler pots are constructed with 1-inch hexagonal mesh galvanized wire, with a 24x24 inch base and a height varying from 18 to 24 inches depending on the choice of the pot manufacturer and where the pot is to be used. Legal use in Virginia requires that the pot be baited only with live male (jimmy) crabs. Sexually mature males secrete a sex hormone, a pheromone, probably in the urine, that attracts only those juvenile female crabs approaching their final (terminal) molt. Males are placed in compartments in the pot, physically isolated from captured females, and are replaced with new, live males approximately each week. Thus, the peeler pot, as presently designed and used, is a device for capturing female peelers.

Peeler crab abundance during the year is bimodal. There is a short 3-4 week peak of abundance in the spring, a scarcity in late spring, and a 12-14 week mode of abundance from July through early October. The harvest depends on the gear used, the location and the actual abundance of the stock. Temperature and available food are major factors in determining the rate of growth of crabs and of crab behavior in relation to the gear. Thus, the numbers and sizes of crabs taken by peeler pots will differ from the catch by crab pound nets or scrapes.

Generally, most of the crabs harvested in spring are large crabs hatched two years earlier, and because there is a preponderance of large females approaching their final molt, the peeler pot baited with males is very efficient. These peelers molt to become soft crabs 4-1/2 to 5-1/2 inches or wider. Because of spring water temperature variations, the spring catch may run from late April to late May, or from late May to mid-June.

The rapid expansion of the spring peeler pot fishery in recent years has placed a premium on large, healthy male crabs for "bait". In the same months there is a rapidly expanding public demand for large, meaty male crabs for consumption at home and in restaurants. The hard crab pot fishery supplies crabs for both demands, but the spring catch consists of a mixture of peelers, papershell and hardshell crabs. Competition for the papershell and hardshell male crabs is accompanied by prices of $25 to $30 per bushel (about 75 crabs), which is two to three times the average summer price. Prices of $60 to $90 per bushel have occurred when male crabs were scarce.

Considering that blue crabs are voracious feeders, regularly providing the jimmy "bait" crabs with fish scraps might keep the males healthy and alive for several days or weeks, reducing the need for and the attendant high cost of replacements. A reasonable solution is to permit adding food for the male crabs during the spring months, from the first of May to the fifteenth of June.

Most of the summer harvest is comprised of smaller male and female crabs hatched one year earlier. Size (width) varies from 2-1/2 to 3 inches in early July to 3-1/2 to 4-1/2 inches in late August and early September. Since only a small portion of the peeler stock consists of large females approaching the final molt, peeler pots are least effective in summer. Effectiveness of the pots increases after mid-August as "terminal-molt" females become more abundant.

If the only consideration of a law or regulation was to effect a larger catch, then permitting fish baiting of peeler pots would be productive, for the bait would attract many small hard and white sign (early stage peeler) male and female crabs to the pots. Late stage peelers (pink and red sign) are less or not at all attracted to fish bait. Conceivably, the increase in harvest of these hard crabs and early stage peelers could be exponential.

After mid-June and through October 15, the end of the peeler pot season, adding fish scraps to a pot ostensibly as food for jimmy crabs can be considered a devious means of baiting for small crabs. Although, as stated earlier, abundance of "terminal molt" females increases in late August, those females can be baited by male crabs that are in plentiful supply and are low priced at that time of the year.

Undoubtedly, a law permitting fish baiting of peeler pots could have substantial effects on other activities relating to the Virginia blue crab industry, such as law enforcement, hard crab potting, the crab meat picking industry, retailing, and the stability of the Bay's blue crab population.

1) Watermen use pots with 1-1/2 inch mesh wire to catch hard crabs. Virginia law allows a maximum of 10% of hard crab landings to be hard crabs less than 5 inches in width. Peeler crabs (white, pink and red sign) are exempt from this limitation. Most Virginia watermen can easily comply with this law most of the year. But in July and August every year, and occasionally at other times, when many small crabs are caught, inspection of the hard crab catch is a major task of the Virginia Marine Resources Commission enforcement division. Inspection effort will be multiplied if enforcement officers must examine the catch of every peeler pot fisherman to determine the portion of undersize hard crabs. Even if Virginia adopted the Maryland requirement that peelers and hard crabs must be sorted by watermen into separate containers, the enforcement officers would not be relieved of the need to examine the catch.

2) The effect(s) of the potential increase in fishing pressure on the local, resident crab stock is debatable, since no scientific study of that situation has been made and possibly could not be devised. At issue is whether the juvenile crabs that migrate from the spawning grounds of the lower Bay to a tributary (the fishing site) complete the migration by an arbitrary date, say June 1 of the year following the year of hatch, and that no additions to the tributary's stock occur after that date. Fishing of the stock, plus natural mortality,

would gradually reduce the abundance, possibly to a point where hard crab fishermen using the standard 1-1/2 inch mesh wire pot found the catch reduced to levels no longer profitable, considering the time and expense of fishing. Also, the potential sale of hard crabs, whether legal size or not, by peeler pot fishermen, could reduce outlets for sales by "standard pot" fishermen. Fearful of these conditions developing, hard crab potters may strongly oppose baiting of 1-inch mesh peeler pots.

Only in the rare instance when there has been an extremely successful hatching and survival of a year class of crabs, and the Bay and its tributaries are "overpopulated" with small crabs actively competing for available food and space, will a reduction in abundance result in a "normal" crab growth rate.

3) The Virginia crab meat picking industry usually buys almost the entire crab catch from all types of gear from Labor Day (early September) through April or May; and at other times buys only adult females and the smallest legal male crabs. However, when the crab harvest cannot meet the demand for picked meat, some processors might find sublegal size crabs a ready source of crab meat. Similarly, when legal size crabs are scarce and/or expensive, sublegal crabs may be used by "Mom and Pop" (home kitchen) picking facilities as a source of crab meat or used by seafood bars for use in crab soups. Thus, the peeler pot fishermen catching large numbers of crabs in baited pots may find a ready demand for sublegal hard crabs.

4) The public may knowingly or unknowingly buy sublegal hard crabs at docks, on the street, in retail outlets or in seafood bars.

5) Reference was made earlier (comment # 2 above) to the possibility that intensive fishing for small crabs, plus natural mortality, in a tributary might reduce stock abundance to a level uneconomical for hard crab fishing. Consider the possiblity that the total stock of the Bay, instead of one tributary, is affected, although the likelihood is small. The peeler and soft crab industry would expand at the expense of the hard crab industry, but the economic return from increased sales of soft crabs would be many times larger that the loss of sales of whole, hard crabs and crab meat.

Currently, the population of blue crabs in the Chesapeake Bay is considered to be in a healthy state, relatively unaffected by chemical and physical conditions that have caused general deterioration of the Bay's environment and adversely affected many animal and plant stocks. The good condition of the blue crab population is evidence that current fishing levels have not harmed the ability of the crab to rebound if overexploitation occurred, that the reproductive capacity of the blue crab is sufficient to replenish the population.

In summary, my recommendation is that food for jimmy "bait" crabs be permitted in peeler pots from the first of May through the fifteenth of June in any year, but that baiting with fish or any other food after mid-June would do harm to the blue crab industry.