OPERATION BABY CLAM IN FLORIDA*

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Abstract

The development of dependable techniques for laboratory culture of seed clams in quantity has spurred interest in the commercial potential of growing baby clams in Florida where marketable sizes are reached sooner than in northern states. The Florida State Board of Conservation chose six people (an electronics engineer, two seafood producers, a vocational agriculture teacher, a biologist and a county planner) to receive hybrid and northern hardshell baby clams for growing in protective boxes along the Gulf and Atlantic coasts. Additional quotas of these clams from Milford, Connecticut, were delivered to the University of Miami Marine Laboratory for direct seeding and to Florida State University for studies under the supervision of Dr. Winston Menzel. From the middle of November 1960 to the middle of June 1961, hybrid clams grew from lengths of 1/8 inch or less to maximum lengths of 1 1/2 inch and northern hardshells grew from lengths of 1/4 - 1/2 inch to maximum lengths of 1 3/4 inch wherever protective boxes remained intact and predators were successfully excluded. The work is continuing with the hope that, as surviving clams grow large enough, they can be placed on suitable bottoms, enclosed within screened frames and grown to marketable size. Frequent inspection of baby clams and, preferably, local hatchery sources of seed clams are needed for successful clam farming in Florida.

Introduction

Recorded hardshell clam production began in Florida in 1880, increased significantly in 1908 with the exploitation of large clam beds in Collier and Monroe Counties near the Ten Thousand Islands, grew steadily until the peak year of 1932, remained at a high level through most of World War II and plummeted to a beginning low by 1950 with cessation of the clam industry in Collier and Monroe Counties Since 1950 production has increased modestly. Table 1 shows production for selected years from 1880 to 1960 (taken from Fishery Statistics Digests, U. S. Fish and Wildlife Service).

Table 1.
Clam Production in Florida
(Pounds)*

YEAR	EAST COAST	WEST COAST	TOTAL
1880	5,000		5,000
1908	57,000	182,000	239,000
1923	5,000	602,000	607,000
1930	49,840	661,736	711,576
1932	12,000	1,108,812	1,120,812
1940	6,700	701,100	707,800
1945	3,000	687,700	690,700
1950	900	4,400	5,300
1955	6,300	15,700	22,000
1960	2,134	23,893	26,027

* 5.20 pounds of meat per U. S. Standard Bushel (Florida East Coast)
8.00 pounds of meat per U. S. Standard Bushel (Florida West Coast)

The reason or reasons for disappearance of the clam population in the Ten Thousand Islands area are obscure. Hurricanes, red tides, freshwater and mechanical harvesting have been blamed but not substantiated. Since the shutdown of the three canning plants at Marco in Collier County, Sarasota County has been the leading producer of clams on the west coast and in the State.

Invariably the densest concentration of clams on the west coast of Florida are found on firm, sticky mud bottoms with the attached sea grasses, Thalassia testudinum König, turtle grass or Diplanthera wrightii Ashers, Cuban shoalweed, or both growing abundantly.

Clam production on the east coast of Florida has been concentrated from Volusia County northward but yields have never approached the peak years of 1908 and 1930 since 1932.

Florida has experienced its greatest population boom since the major decline in clam production after 1945. New residents have generally preferred to settle in the coastal regions of south Florida. Dredging and filling to create waterfront real estate from shallow, bay bottoms was rampant and unfortunately, virtually uncontrolled from 1950 to 1960. Vast drainage projects were completed to reclaim low uplands for residential and agricultural sites. Now State and Federal laws and coordinating acts have been passed that include marine conservation in criteria for permitting projects that might alter marine environments and adversely affect marine productivity.

Natural mortalities and recoveries of shellfish populations are cyclic under pristine conditions. Unless tempered, environmental changes induced by man militate against recovery and virtually assure a downward trend in abundance. The by-products (pollution, siltation, hydrographic changes etc.) of urbanization, industrialization and land development must be compensated by planned shellfish culture. The State Board of Conservation makes biological studies in all the

potential shellfish-producing areas in Florida. Water temperatures, salinities, depths, turbidities, tides, bottom types, vegetation, presence or absence of shellfish and predators, and other pertinent data are recorded. Information is available for advising on lease locations and shellfish culture.

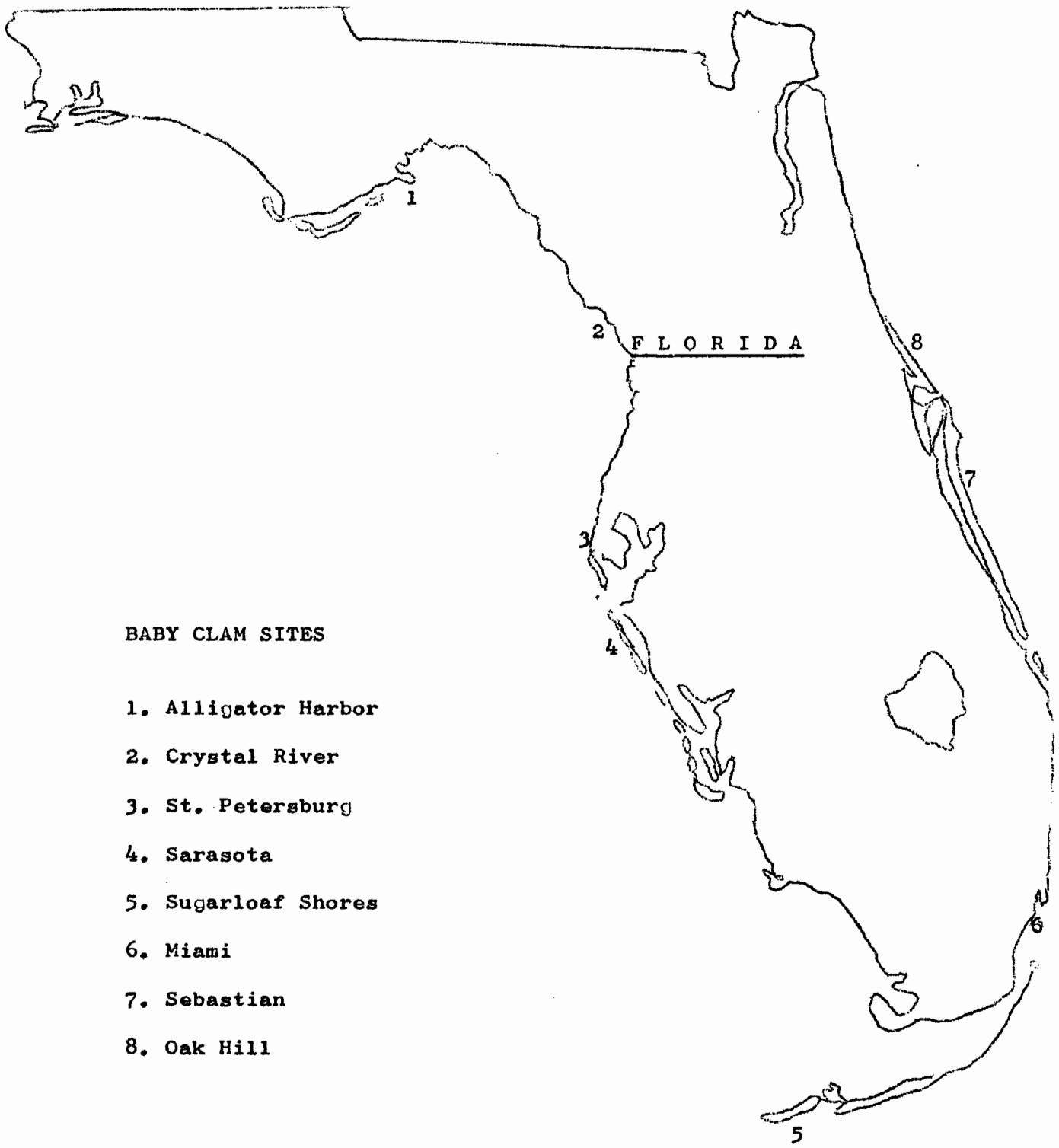
In Florida waters clam growth is not normally interrupted by low winter temperatures. Consequently, clams reach marketable size more quickly than in temperate zone waters. With this knowledge and the prospect of decreased production in other areas and increased demand locally and nationally, interest in clams and clam culture has grown in Florida. The State recognizes the potential in planned aquaculture of clams especially since the development of dependable techniques for culturing supplies of seed clams by Dr. Victor Loosanoff and his colleagues at the Milford, Connecticut laboratory of the U.S. Fish and Wildlife Service.

During the 1960 shellfisheries' meetings in Baltimore a discussion was held with Dr. Loosanoff about getting a shipment of baby clams for distribution around the Florida coast, (see map, p.5). Subsequent correspondence resulted in Dr. Loosanoff's bringing chilled baby clams in plastic bags to Miami by commercial airline on November 11, 1960 when he arrived to attend a biological meeting. Loosanoff was met at midnight at the airport, the clams were placed under refrigeration that night and delivered by two State airplanes the next day to three locations along the Atlantic (east) coast and Tallahassee where Dr. Winston Menzel accepted a much larger quota than the other recipients for growth and other studies at the Oceanographic Institute of Florida State University. On November 12, 1960 the remaining baby clams were delivered by automobile to Sarasota and St. Petersburg. On November 16, 1960 half of the clams held in a bay at St. Petersburg were by automobile to Crystal River.

Specifications prescribed by Drs. Menzel and Loosanoff for building screen-top boxes to protect the baby clams against predation had been sent to all prospective recipients. Only those who had built the boxes received the clams except Durbin Tabb, Biologist, University of Miami Marine Laboratory who extemporaneously requested some seed directly in a small tidal lagoon near the laboratory.

Each recipient received about 600 Mercenaria mercenaria (1/4 to 1/2 inch) and 2000 hybrids, ♀ Mercenaria campechiensis X ♂ Mercenaria mercenaria, (1/16 to 1/8 inch). The six locations chosen except Crystal River were ones where water salinities would not be expected to be less than 20 o/oo, the recommended minimum for clams.

Separate discussions of each location, personnel and gross results follow (see map, p.5).



BABY CLAM SITES

1. Alligator Harbor
2. Crystal River
3. St. Petersburg
4. Sarasota
5. Sugarloaf Shores
6. Miami
7. Sebastian
8. Oak Hill

Alligator Harbor (Franklin County): Dr. Winston Menzel received a grant from a seafood company for a cost feasibility study of raising hatchery clams to marketable sizes. His clams delivered by the State Board of Conservation were doing well but Dr. Menzel became ill in June shortly before I had hoped to see his operation at the Florida State University marine laboratory. Results at Alligator Harbor will have to be reported at a later date.

Crystal River (Citrus County): D. C. Crawford, vocational agricultural teacher, and his students at the local high school placed their clams in Crystal Bay that lies between the more saline water of the open Gulf and Crystal River. This section of the Florida coast is a drowned limestone plateau with many fissures from which alkaline freshwaters flow. Marine animals are found in lower salinities here than in most other areas apparently because of the hard freshwater. Recorded salinities have ranged from 13.0 o/oo to 28.0 o/oo. On November 16, 1960 when the clams were placed, the salinity was 17.0 o/oo. Recommended higher salinities could have been found farther into the Gulf but it was not deemed feasible or safe to venture farther with a school group as periodic trips to check survival and growth would be essential. This group also has experimental plantings of oysters in its saltwater farming program. Unfortunately, during placement of the clams three of the four protective boxes turned over and many of the small hybrid clams were lost. Additional mishaps occurred on April 27, 1961 during handling of the boxes. All but one box was lost and the clams in this had been badly depleted by the initial difficulties. Because of these happenings, results have been inconclusive.

St. Petersburg (Pinellas County): Bonnie Eldred, Biologist, Florida State Board of Conservation Marine Laboratory provided space for baby clams under the dock at her Madeira Beach home on the western

shore of Boca Ciega Bay about one-quarter mile north of Johns Pass that connects to the Gulf of Mexico and assures a good tidal flow. Depending on tides, water depths range from one to four feet. Salinities are very constant and rarely go below 30.0 o/oo or above 34 o/oo. The hybrid clams tripled or quadrupled in size and the northern hardshells doubled in size by February 19, 1961 when they were shifted to extra boxes to prevent overcrowding. Mortality was negligible and virtually confined to M. mercenaria at that time. Water temperatures had increased markedly during a record-breaking heat wave during February 1961. By the middle of June 1961 the hybrids had grown to maximum lengths of 1 1/4 inch, the northern hardshells to 1 3/4 inch. Approximately three-quarters of the hybrids had survived but one-half of the northern hardshells were lost when the screened lid of one box was dislodged and the clams were washed out or eaten by predators. A number of young clams have been found in the bottom near the boxes. They are larger than the ones in the boxes and presumably are the northern hardshells that were lost since there were no clams in this area previously.

Sarasota (Sarasota County): Ralph Davis, a planning and recreational specialist for Sarasota County, placed his quota of clams in a small saltwater pond behind his home on the eastern shore of Little Sarasota Bay. Mr. Davis had previously studied clam culturing techniques for two weeks at Milford, Connecticut. Baby clams that he had brought from Milford grew about one inch from April 1, 1960 until August 5, 1960 when they were killed by sudden freshwater intrusion into the small pond. Salinities generally range from 27.0 o/oo to 31.0 o/oo in this section of Little Sarasota Bay. By the middle of June 1961 hybrids had grown to maximum lengths of 1 1/2 inches and northern hardshells to maximum lengths of 1 1/4 inches. Since then some of the clams have been placed on the open bottom and enclosed by chicken wire. These clams appear to be growing faster than the ones remaining in protective boxes.

Sugarloaf Key (Monroe County): John Sammy, a crawfish fisherman, placed his quota of clams at the tidal cutoff between Sugarloaf and Saddlebunch Keys about 10 miles ENE of Key West. This location beside the Straits of Florida has near oceanic salinities and no fluvial drainage. Mr. Sammy had planted 1300 adult northern hardshell clams at this location in the summer of 1959. These thrived but apparently never reproduced. By the spring of 1961 they had all disappeared. On May 30, 1961 Sammy reported that he had found 10 or 12 large brown worms, six to eight inches long, but no baby hybrid clams or even dead shells in the protective boxes that were tight and intact with hardware cloth screening. Of his original 600 baby northern hardshell clams, 278 were still alive and ranged in length from 5/16 to 11/16 inch.

Miami (Dade County): The baby clams that were seeded in a small tidal lagoon without protective boxes apparently did not survive predation. During a check made in April, biologists from the University of Miami failed to find even single valves at Virginia Key.

Sebastian (Indian River County): Mr. L. L. Fraunfelder, an engineer at the Cape Canaveral missile-testing center, placed his quota of clams on November 12 in the Indian River just north of the Sebastian River bridge on U.S.1. Seven days later 50 percent of the hybrids and ten to 15 percent of the northern hardshells were dead. No dead clams were found on November 26. Salinities in this section of the Indian River range from 21 to 29 o/oo. Drainage projects to develop farm and residential sites have tended to lower salinities in the Indian River. Sebastian inlet is man-made and unstable. Unless this inlet is kept open to admit salt water, salinities will probably drop below the optimum for clams. By the middle of June hybrid clams had grown to maximu lengths of 1 1/4 inch and northern hardshells had grown to lengths of 1 3/8 inch. The sand was changed regularly to rid the protective boxes of crabs that

had apparently entered when very small.

Oak Hill (Volusia County): Norman Jeffries, a veteran oysterman from New Jersey, placed his quota of baby clams near his Indian Mound Fish Camp at the northern end of Mosquito Lagoon. This site is about 13 miles south of Ponce de Leon inlet that lies between Daytona Beach and New Smyrna Beach. Salinities generally range from 23.0 o/oo to 32.0 o/oo unless there are torrential rains and large upland runoff such as accompained hurricane Donna and lowered salinities enough to kill oysters that Mr. Jeffries had planted. Clam growth was checked on January 19, 1961 and it was found that the hybrid clams had grown at a rate great enough to equal the size of the northern hardshells that had nearly doubled in size themselves. By May 15, 1961, the hybrids and northern hardshells had grown to one inch in size. Five hundred of the northern hardshells and 1800 of the hybrids were still alive.