

**Soft Shell Clam Habitat Creation and Associated
Population**

**Expansion Following Significant Marine Soil
Cultivation/Disturbances**

**LIS - EPA HRI Sub- Committee on Shellfish
T. Visel April 21, 2008**

**A Review of Three Case Histories Following The Gale
of 1898**

Abstract: New England communities have often experienced periodic production fluctuations of the soft shell clam, Mya arenaria. Explanations for such production fluctuations include disease, pollution, loss of habitat, over harvesting, environmental constraints, and predator/prey relationships. While any of the above explanations have site specific merit a look at three fisheries histories provides a more natural system explanation. Large increases in populations appear to be linked to a large natural "habitat creation" event. The soft shell clam is often an opportunistic colonizer of near shore estuarine soils. As habitat is created, other habitats may be lost or gradually become unproductive. Traditional shellfish management and restoration efforts need to consider the impact of storm related significant habitat creation events. Losses of productivity may result naturally from such events while creating new habitats in other areas. Habitat creation (large scale) therefore could be largely beyond the control of municipal shellfish management agencies.

Within the last century, three New England communities have experienced tremendous changes in soft shell productivity. They include Clinton, CT located in the middle of the state just west of the Connecticut River, Chatham, Mass located at the south east end of Cape Cod opposite Nantucket Island and lastly Marshfield, Massachusetts at the confluence of the North and South Rivers, south of Boston. All three communities experienced dramatic changes in production/productivity for soft shell clams between 1900 and 1910. After reviewing fishery history records and reports some common factors have emerged, all three experienced a barrier beach inlet in which a new split allowed dramatic changes in the soil characteristics of sub tidal habitats. The changes in the barrier beach ecology occurred after a very powerful storm in 1898, the so called

"Portland Gale" which hit New England in late November of that year.

Within 5 years, all three communities would record enormous soft shell population increases adjacent to the "new" barrier beach inlets. This paper reviews two basic questions, the impact from storms on estuarine ecology and secondly if such events prepared "marine soils" for sets of the soft shell clams. Written reports, newspaper articles and US Fish Commission accounts appear to confirm that these circumstances were not isolated.

Keywords: cultivation of marine soils - soft shell clams - Mya arenaria habitat creation, population fluctuations related to physical soil changes, fisheries histories, shellfish management policies for municipal shellfish commissions.

Introduction

"The Shellfishery (soft shell) used to be in two areas (1900's) Pleasant Bay and Monomoy. They would find the clams near new cuts on the sand flats. It would be good for a few years and then die out. It was like these clam beds were born as they would suddenly appear. We thought it was from the new sand from the cut but no one could say for certain."

Comments from John Hammond - retired commercial oyster grower Chatham Mass during the December 1982 interview "T. Visel personal communication."

"M. L. Blaisdell said he had experimented with a spot of mud flat about 30 feet square. He had sprinkled such a spot with sand to the depth of about two and one-half inches and in a short time clam holes were found so numerous that he could hardly put his fingers between them. One man he knew of had dug twenty bushels from the tract and another as many more."

Excerpt from a Clinton Recorder Newspaper Article Clinton, CT Friday, January 23, 1903 "To Propagate Shellfish" about dense concentrations of soft shell clams in Clinton Harbor Connecticut. The dense concentrations occurred east of the barrier beach inlet locally called the "Dardinelles."

"Previous to 1898 no clams were ever dug in the North River (Marshfield Mass), but in the great storm of that year (1898) when the City of Portland (steamship) was lost, the river cut a new deep mouth through the beach, giving free access to the tide, which soon destroyed the edible grasses of the marshes and made them in a large part dead flats. Clams began growing in large quantities and thousands of bushels have been dug and carried away each year."

Part of an account by Professor A. D. Mead of Brown University of a new soft shell clam population described in a 1906 Shoreline Times Article "Successful Clam Culture."

Each of the above refers to a location in which soft shell clams exhibited rapid population increases following a storm event.

The Shoreline Times - March 8, 1906

Successful Clam Culture

Constantly Growing Commercial Pursuit

"A Bit of Clinton History and Some Interesting Statistics of
the Work in the
Pine Tree States"

On January 21, 1903 a special town meeting was held here to act on the resolution petitioning the general assembly to grant to the town of Clinton the privilege of leasing certain mud flats in the harbor which were absolutely unproductive of either clams or oysters, to citizens of the town with a view to propagating long clams {mya - "steamers"}. The resolution proposed to lease to citizens of the town one acre tracts at \$10 per year with privilege of renewal, these tracts not to be sublets. It was these mud flats which were explained to be too soft for successful clam culture with sand from the harbor bar nearby. A similar experiment in modern clam culture carried on by M. L. Blaisdell here on a limited area had proved very successful. The motion instructing the representative to introduce the resolution was carried after considerable discussion 84 to 24.

On March 3rd a hearing was granted by the committee of fisheries and game and the resolution was favorably reported and later passed the senate. Determined opposition was met within the house by the person of the representative from Guilford, who presented to the members that this was merely the entering wedge to the passing of a "god given right of the people along the shore" to private ownership which in view of the utter bareness of this harbor mud of every form of absence in life was about as far from the fact as the moon from the earth.

However the resolution was defeated but this matter of scientific clam culture is growing every day and particular forest and stream and atlas fish culturist as well as the daily press are beginning to record its possibilities and triumphs. That something be done to repair the constant drain and rapidly growing scarcity "this god given right" in this vicinity is an evident as the succession of the seasons

and the matter of propagating long clams here is not a dead issue by any means.

The following taken from the New London Day of late date shows to some extent what is being done along this line. The members of the Rhode Island Fish Commission were naturally elated when they learned recently that a large stock company capitalized at 300,000 had been organized in the State of Maine for the purpose of raising clams for the market in enormous quantities. This is the first corporation that has ever been established for such a purpose in the country, if not in the world and is a direct outcome of the experiments that have been carried on in this state. Unlike the majority of corporations, this company has been formed for the purpose of cultivating and propagating a food product, universally known and consumed by all people in all countries. The farms of the bivalve have crossed the ocean and although clam cultivation is a comparatively new industry, it is rapidly forging to the front and bids fair in a short time to take its place well up in the ranks of the great fish industries in this and foreign countries. The season unlike the oyster season not only supplies the market with a delicious and dainty food product throughout the year but ships hundreds of barrels daily to Europe and the continent, and the demand for both home and foreign consumption is rapidly increasing to such extent that clam culture today opens one of the greatest fields of its kind.

Until recent years, there has been no domestic clam culture, the supply of the market being relied upon from the original beds, but as the danger of exhausting the supply is plainly apparently, large plots have been leased from the fish and game commissioners of New York and other states, and beds have been planted occupying hundreds of acres, each acre at a most conservative estimate being valued \$1,000. The value of the crop of last season for the State of New York was 110,000 with every prospect of a much greater growth and value.

Clam canning factories have recently opened another field for the industry thus making a further increase necessary and unless some other means of supply are immediately found, there will be few if any, of the popular shellfish left for consumption, clams having been brought to the brink of extermination.

Few people realize that the average cost of clams in the shell is from 1.50 to 2.00 per bushel, and with the supply diminishing and the cost increasing the clam will soon reach that state of food production whence it becomes a luxury.

Commissioner Nickerson of the State of Maine in a recent statement said "I am far more concerned about the clam industry than I am about the lobster, and measures must be adopted of the people of the state would save the enormous losses in the future." The value of the sold in Maine after the year 1904 was approximately 285,600 of which nearly 70,000 cases were canned. In 1904 Maine had 24 canning factories worth 250,000 which sold 70,290 cases valued at 198,000. Thus some idea can be gained of the business which no doubt, many of our readers are unfamiliar with.

The company owns and controls 450 acres of clam flats situated on the {North River} mass peculiarly adapted to the culture of clams. Previous to 1898 no clams were ever-dug in the North River, but in the great storm of that year (1898) when the City of Portland was lost, the river cut a new deep mouth through the beach, giving free access to the tide, which soon destroyed the edible grasses of the marshes and made them in a large part dead flats. Clams began growing in large quantities and thousands of bushels have been dug and carried away each year.

Professor A. D. Meade, Ph.D. distinguished biologist, a member of the Rhode Island Fish Commission, and probably the best authority in the world on shellfish culture having conducted experiments there in. For seven years, has twice inspected these flats. Speaking of one place that he looked at said "the set there is thick enough to produce 3,000 bushels to the acre. The main thing is a suitable bottom and the best proof of a suitable bottom is this great abundance where the turf has been sufficiently removed to give them a change to come in."

By proper turfing, grading, and planting it seems certain that the whole area owned by the company can be made immensely productive. The spat a float in the tides willing to a great extent, if not wholly supply the seed, and planting seed beds and young clams can easily supplement that if necessary. The plant once prepared, nothing remains but together, the crops, there is no sewage or other pollution in the river thus the quality will be of the best and command the highest market prices. The tides feed the

clams; ice and frost cannot destroy them, and with the land and seeded it remains forever, and the cost of maintenance is nil. Harvesting for an eager market is the only expense. Nature's laboratory does all the rest. There is no other business of which this can be said.

Experiments recorded in the published report of the Rhode Island Fish Commissioner show that while on some limited portion of their beds, production was at the rate of over 3,000 bushels to the acre, taking the whole of the tract under cultivation it was at the rate of 1,750 bushels to the acre. Their experiments also showed that they attained marketable size at two years of age.

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