# Potential Impacts of Small-Scale Commercial Mariculture in Southampton Public Waters

# Feasibility Study

**Prepared for the Southampton Board of Trustees**
**Southampton, NY**

**by**

**TerrAqua Environmental Science and Policy, LLC**
3754 Jenifer Street NW, Washington, DC 20015
202-244-4300 • info@terraqua.org • www.terraqua.org

TerrAqua
Environmental Science and Policy, LLC

April 2003

## CONTRIBUTORS

**Daniel J. Grosse**
TerrAqua Environmental Science and Policy, LLC, Washington, DC

**Dorothy L. Leonard**
TerrAqua Environmental Science and Policy, LLC, Annapolis, MD

**Richard C. Karney**
Martha's Vineyard Shellfish Group, Oak Bluffs, MA

**Leo Goldstone**
World Statistics Ltd., New York, NY

**Robert S. Kallen**
RSK Strategies, LLC, Chicago, IL

**Kevin J. Morse**
Samish Bay Consulting, Easton, MD

**Patricia Salkin**
Government Law Center, Albany Law School, Albany, NY

## EXECUTIVE SUMMARY

### Introduction

Southampton's commercial fishermen, like those in many coastal communities, are no longer able to make a living from shellfish harvesting. Wild shellfish stocks have declined in the waters in and around Southampton, and living by the water has become too expensive for many baymen, affecting their water access. Yet these traditional fishermen and their trade are a large part of Southampton's history and present ambience. Without them, Southampton would lose much of its identity as a coastal fishing community.

Small-scale shellfish aquaculture may provide marine-based livelihoods for these displaced fishermen and, so, preserve a lifestyle crucial to Southampton's character. Long Island communities have made substantial efforts to retain their farming heritage; shellfish "farming" would parallel this commitment. Small-scale mariculture could tap into the growing consumer demand for traditionally produced local products. Aquaculture can also reduce fishing pressure on and enhance local wild shellfish stocks.

Recently, support for, and education about, local aquaculture has increased significantly, and some local baymen have begun small-scale aquaculture operations in State waters of the Peconics adjacent to Southampton. These developments have raised interest in expanding such operations into Trustee-owned waters. The Southampton Board of Trustees consequently commissioned a study to evaluate the feasibility of small-scale commercial aquaculture in Shinnecock and Moriches bays.

Our study assesses the potential for local aquaculture from a variety of perspectives (environmental, regulatory, policy, economic and productivity), assessed interest and community concerns, determined what additional, site-specific information is needed (such as for sites the study found best suited for aquaculture), and outlined possible next steps. We include a market assessment, cost-of-production models and a survey of various stakeholder groups to determine attitudes, concerns and potential objections.

### Natural resource management and government structure

We discuss federal, state, county and town governance, and relevant multi-jurisdictional programs, as they relate to shellfish culture in Town waters.

### Local environment and natural resources

Shinnecock and Moriches bays both have a long history of shellfisheries. Despite the present decline in the wild shellfisheries (due to overfishing, more predatory crabs, brown tides, loss of

eelgrass and other factors), the consensus is that the bays are capable of supporting shellfish culture.

Our review of available data suggests that environmental factors in Shinnecock and Moriches bays are generally favorable for culturing the major commercially harvested mollusk species that occur naturally—oysters, bay scallops, hard clams, mussels, soft-shell clams and razor clams. There is fairly consistent freshwater input, shallow depth, long axis oriented with prevailing wind direction, high (but not excessive) nutrients, moderate salinities (28-30‰), well-mixed water and limited ocean exchange (estuary water residence times may be up to three months).

The area presents environmental challenges for aquaculture. The shallowness of both bays can result in rapid temperature rises, stressing shellfish. Some gear, such as upwellers, hanging trays and lantern nets, can be used only in some of the deeper areas. Winter icing may preclude other kinds of aquaculture structures in shallow areas. Growers should be mindful of, and be prepared to manage around, shellfish diseases (though not extensive) and sporadic harmful brown tides. Southampton's year-round population is expected to grow, increasing boating and other water-oriented activities and reducing opportunities for shellfish farming.

While it is technologically possible to grow all of the above-mentioned species in parts of Shinnecock and Moriches bays, species choices, for commercial culture, depend also on economic potential, ease of culture and minimizing use conflicts.

**Shellfish culture methods**

We describe some of the common growing apparatus, and discuss their advantages and disadvantages in Shinnecock and Moriches bays. Most local growers in adjacent waters culture oysters in rack-and-bag gear (plastic mesh bags containing oysters, which are held in metals racks).

The suitability of any proposed aquaculture site depends, in part, on the culture methods and gear employed.

**Ground and water surveys**

In addition to looking at existing data, we conducted ground and water surveys to evaluate Shinnecock and Moriches bays for shellfish aquaculture potential. As a first step, we mapped potential culture areas most likely to support shellfish culture and least likely to conflict with other uses—such as eelgrass beds, protected marine resources, bay scallop habitat, heavy boat traffic areas. We discussed and refined the potential areas with the U.S. Coast Guard, a U.S. Army Corps/interagency review panel, baymen, the Trustees, academics and Southampton bay constables.

**Information from local experts**

We conferred with many local experts—growers, baymen, consultants, members of environmental organizations, academics, Shinnecock Nation members, local, state and federal government representatives, members of other related committees—about local aquaculture operations, the acceptability of private, small-scale aquaculture, conducting surveys, ecological changes in Shinnecock/Moriches, potential aquaculture locations and many related issues. These discussions also helped shape the stakeholder survey.

**Public meetings and related committees**

We also attended meetings of the Watershed Task Force for Quantuck Bay, the Suffolk County Aquaculture Committee (at which study team member Rick Karney made a presentation about Martha's Vineyard's experiences with small-scale shellfish culture in public waters) and the Peconic Bays Aquaculture Advisory Committee.

**Telephone survey of potential stakeholders**

This survey was designed to elicit detailed information from a sample of potential stakeholders about their assessment of the issues, concerns and thoughts on shaping the program, and potential objections. We identified, after discussions with the Trustees and many local experts, nine potential stakeholder groups:

1. Waterfront property owners—year-round
2. Waterfront property owners—second home
3. Boaters
4. Marina and waterfront restaurant owners
5. Members of the Shinnecock Nation
6. Baymen
7. Members of environmental organizations
8. Duck hunters
9. Representatives of waterfront neighborhood/home organizations

We mailed out a cover letter in advance, describing the survey and providing background on shellfish culture. We sampled 79 people.

Overall, 52% of those surveyed thought that the Trustees should allow private aquaculture in public waters. Another 20% replied negatively, and the remaining 28% were unsure. Respondents were generally willing to accept movable equipment, and with some restrictions such as location, size of operation, number of floats, visibility and frequency of maintenance.

Providing more opportunities for local baymen and improving the environment were considered the most important objectives to sanctioning aquaculture in Shinnecock and Moriches bays. That

providing opportunities for local baymen was the top motivation suggests a strong feeling of community solidarity.

**Market and economic study**

We gathered market and economic data and local information from literature reviews, interviews and visits to local and regional supermarkets, restaurants, wholesalers, fish markets, extension staff, seafood marketing entities and nearby growers.

We found that cultured oysters for the high-end half-shell market have the greatest potential for success. Cultured bay scallops may have potential as well due to favorable market conditions and growing conditions. Based on these findings, we developed oyster and bay scallop revenue models to explore the fiscal viability of local aquaculture operations.

Aquaculture has a high "economic multiplier." Every dollar of revenue generates $7.5 of additional economic activity locally in the form of spending on such items as new equipment, packaging and boat maintenance. For example, if in one year, 20 growers with 100,000 market-size oysters each sell their oysters for $.35 apiece, they will receive a total of $875,000. The economic benefit to the Southampton region is 7.5 times greater, or about $6.5 million. Over the next 10 years, if production increases 50% per year, these shellfish growing operations could contribute more than $85 million to the local economy.

**Aquaculture development elsewhere: conflicts and resolutions**

We reviewed some efforts of other jurisdictions to plan for and manage private aquaculture. A number of countries, states, regional and local governments and industries have developed guidelines for sustainable and environmentally sensible aquaculture development. These guidelines generally promote marine stewardship; establish principles (environmental, operational, management, social); provide standards of conduct and guidance; facilitate cooperation between parties with divergent opinions; and resolve disputes. Public education and participation, interagency coordination, and proactively addressing issues of concern were a common denominator of the most successful approaches. Some jurisdictions are now considering establishing aquaculture zones, similar to other special use areas (e.g., fish trap areas, marine parks).

**Environmental effects of filter-feeding shellfish culture**

Aquaculture activities, depending on kind and location, can be environmentally harmful, neutral or beneficial. They can positively or negatively affect water and habitat quality, as well as surrounding fish, shellfish, wildlife and flora populations.

Potential problems with molluscan shellfish in suspended culture arise from the fact that they are non-moving; their waste products could accumulate over time and contribute to nutrient loading.

These effects can be minimized or eliminated with good husbandry. When a farm is carefully sited, based on habitat suitability parameters such as depth, current flow and substrate quality, the waste products produced in suspended culture will be dispersed widely and the potential impact reduced. In addition, shellfish feed on the ambient biota and require no additions to their diet. The most visible impacts of aquaculture facilities are the physical structures—upwellers, rafts, buoys and other structures. These impacts can be minimized by choice of apparatus and keeping some below the water surface.

Shellfish culture operations can have environmental benefits. Filter-feeding shellfish act as biological filters, and their culture can:

- Improve the quality of local waters by removing harmful excess nutrients.
- Improve biological diversity (a result of the structure provided by the shellfish and cages).
- Help re-seed and build up wild shellfish populations in surrounding waters
- Protect existing wild shellfish stocks by reducing fishing pressure
- Improve the value of waterfront property due to a cleaner environment

**Recommendations**

Shinnecock and Moriches bays are both capable of supporting substantial shellfish farming. The environmental requirements for oysters, clams and scallops are met in most areas. The major impediments appear to be use conflicts. To reduce use conflicts, we recommend geographic separation, established mariculture zones, and public involvement throughout the process.

Relative to bottom culture, movable, off-bottom culture affords (1) more area to grow shellfish (2) accelerated growth rates, (3) improved meat quality, (4) less loss from predation, and (5) less opposition from those against restricting access to the commons.

Based on environmental requirements, ease of culturing and market potential, we recommend culturing native oysters and bay scallops.

Additional recommendations:

- Minimize imports of breeding or seed stocks, and test those imports for parasites and diseases.
- Establish "designated molluscan shellfish nursery and growout management areas" for transient (mobile) gear culture in Shinnecock and Moriches bays.
    - Consider two or three 40-acre growout areas and two shallow 10-acre nursery areas in Shinnecock Bay, and one or two 40-acre growout areas and one shallow 10-acre nursery area in Moriches Bay. The exact number and location of areas, as well as individual spots within each area, should depend on (1) optimal growing conditions; (2) avoiding conflicts with boaters, commercial fishermen and duck hunters; and (3) avoiding eelgrass and other critical habitat areas, and in consultation with shellfish farmers and the public.
    - Ask the Army Corps to "pre-permit" these areas.

  - Issue no more than individual 20 permits.
  - Based on annual growers' plans, assign each grower one nursery area and one growout area. Allow growers to move shellfish from nursery zones to growout zones, and within zones, as needed.
  - Survey eelgrass beds prior to issuing an aquaculture permit for any given site.
  - Perform a "Visual Impact Assessment" to help determine the appropriateness of shellfish equipment in specific locations.
  - Because so little shellfish culture has occurred in Shinnecock and Moriches bays, it is likely that the first culture attempts will by necessity require experimentation with methods and site selection. Therefore, the regulatory framework should include a good deal of flexibility to help insure the success of the new shellfish farmers.
- Allow some of the currently designated fish trap areas, already protected from boat traffic and designated for baymen use, for grow-out culture as well.
- Consider existing boat moorings as potential sites to anchor aquaculture gear such as floating nursery operations.
- Avoid productive shellfish beds for private shellfish culture, but target them for wild clam or scallop enhancement—public aquaculture—projects.
- Consider requiring each shellfish grower to devote a percentage of shellfish to public stock enhancement as a requirement for receiving a permit.

We further recommend developing an oyster gardening program in Shinnecock and Moriches bays. This activity can educate residents on the beneficial aspects of shellfish culture, improve water quality and habitat, and help restore wild populations. It may also help sell commercial shellfish aquaculture to the public.

The final results provide a roadmap for decision-making, whether to proceed with small-scale aquaculture, and what constitutes acceptable, sustainable growth of the industry. The study has application to other coastal communities also contemplating small-scale aquaculture development, but concerned about adverse impacts, liability and the likelihood of success. Sustainable shellfish culture can flourish in communities where broad support exists among residents who, despite differing agendas, can agree on the benefits.