A Business Plan for

Biff’s Best Quahogs

A Case Study
Prepared for the
Aquaculture Business Course,
Agriculture Business Training Program
Massachusetts Department of Food & Agriculture

This case study contains fictional information that has its roots in several Massachusetts’ clam farming operations. It follows a conventional business plan format. The Biff’s Best Quahogs case is intended only as an example of a business plan in an aquaculture context. Your plan may be shorter or longer and it may concentrate on different aspects as you adapt the process to your own aquaculture enterprise. We hope that you will have questions about the data and narrative history of Biff’s Best Quahogs as we chose to present it. Challenging and explaining assumptions about how your business has functioned and how it will go forward is the purpose of an effective business plan. Making and fixing mistakes on paper is far less costly than letting poorly crafted plans teach you the same lesson in the “school of hard knocks.”

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Executive Summary

**Biff's Best Quahog’s** (Biff’s) is a shellfish farming, harvesting and sales business that, until now, has been a part-time business. Biff’s intends to become a full-time occupation for its proprietor, Bradford H. Bivalve, with the injection of borrowed capital. The borrowed funds will enable Biff’s to grow and market enough clams to produce a full-time income and provide a profit for the business.

Biff’s has decided to undertake the borrowing because the conditions listed below support this risk. Put another way; “Even if everything doesn’t go right (and nothing ever does), Biff’s should still be able to produce a profit because of the factors listed below. Those factors are:

**Expanding marketplace:** Shellfish consumption has been rising, and continues to rise, for the foreseeable future. In turn this supports stable or increasing prices.

**Technical Knowledge:** Mr. Bivalve has demonstrated sufficient technical expertise and business experience to weather any production, or technical difficulties.

**Operational Knowledge** Operational knowledge of the production area contributes directly to the quality, and quantity of product likely to survive to harvest. Production difficulties due to location have either been experienced, or have been explained to Mr. Bivalve.

**Risk Awareness:** Awareness of regulatory and business risks is critical to success in this industry: Shellfish farming is a heavily regulated industry and, becoming moreso all the time. Mr. Bivalve is aware of this trend and the regulatory details that are likely to impact him in the foreseeable future.

**Hard Work** Operational capacity, which also includes motivation, for hard work is especially necessary in the start-up phase of a business. Mr. Bivalve’s health is excellent and the addition of an employee next year decreases the risk due to physical injury that exists for all small farmers.

**Financials:** As the historical financials, and projections show, even under more adverse conditions than assumed, Biff’s should see a profit within a year of the investment in equipment.
Company Description

**Biff’s Best Quahogs** is in the business of growing and selling the hard clam (quahog or littleneck – *Mercenaria mercenaria*) to shellfish wholesalers. Littleneck clams are a specific size class of the hard clam and can range from approximately 2.0 inches in length (equivalent to the 1 inch width legal minimum size limit) up to 2.75 inches in length. Littlenecks are consumed either raw on the half shell or as a steamed or roasted product in a variety of food preparations. **Biff’s** has been in business as a sole proprietorship since 1997. The chronology of the start-up of **Biff’s** is included in Appendix One. The overall steps required to grow hard clams are included in Appendix Two.

**Biff’s Best Quahogs** operates from a small shoreside building (25 by 30 feet) at the harborside located of 28 Tideflat Lane in the Quid pro quo region of the Town of Overshoe. This is the site where equipment is stored and the clams are processed and prepared for sale to the wholesaler. Included at this site is a fifty foot wooden dock with shoreside power and freshwater. Water depth at the end of the dock is approximately six feet at low tide. This facility is owned free and clear by the MacClam family and has been in their possession for three generations. Ronald MacClam is my uncle. He has previously provided me access to the building at no cost but will start charging me rent for the building ($200 per month) and provide dock space for my business starting in 2001.

The clams are grown on a three-acre intertidal site in the Boot Hill region of Overshoe Harbor, as specified in MA Shellfish Propagation Permit No. MS1234. This site has been specifically licensed to me for the purpose of growing quahogs. The license was awarded for the duration of five years on 15 March 1997 by the Selectmen for the Town of Overshoe. Renewal of the shellfish propagation license by the town will be required in March 2002. It is an automatic renewal provided that **Biff’s** is conducting the business in a legal manner and that I follow the *Manual of Best Management Practices for Massachusetts’ Shellfish Aquaculture* developed by the Massachusetts aquaculture industry.

I harvested my first small-scale planting of quahogs (planted in 1997) during the fall of 1999 and realized a level of survival of 72% of the initial planting. For an initial investment, from my savings, of $2,500 in clam seed and $258 for other supplies, I realized a gross income of $11,550 and a net income of $8,792. Since 1997, I have planted an additional 200,000 clams per year in 1998 and 1999. The overall cost for the additional years has been $11,032, also supported from my earnings and savings.
My goal is to rely on **Biff's Best Quahogs** as my sole source of income within the next five years and, through this business plan, I will assess my business time schedule to decide if my time schedule and projected plantings are economically reasonable. I also need to test the feasibility of expanding my business to undertake an annual planting of 2,000,000 clam seed. This will require me to hire two part-time employees while providing a full-time income for me. In order for me to make this expansion cost effective, I will have to purchase my clam seed at a lower cost and grow them through the nursery phase (1mm to 15mm valve length) using my own nursery facility.

The impetus to expand the business was derived from the development of a Pilot Crop Insurance Program for Quahogs, developed by the USDA Risk Management Agency in 1998-99. The presence of a crop insurance program provides me access to potential bank financing that was not available to clam growers in the past. Therefore this business plan is designed to test the feasibility of expansion as described in the projections in the financial section. These projections describe the assumptions surrounding and the effects of **Biff's Best Quahogs** planting 2,000,000 field plant size quahogs (12-20mm) per year starting in 2001, and the subsequent borrowing of $35,000 the following year for production equipment. It is anticipated that this business loan, with special pay back circumstances, will suffice for **Biff’s** to complete the expansion of the farm.
Products, Markets & Marketing

As stated above, in the Company Description, Biff's Best Quahogs is in the business of growing and selling littleneck quahogs for the raw bar half-shell market. The sole market for Biff's clams will be a wholesale seafood company.

Biff's Best Quahogs has arranged to sell all of the quahogs produced to a seafood wholesaler (Sam’s Clams, Falmouth, MA), a wholesale establishment that is permitted to purchase shellfish produced in Massachusetts and is licensed on the Interstate Shellfish Shipper's List. The purchase price for Biff's clams is set annually and held at the contract price for the full year. In 2001, the contract price was 17.5 cents per piece for littlenecks. The littleneck price for 2002 has been set at 18.25 cents per piece. Price is negotiated between the buyer and myself and is based on my level of production as well as the past performance of the clam market in the region. In the event that the current contract cannot be renewed in a manner that I believe is favorable to the company, there are more than ten wholesale dealers in shellfish on Cape Cod with considerably more in the New Bedford, MA region. The hard clam market has never been limited within the northeast region although the price of the product may vary somewhat over short-term intervals. Therefore, the development of my business is not contingent on the negotiated purchase price with any one wholesaler.

The overall supply of farmed littleneck quahogs was estimated at 3,693 metric tons, representing 164,464,645 pieces, in 1997 (the latest figures available from National Marine Fisheries Service (NMFS) for a landed value of $30,878,000. This represents an average landed value of 18.77 cents per piece nationally for 1997. The total hard clam landings for 1997, including both wild-harvested and farmed, was 7,189 metric tons with a landed value of approximately 12.74 cents per piece. The price discrepancy is associated with the decreasing value of hard clams as the size increases. The projected annual production of Biff’s Best Quahogs (350,000 pieces) represents 778 bushels of littlenecks per year totaling 46,667 pounds. This corresponds to approximately 0.29% of the annual national cultured clam harvest.

Overall the hard clam market is considered to be very steady with relatively small fluctuations in demand or price. A plot of hard clam prices during the previous ten years indicates that for the past eight years, the price per pound for littlenecks has remained relatively constant. Cultured clams are more favored by dealers and consumers over wild harvested clams due to the consistency in quality and the perception of cultured clams having a higher level of safety due to the regulatory oversight of clam farms (Henderson 1997). Given a consumer preference for cultured...
clams, D. Boyd, under contract to Barnstable County and Cape Cod Cooperative Extension, investigated markets for hard clams throughout the U.S.. Boyd reported that the market for littlenecks is markedly underdeveloped and that the entire crop produced on Cape Cod could be marketed in one mid-western city, such as St. Louis, MO.

In Massachusetts there are currently 400 licensed shellfish farmers farming 1,000 acres of intertidal and subtidal flats. Of these, approximately 66% are raising quahogs. In addition, the wild harvest fishery is continuing to provide an additional amount of quahogs on the market. All of these sources of quahogs could be considered competitors. Although it is very difficult to determine local production levels for quahogs, Biff’s contribution to the local quahog market is estimated to be approximately XX%.

All the quahog farmers in the region are using similar technology to that used by Biff’s Best Quahogs (BBQ or Biff’s). One difference that allows Biff’s to have an advantage over many of the other growers is the site selected for growing Biff’s clams. The Boot Hill region of Overshoe Harbor is characterized by having ideal sediment for growing hard clams coupled with a high rate of water flow over the sediment due to the tidal flow at the mouth of the harbor. This combination of environmental conditions suggests that the clam growth rate and survival will be higher than many of my competitors. This has been supported by my first year’s harvest that I recently completed. I harvested my first crop approximately three months earlier than other growers farther up into the Harbor and I had a survival rate of 70%, 10% higher than that defined by the USDA Risk Management Agency as an anticipated survival rate under normal culture operations in Massachusetts. Both of these factors makes Biff’s more competitive with a higher rate of harvest relative to my initial plantings (i.e. more product translates to more profit) and an early harvest can get them to market considerably sooner than other growers.

In addition to higher productivity, I have negotiated a more secure business position through the use of a contract purchase price with a local shellfish wholesaler. Many local farmers do not have the guaranteed market as they chose to move from dealer to dealer to try to secure the best price. A lack of a secure market can leave those producers with weak or no markets during those times of the year when clam prices are low and demand is off.

As stated above, demand for quahogs is steady and the wild fishery is declining somewhat, see graph of quahog landings in MA. The only remaining source of hard clams will be those cultured in farm sites. Therefore, it is generally accepted that the market for farmed clams will be increasing as a result of declining wild catches and as
new markets are being opened up in the mid-western area of the United States, reference to Boyd study discussed above. In addition, there is a great potential for a European market opening for quahogs as more effort by private shellfish growers is expended in developing those markets. This is particularly true as the European oyster, the staple of the shellfish raw bar in Europe, becomes more limited due to loss of clean habitat for culturing the oyster in the Brittany region of France and in Belgium. Disease is also impacting the European shellfish supply as both the cultured European oyster and the cultured Manila clam stocks are decreasing because of bonamiasis and brown ring disease, respectively.

As is clear from the above, marketing, in the sense of identifying and finding customers is currently not an issue for Biff's. However, Mr. Bivalve is aware that the business world is not a static entity and is prepared to explore alternative distribution channels, within Biff's means, and in an orderly fashion. These markets/marketing issues are addressed in the Strategy for Growth section.
Operations and Management

**Biff's Best Quahogs** is a sole proprietorship business and is owned and operated solely by Mr. Bivalve, on a part-time basis at this point in time. Mr. Bivalve is a 35 year old male who is in good health and has been a carpenter for 15 years. He has worked as an independent contractor, managing my own business, and as an employee for a larger construction firm. Mr. Bivalve has worked alone and has directly supervised a staff of five carpenters. He has also managed many house construction projects as the general contractor.

Mr. Bivalve is currently able to maintain the clam farm while working a full-time job as a carpenter for ABC Construction Company (Overshoe, MA). Mr. Bivalve's technical expertise is a result of experimenting with growing quahogs for the past five years, using a small plot near my property in Overshoe. He has also worked closely with the Southeast Massachusetts Aquaculture Center at Buzzard's Bay and has received technical assistance from the Southeastern Massachusetts Agricultural Partnership. Both of these entities partner with the Massachusetts Department of Food and Agriculture and County Extension Offices. All of these organizations provide on-site technical resources as well as access to formal agricultural and aquaculture technical and business research.

Mr. Bivalve formally purchased seed clams and grew his first crop with harvest during the fall of 1999. The crop demonstrated a 72% survival rate, which is a level of survival that is 10% higher than has been defined as average by the USDA Risk Management Agency Quahog Crop Insurance Program. This indicates that Mr. Bivalve's husbandry skills and growing site are better than average with respect to growing quahogs.

As the business grows, Mr. Bivalve intends to scale back his carpentry work as the needs of the clam farming business and the subsequent profits increase. This will be done by finishing with ABC Construction in April of 2001, aligning small contract jobs independently during the following two years and converting to full time clam farming during this interval.

Management of the business is the responsibility of Mr. Bivalve. Mr. Bivalve currently maintains his own books as has been the case through many years of independent contracting. Mr. Bivalve anticipates hiring an accounting firm to assist with these tasks as he develops the business.
As the business expands, BBQ will need to hire part-time employees to complete the work necessary if BBQ plants greater than 500,000 clams per year. Therefore I have projected my initial business plan based on an upper limit of 500,000 clams planted per year. When I decide to expand beyond the 500,000 threshold I will need to hire one or two employees, based on the planting schedule. It is anticipated that these employees will be seasonal workers hired in May, who have the primary responsibility of maintaining the nursery upwellers and maintaining the grow-out nets currently deployed in the field. I will be responsible for training the new employees. They will be kept on the job until the fall planting is completed at the end of October of the same year. I plan to use college students from the local community college and student interns from two local schools to fulfill his part-time employment needs. I anticipate paying them $15 per hour and will include workman’s compensation.
Strategy for Growth

Given the 500,000 clam threshold explained above, I have developed the business plan to project my transition to full time clam farmer over the next six years. As stated above, the purpose of the plan is to analyze and assess this strategy financially and operationally (Can I accomplish these goals with the labor assumed?) relative to my transition to full time clam farmer.

My goal is to rely on Biff's Best Quahogs as my sole source of income within the next five years and, through this business plan, I will test the feasibility of expanding my business to undertake an annual planting of 2,000,000 clam seed. This expansion will require me to hire, initially one part-time employee, and eventually two part-time employees while providing a full-time income for me (starting in 2003). In order for me to make this expansion cost effective, I intend to purchase my clam seed at a lower cost and grow them through the nursery phase (1mm to 15mm valve length) using my own nursery facility. The impetus to expand the business was derived from the development of a Pilot Crop Insurance Program for Quahogs, developed by the USDA Risk Management Agency. The presence of a crop insurance program enables me to access potential bank financing that was not available to clam growers in the past.
Application and Expected Effect of New Capital

In order to complete a large-scale expansion, a business loan will need to be secured by me. It is anticipated that a small business loan of $35,000 (Thirty-five-thousand Dollars) will provide the core capital (equipment and limited operating costs) to accomplish the objectives outlined in this Business Plan. The shortfall indicated in 2001 and 2002 will be covered by personal savings. It is proposed that the loan be structured in a way to allow the principal repayment to be deferred until the results of the increased production is realized, as the clam crop does not reach a market size until 2 – 2.5 years after planting. Therefore, I propose to maintain payments on the interest accrued during the life of the loan but defer payment of the principal until 1 October 2003. At that time, Mr. Bivalve will initiate monthly payments for a time span of two years to repay the loan.

It is anticipated that for Biff's Best Quahogs to expand during 2002 it will require an upweller nursery system and a stainless steel roller clam sorter, both placed at 28 Tideflat Lane. The small business loan of $35,000 described above will provide for the equipment, construction to expand the capacity of Biff's to grow clams and for minimal operating expenses during the first year of expansion.

The upweller nursery will cost about $9,000 to construct and will have a capacity of 2.5 million - 15mm quahogs. The design is an axial flow type design based on plans developed by the Harbor Branch Oceanographic Institute – Aquaculture Division and will be constructed by Mr. Bivalve. The overall system design is two floating/submersible barges that are each powered by a 3/4 horsepower axial flow pump. The barge hull will be twenty feet long and ten feet wide with built in flotation. Within each barge will be twenty upweller silos (24 x 18 inches) each with a capacity of approximately 60,000 seed at 15mm. Water flow through each silo will be 25 gallons per minute. The upwellers will be maintained at the dock associated with the facility at 28 Tideflat Lane.

The clam sorter is a commercially available unit that is routinely used by companies in the clam industry. It will be purchased from Acme Machine Corporation (Cranston, RI) for approximately $15,000. The sorter will be installed, by Acme Machine, in the building at 28 Tideflat Lane and will be used primarily to grade the clams grown by Biff's Best Quahogs. In addition it will be available for other clam growers to use, for a fee, to sort their clams.
Finally, based on projected operating expenses, Biff’s will require approximately $11,000 during the first year of expanded operations to cover costs associated with hiring an employee to assist with the work.

The loan required to purchase the items described above must be for $35,000. In order for Biff’s Best Quahogs to secure this loan it will be necessary to have the following conditions:

1. The funds must be available by June 2002
2. The total amount must be $35,000
   (i) $9,000 for axial flow upweller construction
   (ii) $15,000 for purchasing a clam grader
   (iii) $11,000 to cover core operating expenses during year 1.
3. The payment schedule must be
   (i) Payment only on interest owed – May 2002 to October 2004
   (ii) Payment on principal starts in November 2004 and continues for two years.
   (iii) Final payment will be October 2006.
Financial Data

1. Balance Sheet as of May 31, 2001

2. Revenue and Expense Assumptions
3. Revenue and Expense Projections (Cash based) for 2001-2006 applying different capital investment assumptions.
Balance Sheet
Assumptions
Appendices

Appendix One - Chronology of the development of Biff's Best Quahogs from start-up to present.

September 1996 - Started investigating details of quahog farming in Overshoe Harbor.

3 November 1996 - Met with Town of Overshoe - Division of Natural Resources to discuss possible location of site for clam farm.

8 November 1996 - Explored sites within harbor as suggested by Overshoe Shellfish Biologist – selected site in Boot Hill region of Quid pro quo in Overshoe Harbor.

12 November 1996 - Formally applied to Town of Overshoe for shellfish aquaculture license with site location on Boot Hill Flats.

3 January 1997 - Public hearing with Overshoe Board of Selectmen to discuss application for shellfish aquaculture license – received preliminary approval of application. Application forwarded to Massachusetts Division of Marine Fisheries (Ma-DMF)

12 February 1997 - Site survey conducted by Ma-DMF – no significant natural resources observed at site therefore approved by Ma-DMF. Application forwarded to US Army Corps of Engineers (US-ACOE).

15 February 1997 - Ordered 100,000 field plant size (15mm valve length) from Nonesuch Shellfish Hatchery, Scarborough, ME to be delivered by 15 September 1997.

28 February 1997 - Application approved by US-ACOE. Returned to Town of Overshoe for final approval.

15 March 1997 - Overshoe Board f Selectmen gives final approval to application and awards a five year license with option to renew.

30 March 1997 - Received Shellfish Propagation License from Ma-DMF.
1 August 1997 - Ordered netting and other supplies from Coastal Aquaculture Supply, Cranston, RI.

8 August 1997 - Received culture supplies and started constructing anti-predator nets for farming quahogs.

14 September 1997 - Received 100,000 field plant quahogs from hatchery and planted them at culture site under four 10x50 foot raceways. Maintained until water temperature dropped below 10°C.

12 January 1998 - Ordered 250,000 field plant size quahogs from Nonesuch Hatchery and 250,000 from Aquaculture Research Corporation (ARC, Dennis, MA).

19 March 1998 - Started summer maintenance schedule of planted quahogs. Maintained until water temperature dropped below 10°C in fall.

12 September 1998 - Received field plants from ARC and planted under 420 linear feet of raceway. Maintained until water temperature dropped below 10°C.

21 September 1998 - Received field plants from Nonesuch Hatchery and planted under 420 linear feet of raceway. Maintained until water temperature dropped below 10°C.

24 January 1999 - Ordered 250,000 field plant size quahogs from Nonesuch Hatchery and 250,000 from ARC.

12 March 1999 - Started summer maintenance schedule of planted quahogs. Maintained until water temperature dropped below 10°C in fall.

7 September 1999 - Start harvest of 1997 field plants.

25 September 1999 - Received field plants from ARC and planted under 420 linear feet of raceway. Maintained until water temperature dropped below 10°C.

26 September 1999 - Received field plants from Nonesuch Hatchery and planted under 420 linear feet of raceway. Maintained until water temperature dropped below 10°C.
December 1999 - Finish harvest of 1997 plants (70% return).

16 January 2000 - Ordered 250,000 field plant size quahogs from Nonesuch Hatchery and 250,000 from ARC.
Appendix Two - A description of the process of growing clams.

The overall procedure for farming clams is to purchase small “seed” clams from a commercial shellfish hatchery. The size of the clam seed purchased is dependent on the capabilities of the farm. Traditionally, the starting clam farmer purchases “field plant” sized clams in the fall. Field plant size clams are approximately 15mm in shell length and the term describes the size of the juvenile clam that can be planted into the intertidal or subtidal flats at a final grow-out planting density of approximately 75 per ft$^2$. Field planting for the final grow-out phase of clam farming is accomplished by placing the clams on a prepared area where the sediment has been cleared of potential predators and the soil turned over to soften the bottom. The clams are planted in a raceway configuration that is approximately 12 feet wide, defined by the width of the netting available, and any length desired by the farmer, usually 50 to 100 feet. The netting is laid over the clams and secured along the edges by either wooden boards buried in the sediment or by burying the edge of the netting into the flats (approximately 8 inches) after reinforcing it with leaded line or steel rebar. A grower can plant approximately 200 feet of raceway during a normal low tide interval.

Maintenance of the clam farm consists of keeping the netting clear of biofouling or replacing the nets as the fouling interferes with the circulation of seawater under the netting and across the clams. In addition the netting is continually surveyed for tears and other means by which mobile predators, such as crabs and snails, can enter the raceway and consume the small clams. Net maintenance is primarily a warm water procedure and is reduced in the winter when the water temperature drops below 5-10°C as the growth of the fouling decreases as does the activity of the predators below these temperatures. A grower must clean each net about every two weeks during the warmest water period and less than that with lower water temperatures. It takes approximately one tidal cycle to clean 200 feet of nets.

The marketable clams are generally harvested 2 – 2.5 years following field planting, where the time interval is dependent on ambient environmental conditions such as average water temperature and food concentration. To harvest, the clams are dug by hand, using a “jerk” rake or basket rake, then washed and graded according to size. Those clams less than 1 inch width at the hinge are sub-legal and are replanted on the farm. Clams greater than 1 inch at the hinge are sorted into littlenecks (2 to 2.5 inches in length) and top necks (2.5 to 3 inches in length). They are sold to a clam wholesaler who markets them to their regular customers. The time required to harvest approximately 50 feet of raceway is about one tidal cycle.
Appendix C

Boyd’s market study