AQUACULTURE SMALL BUSINESS STARTUP KIT

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AQUACULTURE SMALL BUSINESS STARTUP KIT

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I. Starting a New Aquaculture Venture: Doing Your Homework

In this new era of renewed entrepreneurship and as producers receive less and less of the consumer's dollar many of you are taking that uncertain but rewarding step toward starting a new venture. Many producers in Indiana are starting specialty food businesses, becoming members of new generation cooperatives, or becoming direct marketers of their products. The purpose of this publication is to help you through the first steps of starting an aquaculture business.

Research the Industry

What do you know about producing fish? The first step to starting a new aquaculture business is to research the industry. Research means finding information that will give you a better perspective on the industry, your product's place within the industry, and your potential competitors. Your research should provide you with enough information to be able to do a preliminary analysis of your potential customers and competitors. This research will also give you a good start on your business and marketing plans.

There are many ways to access information to do your preliminary customer and competitor analysis. A good way to find some general information is via the internet, aquaculture associations, and aquaculture magazines. Aquaculture associations are not only a great way to find information about the industry but also a wonderful way to meet people who are producing fish. The associations are a way to make contacts that will allow you to visit their establishment so that you can find out what some of your needs are if you decide to produce fish. The Indiana Aquaculture Association (www.aquanic.org/iaa/) conducts several workshops during the year which you could attend to get information regarding latest techniques and trends in the industry. You could also contact your Purdue County Extension Educator and the Purdue Extension Aquaculture Specialist who have extensive sources of information.

Research the Market

The first step before placing any aquaculture product in the marketplace is to determine if there is a market for your product. A market is defined as all the potential buyers of your product. However, consumer interest alone does not make a market. The potential buyers must not only be interested in buying the product but also have the ability to pay for the product (i.e. you're asking price) and have access to the product. You will need to determine how big that market is and what segments of the population make up that market. You will need to take an intimate look at your business and identify the internal and external factors that could be characterized as strengths, weaknesses, opportunities, and threats.

Preliminary Product and Consumer Analysis

You will need to answer the following question:

- What will the product accomplish that is lacking presently?" Understanding the hole in the market that your product will fill is imperative to being able to turn a profit and have long term success. A hole in the market would be if there was a demand for a fish product from a growing segment of the population in your area that is not being met by local producers. If

you were able to produce and market that product to that target segment, you would be filling the hole in the market.

- How is my product different from existing products in the marketplace? In order for your product to succeed it must provide something to your target customer that is not being provided by an existing product, such as convenience, quality, price and/or a feels good factor. A feel good factor could be a product attribute that makes the customer feel good when he/she buys it, e.g., a person might buy fish from a local producer because it makes them feel more connected to where their food is coming from and they feel better about themselves for buying from local producers.
- Will the product be sold directly to the end consumer or will it be sold through a retailer? The answer to this question requires information about the customer. If the product is going to be sold directly to the end consumer then information about demographics and lifestyle are important. The marketing strategies that will be used will be different depending on the customer you want to attract. A fifty year old grandmother is a different customer than a thirty year old mother. Although, both are women and mothers their need for certain products are different because their lifestyles are different. It is also important to know how the customer will get information about the product and how customers will purchase the product. In other words, how will the product be advertised and sold.
- How much will it cost to start this business? What are the equipment and raw materials requirements? It is just as important to identify the product's potential suppliers. Again, aquaculture associations and magazines are a great way to find information on who is supplying the inputs for your product and how much those inputs cost. This is a great way to find out some of the preliminary capital costs for your business. These are costs that will come out of your initial investment and will not be recouped until your business turns a profit.

Preliminary Competitor Analysis

Understanding who your competitors are is imperative, since it will also give you information on the structure of the market. You should know how many businesses are selling the same or a similar product in the market you wish to serve. You should determine if there is room for more competitors. Especially in a rural area, you want to make sure you know who your potential competitors will be. There is nothing that can stop your business from developing faster than dipping into the pocket of one of your neighbors.

If there is room for more competitors determine why. Is the market large and therefore, not all of the market is being served. If so, determine if the businesses already in place are increasing capacity.

During this preliminary competitor analysis you should determine what the competitors' costs are. In other words, begin to get an idea of how much they are paying for juveniles/fingerlings, feed, transportation, and labor. Determine the type of infrastructure (space and utilities) required for the business. You should also research what types of licenses and permits are required at the federal, state, and local level.

What are your competitor's strengths and weaknesses? Can you take advantage of your competitor's weaknesses? Can you avoid your competitor's pitfalls? What are the strategies

pursued by your competitors? Which would you change and which will you integrate into your business. These are some of the questions that you should start to think about during this first stage of business development.

Suggested Readings

Baker Gregory A., Orlen Grunewald, and William D. Gorman. *Introduction to Food and Agribusiness Management*. Prentice Hall: Upper Saddle River, New Jersey 2002.

Iowa State University Extension. *Steps to Ag Business Development.* *WWW.iowaagopportunity.org*

Rogak, Lisa. *The Complete Country Business Guide*: *Everything You Need To Know To Become A Rural Entrepeneur.* Williams Hill Publishing: Grafton, New Hampshire 1999.

Rowe, R. Barbara and Alma J. Owen. "Getting Started" *Working for Yourself.* Purdue University Cooperative Extension Service.

Small Business Administration. *Starting Your Business-Your First Steps.* http://www.sba.gov

Activity Worksheet: Self Assessment

Now that you've done some preliminary research on the industry, you should take the time to evaluate your finances, business goals, and risk tolerance. There are many questions that you should ask yourself before embarking on a new aquaculture venture. How you answer those questions will give you an indication of whether or not you are ready to start this new business.

1. How much are you willing to invest?

   _____

   _____

2. Can you afford to **not** make a profit from your aquaculture venture for two or three years?

   _____

   _____

3. Does the business require a substantial upfront investment and do you have enough capital to be the sole owner or will you need to find investors?

   _____

   _____

4. Do you want to work full-time or part-time?

   _____

   _____

5. What are your hopes and aspirations for the business? Where do you see yourself in two years, five years, and ten years? Do you see your business expanding? If so, do you have enough capital and infrastructure to do so?

   _____

   _____

   _____

6. Can you deal with the stress of starting a new business? How well can you deal with risk? You should ask yourself how much time, financial, and emotional investment you want to put into this business and how much are you willing to lose.

_____

_____

_____

7. Are you prepared to work long, irregular hours and to on call 24 hours a day?

_____

_____

_____

These are questions that should give you some insight into how prepared you are for this business venture. There are several sources listed above that have more detailed self assessment tests.

Activity Worksheet: Doing Your Homework

1. Why do you think that this is something you would like to do?

   _____

   _____

2. How do you intend to do this business?

   A. Hobby? B. Part time (supplemental) job? C. Full time career?

3. What kind of labor is available for this business? Indicate if fulltime (FT) or Partime (PT)

   A. Self? B. Family and friends? C. Hired hands?

4. What fish species do you want to grow and why?

   _____

5. How much investment do you want to put in this?

   _____

   _____

6. How much profit do you expect from your investment?

   _____

   _____

7. What type of production systems will you be using?

   A. Cage B. Pond C. Indoor Tanks

8. Do you have experience growing aquatic animals? If 'No' do you intend to learn how to grow aquatic animals?

   _____

9. What is your water source?

   A. Well B. Stream/Creek C. Rain

10. What market coverage are you looking at?

    A. Local/County B. State/Regional C. National

11. In what form will you sell your products?

A. Live B. Whole on ice C. Processed

12. How will your product get to market?

A. On-farm sales B. Will deliver to retailers C. Sell to Wholesaler/Distributor

II. Why Start an Aquaculture Business?

Starting a successful aquaculture business requires a lot of thought and time before even a cent is spent. Many people worry about whether they have a market for their product of service, but do not put a lot of thought into how this new business will fit with their current lifestyle or with the goal they have for their future. This chapter is designed to help you determine how a new aquaculture venture will fit with your personal and business goals.

> *Example – The Fish Farm*
> Robert loves to raise fish as a hobby and occasionally makes money on the side from it. Several of his friends and neighbors routinely ask him to sell them fish, so Robert is thinking about starting an aquaculture business. He is very busy with his job on the family's hog farm and other activities, and knows that if he starts a fish farm he might not be able to manage other responsibilities or be as active in the family farm. However, he feels that owning his own business while doing something he really loves will not only fulfill his dreams but also provide his family with some extra income.

Why are goals important?

Begin by determining the reasons you want to start an aquaculture business. Do you want to make a lot of money? Do you want to be your own boss? Do you simply want to provide a job for yourself or someone in your family? Think about your life as a business owner and manager, taking into account all aspects of your life. What benefits will you derive from the business? What are the impacts to your lifestyle? In other words, how will starting and managing a new aquaculture business affect your present job and personal life? Your reasons for starting a business will help guide your plan for starting and growing your business.

You must think about how big you want the business to become. This is important because one of the reasons businesses fail is uncontrolled growth. Consider whether you want the business to remain small or grow enough to challenge a larger competitor. Is your goal to receive a profit commensurate with your effort and investment, or is it to receive as much profit as possible?

Setting goals and objectives

While goals can be broad or general in nature, objectives should be clear and concise. Goals do not have to be specific enough for you to act on, but should give you a future target or list of things you want to work on. Objective, however, need to be SMART—specific, measurable, action-oriented, realistic, and timely—to accomplish the goals you set for your business.

> *Example – The Fish Farm Goal and Objectives*
> Robert's goal is to start a fish farm specializing in yellow perch within the next 6 to 12 months. Robert's first objective is to write a business plan within the next 3 months. Robert's second objective is to contact an attorney, realtor, and his bankers for technical assistance as he starts his business in the next 6 to 12 months. His third objective is to have $10,000 in sales his first year of business.

Action Plans

Once you have identified your objectives, the next step is to break each objective down into action plans, or all the steps necessary to achieve that objective. Think of action plans as small, manageable projects. Make sure the action plans are small enough that they can be accomplished in a few days or a month at most. Work on the most timely goals and objectives first, breaking them down into monthly action plans. Breaking down each objective into action plans will help you make the daunting task of starting a new aquaculture business manageable and less stressful.

Example – The Fish Farm Action Plan

Robert has decided to break down his first objective, the business plan, into manageable action plans. Some of his action plans for the first month are:

1. Assess his strengths and weaknesses.
2. Write a vision and mission statement.
3. Identify potential customer attributes.
4. Identify the target market.
5. Determine market potential.
6. Identify and assess fish farms in the area.
7. Research the industry.

Starting an aquaculture business takes thought and planning. Understanding the reasons you want to start an aquaculture business and setting goals are essential to your success. Breaking this process into three steps (goals, objectives, action plans) will make it less daunting and more manageable.

Suggested Readings

Scarborough, N.M. and T.W. Zimmer. 2002. *Effective Small Business Management: An Entrepreneurial Approach.* Upper Saddle River, NJ: Prentice Hall.

Lesonsky, R. ed. 2004. *Start Your Own Business: The Only Start-up Book You'll Ever Need*, 3rd ed. Canada: Entrepreneur Media, Inc.

Turner, M.L. 1999. *The Unofficial Guide™ to Starting a Small Business*. New York, NY: Hungry Minds, Inc.

Activity Worksheet: Goals and Objectives

1. Write down a series of personal and business goals.

_____
_____
_____
_____
_____

2. Write down objectives for the next year. Break down goals into 'SMART' objectives—specific, measurable, action-oriented, realistic, and timely.

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

3. Write down some action plans for the objective above.

_____
_____
_____
_____
_____
_____
_____

III. Fundamentals of the Business Plan

One of the most important things you can do when starting a business is writing a business plan. A business plan is an evaluation of your business' chance of success. It is a game plan for managing a business successfully and a tool for comparing your actual and targeted results. Lastly, it is a requirement for a small business loan. However, the real value of writing a business plan is in the process of creating it. Research has shown that those who go through the process of writing a business plan are more likely to start their business than those who don't go through the process. In the end, a business plan is a written summary of your proposed aquaculture business.

Executive Summary

The executive summary is the first section of the business plan you see but the last one you write. It is a summary of all the relevant parts of the business. It should be written in lay language without industry jargon. In other words, anyone should be able to understand the entire business concept and your competitive advantage. You should consider it your "elevator pitch" and it should therefore be no longer than 2 pages.

Mission Statement

The mission statement is the second section of the business plan. Here you would write your vision of what the company is; what it is to become; and what it stands for. It is the broadest expression of a company's purpose and defines the direction in which it will move. A mission statement is generally a paragraph of approximately 3 to 5 sentences.

Business and Industry Profile

The business and industry profile is the third section of the business plan. Here you explicitly write out your goals and objectives. You also provide an industry analysis that demonstrates your knowledge of the industry and what trends make it possible for you to enter the market. You should provide information on the existing and anticipated profitability of competing firms.

You may also want to provide a competitor analysis by doing the following:

- Provide information on competitors' market shares, products, and strategies
- Demonstrate that your company has an advantage over its competitors
- Provide a strengths, weaknesses, opportunities, and threats (SWOT) analysis

Another part of this section is the business strategy, where you explain how you plan to gain a competitive advantage in the market and what sets your business apart from the competition. You should also demonstrate how you plan to meet goals and objectives in the face of competition and government regulations. This section also includes the image that your business will project and promote.

Marketing Strategy
The fourth section of the business plan is the marketing strategy which includes a description of your product and the services that you provide. When you write the description of the product, you should focus on customer benefits and not just a detailed list of the product's features. This is a way to differentiate your business.

In this section you should provide proof that a profitable market exists. Demonstrate customer interest: prove that the target customers need or want the product and are willing and able to pay for it.

Plan of Operation
The plan of operation is the fifth section of the business plan. Here you should construct an organizational chart with key personnel. This shows that you have the right people organized in the right way. Describe the firm's form of ownership and any leases, contracts, and other relevant agreements pertaining to the operation. You should also include resumes for anyone with at least a 20% ownership in the business.

Financial Plan
The sixth section of the business plan is the financial plan. The financial plan should include monthly pro forma financial statements for one year and by quarter for each of the next 2-3 years for the following three statements:

- Income statement
- Cash flow statement
- Balance sheet

You should include three sets of forecasts: optimistic, most likely, and pessimistic. You should also include a break-even analysis as part of your financial plan. Your financial plan ought to reflect your ability to repay loans to lenders and to produce adequate returns for investors.

Request for Funds
The last section of the business plan is the request for funds if this is written for a bank loan or as an investment opportunity. You should state the purpose of the loan or investment, the amount requested, and the plans for repayment or cash-out.

A business plan can seem overwhelming. However, remember that the process is more important than the written word. The important part to remember about the process is that it is iterative. In other words, all the parts inform each other.

Use INVenture to write your business plan. It can be found at www.agecon.purdue.edu/planner. It is a web-based software program that assists you in evaluating your new business. It provides

self-motivated feedback progressively over a series of stages. Each stage represents a section of the business plan that should be analyzed in order to accept or reject your proposed aquaculture business.

Activity Worksheet: SWOT Analysis

An important part of doing your homework is doing a SWOT analysis. SWOT stands for Strengths, Weaknesses, Opportunities, and Threats. A SWOT analysis provides you a great opportunity to assess your competitive advantage and survey aquaculture industry to see how you fit in.

Strengths and weaknesses are things that are internal to your aquaculture business. For example, having several years experience of running a recreational fishing business that would be a strength. However, if you have limited knowledge of marketing, that may be a weakness.

Strengths	Weaknesses
Example: several years of experience	Example: no marketing experience

Opportunities and threats are things that are external to your business. In other words, these are things that you cannot change yourself. For example, increasing ethnic populations could be an opportunity and increasing federal or state environmental regulations could be a threat.

Opportunities	Threats
Example: increasing ethnic population	Example: increasing environmental regulations

IV. Understanding Your Market

In starting a new aquaculture business, you must decide if the venture at hand is worth the effort involved. One crucial step in the start-up process and the business plan is understanding the specific product needs of the customers targeted by the business. By segmenting the market, you can find niches that give you a marketing edge over competitors.

Undifferentiated versus Differentiated Marketing
There are essentially two basic approaches to marketing—undifferentiated and differentiated. Undifferentiated marketing treats the market as a whole, rather than as individual groups. Such tactics focus on the common needs of the entire market, rather than the differences in groups within the market. This approach relies heavily on mass marketing and is implemented on the basis of cost savings to the business. It is generally more successful when the product has mass appeal or when there are virtually no competitors.

Differentiated marketing considers segments within the market, often working to build loyalty and encouraging repeat purchases through the consideration of specific customer needs and preferences. Differentiation through target marketing can create increased total sales since marketing efforts are concentrated in specific areas, and can also decrease the cost of production, distribution, and promotion. However, differentiated marketing is not without risk. There is always chance of a change in preferences by the segment or that a competitor will enter the same segment. If you have processed or value-added fish products this approach of marketing may be appropriate.

Market Segments
Market segmentation occurs when a business identifies the potential buyers within a market who have similar needs, show similar buyer behavior, and are expected to be the most receptive to the product. In order to determine the process a respective customer goes through to purchase and use the product, you must understand how the target market will use the product. It is very important to determine whether potential customers come from the consumer or business market. For example, most fish farmers in Indiana sell their fish to live ethnic markets. Asians, some Hispanics and Africans prefer to purchase live fish so these types of customers can be your target market. Consumer and business markets have very distinct needs. The following categories are some of the most common means by which consumer markets can be segmented.

Geography – Are your customers local, regional, national, or international?
Psychographics – Are there behavioral characteristics that differentiate the customers?
Socio-Cultural Factors – Are there cultural considerations, social connections, or other personal factors which might shape the customer's needs, wants, and behavioral patterns?
Demography – Are the customers old, young, male, female, low income, or high income?

Suppose you want to segment the live market within the fish retail business, the following questions would help to guide you to serve the customers in that market.

- *Industry* – Do the customers' needs differ across fish retail business?

- *Geography* – Do the customers in different regions (Asia, Africa, Latin America) have different needs?
- *Purchasing* – Who in the business is involved in purchasing live fish? Which factors influence their decisions? What is their background and knowledge with respect to live fish?
- *Company* – What are company buying policies and procedures, financial constraints and timing of purchases?

The following questions should be asked for each market segment, regardless of whether the business is in the consumer or business market:

- Is the segment viable? Can we profit from it? Who are the other suppliers of live fish?
- Is the segment accessible? How easy is it to get into this segment of the fish market?
- Is the segment measurable? Can we obtain realistic data to consider its potential, e.g., how much live fish is purchased per week or month?

After identifying the potential segments within the market you should look at a number of them before making a final decision on which to target. Chicago and many of the major towns within Indiana have fish retail markets and ethnic stores that sell live fish. It is important to pinpoint the benefits that the targeted customers are seeking, such as: quality, low price, convenience, availability, status, etc. You must ask questions such as:

- What are the features that are considered basic that all customers expect of the product and/or service?
- What are features of products and/or services in the industry that help customers differentiate between similar products and/or services?
- What are features of the products and/or services in the industry that energize customers to make immediate judgments about purchasing the product and/or service?
- What frustrates customers about the existing product and/or service choices?
- What key feature is missing from the existing product and/or service choices?

After determining the benefits sought from the product by the targeted customers, it is essential to design the product to meet those specific needs and preferences. Each target group will require a separate marketing plan to meet their needs and expectations of the product.

It is important to understand how the product can create value for the customer. The following four questions will help to determine if the product and/or service is indeed creating value.

- Will the product and/or service provide an economic gain for the customer?
- Will the product and /or service provide a better price-performance balance than current products and/or services?
- Will customers perceive a benefit from the product and/or service that current products and/or services don’t have?
- Will customers obtain emotional benefits from the product and/or service that other products don’t provide?

You can do the following to assist in segmenting your market in addition to understanding the segmentation categories listed above.

- Visit fish retail stores in some Indiana cities and Chicago, if possible.
- Contact other aquaculture farmers serving a similar market or key trade-end users.
- Watch what works for key competitors, borrowing the successful elements of their marketing strategy, while adding in other unique marketing techniques to ensure product differentiation.
- Read aquaculture trade and association publications, basic research publications, and government publications.

Aquaculture Marketing Scenarios

Marketing strategies differ depending on the species of fish. Largemouth bass, yellow perch, and hybrid striped bass have different customer markets, distribution systems and processing methods. The preferred marketing methods are listed below.

Largemouth Bass

- Live for pond stocking (recreational sport fishing)
- Live for the live fish retail markets, especially Asian stores

Yellow Perch

- Processed or value-added and sold to grocery wholesalers, food service distributors, or directly to the public
- Processed into whole-dressed fresh on ice, or filleted, fresh on ice, frozen, breaded

Hybrid Striped Bass

- Live for pond stocking (recreational sport fishing)
- Live for the live fish retail markets, especially Asian stores
- Processed or value-added and sold to grocery wholesalers, food service distributors, or directly to the public
- Processed into whole-dressed fresh on ice, or filleted, fresh on ice, frozen, breaded

Assessing Your Sales Potential

The first step in assessing sales potential is determining the potential market. The potential market is all the consumers who may be interested in the product. For example, for a largemouth bass business the potential market would include all the recreational sport fisheries in Indiana.

The second step in assessing sales potential is determining the available market. The available market includes all the consumers who are interested in the product, are willing and able to pay for the product, and have access to the product. This step requires you to breakdown the potential market by beginning to define your customer segments. You can further subset the market to those customers that you intend to target for a particular offer. This subset is called the target market. This requires you to further segment the market to understand the needs and preferences of your customers.

Once you have determined the target market, you can begin to calculate the estimated sales potential for your product. The next step is to find out the selling price or the revenue expected per customer. Finally, you may try to determine the share of the market you can obtain.

Example: Sales Potential for a Startup Aquaculture Business

Robert wants to start a food fish farm in Indiana. He has decided to concentrate on yellow perch in the Lake County since he knows that populations of the specie from commercial harvest are on the decline in the Great Lakes. From the 2000 census Robert also knows that there are 126,961 families living in Lake County. Statistics published in several trade magazines indicated that on average households spent $750 on fish consumption. He has decided to concentrate on selling to various society groups, religious groups, associations, caterers, restaurants and grocery stores in neighborhoods of Lake County where household incomes are over $100,000, since these households would have an interest in and income to afford high quality fish. From industry research Robert learns that there are no food fish farms in Lake County, but the area has a tradition of Friday night fish fries with yellow perch which leads him to believe that he might be able to sell his fish in the future.

Potential Market (number of households)	$126,961
Available market (households with income over $100,000)	18,848
Qualified available market (families with income over $100,000)	16,590
Average spent on fish consumption (per household)	$750

Sales potential = (qualified available market) * (household expenditure on fish consumption)
Sales potential = 16,590 * $750 = 12,442,500
Estimated market share = 4.5%
Estimated sales potential (per year) = $559,913

Activity Worksheet: Marketing Your Food Fish

1. What customers will you target?
    a. Wholesalers (i.e. fish brokers, grocery wholesalers)?
    b. Retailers (i.e. chain and independent grocers)?
    c. Food service (i.e. hospitality services, restaurants)?
    d. Retail customers?
    e. Sport fisheries?

2. What food fish will you offer?
    a. Largemouth bass?
    b. Yellow perch?
    c. Hybrid striped bass?
    d. Other?

3. What price range will you charge for your product?

    _____

    _____

    _____

4. How will your product be distributed?
    a. Live?
    b. On ice?
    c. Frozen?
    d. Processed (i.e. filleted, breaded, seasoned)?
    e. Transportation?

5. How will you promote your product?

    _____

    _____

    _____

V. A Case Study using Indiana MarketMaker

Finding a New Market for Yellow Perch

Robert Anderson is a fish farmer who would like to sell yellow perch to high-income Hispanic consumers. Robert thinks potential customers would be Hispanic households where income is in excess of $100,000. Robert wants to use Indiana MarketMaker at www.inmarketmaker.com to learn three things:

1.) Where are the highest concentrations of high-income Hispanic households?
2.) What are the names of the grocery stores that serve those high-income Hispanic neighborhoods and where are they located?
3.) What are the names of the restaurants that serve those high-income Hispanic neighborhoods and where are they located?

Step-by-step directions to select household data and to identify grocery stores and restaurants:

Where are the high concentrations of Hispanic households?

- From the **Begin Your Search** page, select **Find a Market.**

- In drop box, choose **Income by Race.**

- In drop box **Race**, choose **Hispanic**. In the drop box **Income**, select **Household income $100,000 and over**. In **Search By**, Robert will choose whether he wants to search in the **State/County** or **Multistate**. In **Search Location** Robert can choose to search statewide or by each county.

- A map of the county area will show the census data requested. The legend indicates the number of households in each census tract. The dark red color has the largest number of households for the selected census category, "Hispanic household income $100,000 and over".

- Robert wants to focus on the census tracts with the highest concentration of Hispanic households. He will **Zoom In** around the areas where these households are located by drawing a box around that area. (Hold down the left mouse button and draw a box.)

- Using the **Identify** button to the left of the map, Robert can click on a specific census tract within the map to collect census data.

What are the names of those grocery stores that serve those high-end Hispanic neighborhoods and where are they located?

- Robert chooses an area for a target market of grocery stores with high-income Hispanic consumers from the demographic search results. To search for grocers, Robert clicks on the **Find Business** tab located to the right of the map in the grey tab. In the **Select Category** drop down box, he selects **Retailers: Food**. In the box that appears under the category, he selects **Grocers**. He then clicks on **Search Food Retail**. The speed of the grocery store mapping will depend on the number of grocery stores in the chosen area.

- Once the grocery stores appear on the map, Robert has two options. He can identify individual grocery stores by using the **Identify** tool. He can click on any grocery store marker to receive information on that store. Below the map, the name and address appear. In addition to the grocery store, there will be census data that refers to the census tract that the grocery store resides. Within the same area, Robert can find out more about the specific store by clicking on **Detail** which provides information about a business that includes the name, address, telephone number, website address, sales volume, number of employees, business type and industry classification.

- The results of the search should appear in a table below the map. If not, click on **View Results** tab to the right of the map. A results page will appear below the map listing all of the grocery stores in the area of the map. Within the search results, **MapIt/Detail** is for the individual record in that row. Robert can click on **MapIt** and MarketMaker will map only the individual record. If he wants additional information on a particular grocery store, Robert can click on **Detail** within that individual record.

- Robert has decided to contact a small grocer to market his fish. Even though there are larger ones in the same area, Robert realizes he cannot supply them with the amount of product they need and he will not have as much control on the price of his product.

What are the names of the fish markets that serve those high-end Hispanic neighborhoods and where are they located?

- Robert chooses an area for a target market of fish markets with high-income Hispanic consumers from the demographic search results. To search for fish markets, again Robert clicks on the **Find Business** tab located to the right of the map in the grey tab. In the **Select Category** drop down box, he selects **Retailer**. In the box that appears under the category, **Line of Business**, he selects **Meat and Fish Markets**. He then can search by city, county, statewide, or multistate. The speed of the meat and fish market mapping will depend on the number of markets in the chosen area.

- The results of the search should appear in a table. Within the search results, **MapIt/Detail** is for the individual record in that row. Robert can click on **MapIt** and MarketMaker will map only the individual record. He also has the option to map all of the results using

Map All in red. If he wants additional information on a particular meat and fish market, Robert can click on **Detail** within that individual record.

- Once the meat and fish markets appear on the map, Robert has two options. He can identify individual market by using the **Identify** tool. He can click on any market marker to receive information on that location. Below the map, the name and address appears. In addition to the market, there will be census data that refers to the census tract that the market resides. Within the same area, Robert can find out more about the specific store by clicking on **Detail** which provides information about a business that includes the name, address, telephone number, website address, sales volume, number of employees, business type and industry classification.
- Robert has also decided to contact a small meat and fish market to sell his fish. Again, Robert realizes he cannot supply them with the amount of product they need and he will not have as much control on the price of his product.

VI. Aquaculture Production Methods

The production method used in aquaculture depends on the type of the water-holding facility in which the fish are grown. Water-holding facilities are classified into pond culture, cage culture, raceway culture, and water recirculating systems. Not all fish grow well in all of these facilities; some do better than others in particular facilities. The table below provides a list of species suitable for commercial culture in Indiana and the common production system used.

Species	Market Product	Common Production System
Bluegill (*Lepomis spp*)	Sport Fish, Foodfish	Ponds, Recirculating system
Channel Catfish (*Ictalurus punctatus*)	Sport Fish, Foodfish	Ponds, Cages
Fathead minnows (*Pimephales promelas*)	Bait fish	Ponds, Recirculating system
Freshwater Prawn (*Macrobrachium rosenbergii*)	Foodfish	Ponds
Goldfish (*Carassius auratus*)	Ornamental fish, Bait fish	Ponds, Recirculating system
Golden Shiner (*Notemignus crysoleucas*)	Bait fish	Ponds, Recirculating system
Hybrid Striped Bass (*Morone saxatilis* x *Morone chrysops*)	Sport Fish, Foodfish	Ponds, Cages, Recirculating system
Largemouth Bass (*Micropterus salmoides*)	Sport Fish, Foodfish	Ponds
Rainbow Trout (*Oncorhynchus mykiss*)	Sport Fish, Foodfish	Raceways/Flow-through system, Ponds, Cages
Smallmouth Bass (*Micropterus dolomieui*)	Sport Fish, Foodfish	Ponds
Tilapia (*Oreochromis spp*)	Foodfish	Ponds, Cages, Recirculating system
Walleye (*Stizostedium vitreum*)	Sport Fish, Foodfish	Ponds
Yellow Perch (*Perca flavescens*)	Sport Fish, Foodfish	Ponds, Recirculating system

Pond Culture

Ponds can be earthen ponds or concrete ponds, but most production in the US takes place in earthen ponds. Ponds vary in sizes and range from about a quarter acre to several acres. Fish production may take place in a farm pond or in specifically designed and constructed ponds for aquaculture. Though most farm ponds have fish growing in them, they may not be suitable for commercial aquaculture because, quite often, they do not have a drainage system, uncertain water quality, and uneven water depths. However, many farm ponds have been used to produce

fish in cages and in recreational or fee-fishing operations. Ponds specifically designed and constructed for fish culture require some amount of clay soils to retain water. When constructing ponds, ponds that are less than 2 acres are recommended because they are less difficult to manage than larger ones. For detailed information on pond construction, see:

1. USDA- NRCS - Natural Resources Conservation Service publication "Ponds - Planning, Design, Construction" (http://www.in.nrcs.usda.gov/pdf%20files/PONDS.PDF).

2. Southern Regional Aquaculture Center (SRAC) Publication SRAC 101, "Construction of Levee-Type Ponds for Fish Production" (http://srac.tamu.edu/).

Caged Culture

Cage culture involves producing fish in a floating cage in lakes or ponds, allowing water to flow freely between the fish and the pond or lake. Cage culture is similar to pond culture, except that fish are enclosed in cages and not swimming freely in the pond. One major advantage is the convenience of harvesting fish, especially where the pond or lake is too deep for seining. Cages vary in shape and size, and could be rectangular, square or round. The cage size depends on the size of the pond or lake, availability of aeration, and the method of harvest. Larger cages are difficult to handle during harvesting. Manufactured cages are commonly sold as 4x4 feet (diameter x depth) cylindrical cages, 4x4x4 feet and 8x8x4 feet (length x width x depth) square cages, and 8x4x4 feet and 12x6x4 feet rectangular cages. The cages must be placed in open areas of the pond or lake with at least two feet of water between the bottom of the cage and the pond bottom allowing adequate water circulation to supply needed oxygen in and around the cages. For detailed information on cage construction and culture, see:

1. North Central Regional Aquaculture (NCRAC) Publication Technical Bulletin #110 "Cage Culture of Fish in the North Central Region" (http://www.ncrac.org/Topics/tb110.htm).

2. Southern Regional Aquaculture Center (SRAC) publication SRAC 162, "Cage Culture: Cage Construction and Placement" (http://srac.tamu.edu/).

3. Southern Regional Aquaculture Center (SRAC) publication SRAC 163 "Cage Culture: Species Suitable for Cage Culture" (http://srac.tamu.edu/).

Raceways/Flow-through System

Culture systems where water moves or flows through channels at relatively high rates are commonly called raceways or flow-through systems. The channels can be ponds, in-ground or above ground tanks constructed with concrete, tile, brick, wood, etc., and are arranged in a series of terraced raceways to allow water to flow by gravity through each unit. The distinguishing feature of raceways from ponds is the flow though, so raceways generally require large volumes of good quality water to flow through the units. Water sources for raceways are normally obtained from a spring, creek or stream and channeled through the raceways using gravity. Water can be pumped back (recirculated) to flow through the units but this can result in a very expensive operation. The water flow through the raceways removes fish wastes from the units,

and at the same time is replenished with oxygen as the water spills into the next raceway along the terrace. Most raceway culture in the US occurs where there are high volumes of spring water for the production of coldwater species such as trout. For detailed information on raceways and flow-through systems, see:

1. Aquanic – Raceways (http://aquanic.org/beginer/systems/raceway.htm).

2. University of Florida – IFAS Extension publication FA020 "Raceway Production of Warm-Water Fish" (http://edis.ifas.ufl.edu/FA020).

Water Recirculating Systems

Simple recirculating systems for aquaculture production consist of (a) a tank for holding the fish, (b) a solid waste removal system for removing solid fish waste and uneaten feed, (c) a biofilter for removing dissolved toxic wastes, (d) an aerator to supply oxygen, and (e) a pump to recirculate the water. Other components can be added to recirculating systems to make them more efficient, but they also add additional complexity. Because the system involves recirculating the water used, relatively less water is needed for this type of culture system compared to pond culture or raceway/flow-through systems. Fish production requires attention to critical factors such as water temperature, concentrations of dissolved oxygen, un-ionized ammonia-nitrogen, nitrite concentration, pH, and alkalinity levels. Most recirculating systems are placed indoors to allow the producer to maintain control over these critical factors to ensure good water quality during the growing period. Recirculating aquaculture systems are capital intensive and require close monitoring of the growing conditions of the fish, but they also allow for year round control of growing conditions. Therefore, producers interested in this type of production system should begin on a small scale before expanding into a large-scale production systems. For detailed information on recirculating aquaculture systems (RAS), see:

1. Southern Regional Aquaculture Center (SRAC) Publication SRAC 451 "Recirculating Aquaculture Tank Production Systems: An Overview of Critical Considerations" (http://srac.tamu.edu/).

2. Southern Regional Aquaculture Center (SRAC) Publication SRAC 452 "Recirculating Aquaculture Tank Production Systems: Management of Recirculating Systems (http://srac.tamu.edu/).

3. Southern Regional Aquaculture Center (SRAC) Publication SRAC 453 "Recirculating Aquaculture Tank Production Systems: A Review of Component Options" (http://srac.tamu.edu/).

4. Southern Regional Aquaculture Center (SRAC) Publication SRAC 454 "Recirculating Aquaculture Tank Production Systems: Integrating Fish and Plant Culture" (http://srac.tamu.edu/).

VII. Income Statement

As part of an integrated system of financial statements, the income statement is valuable as both a planning and management tool to help control business operations during an accounting period that can be anything from a month to a year. The income statement indicates a firm's profitability. Monthly income projections can be calculated and then compared to the firm's actual income so that the manager can correct any problems. An example of an income statement is shown on the next page.

The first item on the income statement is net sales (gross sales minus returns). Net sales is followed by cost of goods sold. Cost of goods sold is only required if the firm is an intermediary such as a retail store or wholesaler. Cost of goods sold is equal to beginning inventory plus goods purchased minus ending inventory. Gross profit is the net sales minus the cost of goods sold. If the firm manufactures a product then the cost of goods sold would be equal to the beginning inventory plus goods manufactured minus ending inventory. However, most farming companies do not have a cost of goods sold section.

The next category on the income statement is the variable expenses. These are expenses directly related to the operation of the business that change from one accounting period to the next. The following items can be part of the variable expense category: wages, uncollectible accounts, and office supplies. The last category on the income statement is the fixed expenses such as rent, depreciation, loan payments, and utilities.

Total expenses (variable plus fixed) are then subtracted from gross profit to calculate net profit (loss) before taxes. The next step is to calculate the taxes that must be paid for the accounting period. Net profit (loss) is then calculated by subtracting taxes from net profit before taxes. If any part of the firm's profit is paid to investors then those are written in the dividends paid line. The remainder is then the undistributed earnings of the firm.

Company Name _____
For year ending _____, 20_____

Net Sales			_____
Cost of Goods Sold			
	Beginning Inventory	_____	
+	Goods Purchased	_____	
-	Ending Inventory	_____	
Cost of Goods Sold			_____
Gross Profit (Net Sales - Cost of Goods Sold)			_____
Variable Expenses			
	Salary/Wages	_____	
	Uncollectable Accounts	_____	
	Legal/Accounting	_____	
	Advertising	_____	
	Automobile	_____	
	Office supplies	_____	
	Interest	_____	
	Miscellaneous Expenses	_____	
	Total Variable Expenses		_____
Fixed Expenses			
	Rent	_____	
	Depreciation	_____	
	Utilities	_____	
	Insurance	_____	
	License/Permits	_____	
	Loan Payments	_____	
	Total Fixed Expenses		_____
Total Expenses			_____
Net Profit (Loss) before Taxes			_____
Taxes			_____
Net Profit (Loss) after Taxes			_____
Dividends Paid			_____
Undistributed Earnings			_____

VIII. Balance Sheet

As part of an integrated system of financial statements, the balance sheet is the financial statement that brings things into perspective. The statement of cash flows and the income statement are used to record the events between balance sheets. An example of a balance sheet is shown on the next page.

The balance sheet is grouped into three major categories. The assets of the firm or in other words, what the firm owns are listed first. The second category is the liabilities of the firm or what the firm owes. The final category listed on the balance sheet is the owner's equity or the owner's claim on the assets of the firm.

The asset category is divided into various subcategories listed in order of liquidity or how fast the asset can be converted into cash. It is the standard to have at least these three categories in the following order: (1) current assets; (2) fixed assets; and (3) intangible assets. Current assets are those assets that will be used within the current operating period, such as cash, accounts receivable, inventory, and prepaid expenses. Fixed assets are assets that will not be used within the current operating period such as land, buildings, and equipment. Accumulated depreciation is listed under the fixed asset category as a negative (hence the parentheses). Intangible assets are assets such as patents, trademarks, and copyrights. Total assets are the sum of the current, fixed, and intangible assets.

Although there are many methods of calculating depreciation the simplest method is straight-line depreciation. The Internal Revenue Service specifies the useful life of an asset. In other words, the IRS specifies for how long an asset can be depreciated. In general, office equipment and automobiles have a useful life of five years and machinery has a useful life of seven years. The salvage value of an asset is the expected value of that asset at the end of its useful life. Hence, the annual depreciation of an asset is calculated as follows:

$$\textbf{Depreciation} = \frac{\textbf{Initial cost of the asset} - \textbf{Salvage value of the asset}}{\textbf{Useful life of the asset}}$$

Liabilities are what the firm owes. Current liabilities are items that the firm must pay in the short term or current operating period such as accounts payable, interest payable, and wages. Taxes payable are what the firm must pay to the state and federal government and can include items such as state tax, self-employment tax, and sales tax. Long-term liabilities are liabilities that will not be due until after the current operating period such as mortgages or bonds. Notes payable are listed under the current and long term liability categories. Notes payable under the current liability category are items such as short term loans that are due in the current operating period. Notes payable under the long term liability category are loans that will not be due in the current operating period such as equipment purchased and financed through a manufacturer.

Owner equity denotes the owner's claim on the firm's assets. In other words, owner equity is an investor's initial investment in the firm. Undistributed earnings are also a part of the owner equity category and are the profits retained by the firm. The last line on the balance sheet is the sum of total liabilities and total owner equity. In order for the financial statement to balance the firm's assets must equal the firm's liabilities plus the owner equity.

Company Name _____
As of _____, 20___

Assets	
Current Assets	_____
Cash (all)	_____
Accounts Receivable	_____
Inventory	_____
Short-term Investments	_____
Prepaid Expenses	_____
Fixed Assets	
Land	_____
Building(s)	_____
Equipment	_____
Accumulated Depreciation (building & equipment)	( )
Intangible Assets	
Patents	_____
Trademarks	_____
Copyrights	
Total Assets	
Liabilities	
Current Liabilities	
Accounts Payable	_____
Notes Payables	_____
Interest Payable	_____
Payroll	_____
Dividend	_____
Taxes Payable	
Federal	_____
State	_____
Self-employment	_____
Sales	_____
Property	_____
Long Term Liabilities	
Mortgage	_____
Notes Payable	_____
Bonds Payable	_____
Total Liabilities	_____
Owner Equity	
Partner #1	_____
Partner #2	_____
Undistributed Earnings	_____
Total Owner Equity	_____
Total Liabilities + Total Owner Equity	

Notes:

Appendix. Startup Kit Budgets

I. Cage Culture
II. Pond Culture
III. Recirculating System

CAGE CULTURE

The budget presented below is a guide to assist you in projecting costs and returns for your aquaculture enterprise. It is to be used for planning your aquaculture operation and developing a budget specific to your situation.

You should change the cells in yellow with blue font to reflect your situation.

Choose the fish species from the drop down menu: **Hybrid Striped Bass**

Variables	Unit	Value	
Length of production	month	**18**	*time from fingerling to harvest*
Number of cycles/fish stockings in a year	#/yr	**2**	*no. of times you wish to harvest(stock)/year for continuous production*
Number of cages harvested per cycle	cages/cycle	**10**	*no. of cages you wish to harvest/stock at one time*
Total number of cages needed	cages	30	
Minimum water surface acreage needed	acres	7.2	*Based on max fish production of 5K lb/ac/year*
Cage Shape		**Rectangular**	*choose the cage size from the drop down menu*
Cage Dimensions			
	Diameter	**5**	
	Length	**10**	
	Width	**6**	
	Height	**6**	
Individual Cage Volume	gals	2,244	*volume is calculated allowing a foot above water surface*
Stocking density/cage	/cage	1,496	*stocking rate is calculated as a lb fish at market per gallon of water*
Fingerling size (5")	lb	**0.03**	*assumes 1,000 5"-fingerlings weigh 30lb*
Harvest size	lb	**1.5**	
Feed Conversion Ratio (FCR)		**1.5**	
Survival	%	**80%**	*% of fish that survives until harvest*

Gross Receipts:		$/unit	quantity / cycle	$/cycle	$/year
Fish sale	$/lb	**$ 2.75**	17,952	$ 49,368.00	$ 98,736.00
Miscellaneous Receipts	$/lb	**$ -**		$ -	
Total Receipts				**$ 49,368.00**	**$ 98,736.00**

Write down stocking months	**April**	**May**				

Variable Inputs:		$/unit	quantity / cycle	$/cycle	$/year	$/lb/yr	% of total cost	
Fingerlings	$	$ 0.45	14,960	$ 6,732.00	$ 13,464.00	$ 0.38	17%	
Feed	$/lb	$ 0.45	26,255	$ 11,814.66	$ 23,629.32	$ 0.66	30%	
Chemicals	$/cage	$ 5.00	50	$ 250.00	$ 500.00	$ 0.01	1%	
Electricity cost for aeration	$/kwh	$ 0.10	3,600	$ 360.00	$ 720.00	$ 0.02	1%	*assumes 24 hr continuous aeration from May-Sep*
Hired Labor - Hours	$/hr	$ 10.00	1,460	NA	$ 14,600.00	$ 0.41	19%	*assumes unpaid owner labor throughout production*
Harvesting	$/lb	$ 0.04	17,952	$ 718.08	$ 1,436.16	$ 0.04	2%	
Transportation Costs of Fingerlings	$/fish	$ 0.02	14,960	$ 299.20	$ 598.40	$ 0.02	1%	
Transportation Costs to Market	$/lb	$ -	17,952	$ -	$ -	$ -	0%	
Miscellaneous	$/cage	$ 10.00	100	$ 1,000.00	$ 2,000.00	$ 0.06	3%	
Other	$	$ -		$ -	$ -	$ -	0%	
Total Variable Cost				**$ 21,173.94**	**$ 56,947.88**	**$ 1.59**	**73%**	

Overhead Costs		$/unit	quantity / cycle	$/cycle	$/year	$/lb/yr	% of total cost	
Repair and Maintenance	$/lb	$ 0.01	17,952	$ 179.52	$ 359.04	$ 0.01	0%	
Water acres rental	$/acre	$ 250.00	7	NA	$ 1,795.20	$ 0.05	2%	*assumes a rental or opportunity cost for use of lake/large pond*
Insurance	$/yr	$ 1,000.00			$ 1,000.00	NA	1%	
Adminstration/Management - legal fees, professional services, etc.	% of TVC	5%	NA	$ 1,058.70	$ 2,847.39	$ 0.08	4%	*assumes a % of Total Variable Cost (TVC)*
Other 1	$	$ -				NA	0%	
Other 2	$	$ -				NA	0%	
Total Overhead Costs				**$ 1,238.22**	**$ 6,001.63**	**$ 0.17**	**8%**	

Annual capital costs calculation assumes a straight line depreciation
All capital costs are incurred beginning of year 1

Capital Costs		Cost	Number	Total cost	Yrs of use	Salvage value	Cost/year	Cost / cycle	% of total cost
Feeders	unit	$ 60.00	30	$ 1,800.00	5	$ -	$ 360.00	$ 180.00	0%
Storage Shed	unit	$ 4,000.00	1	$ 4,000.00	10	$ 400.00	$ 360.00	$ 180.00	0%
Electrical aerator (or air lifts)	unit	$ 1,250.00	7	$ 8,976.00	5	$ 897.60	$ 1,615.68	$ 807.84	2%
Emergency Generator	unit	$ 1,000.00	1	$ 1,000.00	10	$ 100.00	$ 90.00	$ 45.00	0%
Transport tank	unit	$ -	1	$ -	10	$ -	$ -	$ -	0%
Mower	unit	$ 500.00	1	$ 500.00	7	$ 50.00	$ 64.29	$ 32.14	0%
Misc (waders, scale, test equp)	unit	$ 2,000.00	1	$ 2,000.00	5	$ 200.00	$ 360.00	$ 180.00	0%
Cages	unit	$ 500.00	30	$ 15,000.00	5	$ 1,500.00	$ 2,700.00	$ 1,350.00	3%
Dock/Boat	unit	$ 3,500.00	1	$ 3,500.00	20	$ 350.00	$ 157.50	$ 78.75	0%
Other 1	$	$ -		$ -	1	$ -	$ -	$ -	0%
Other 2	$	$ -		$ -	1	$ -	$ -	$ -	0%
Total Capital Costs				**$ 36,776.00**			**$ 5,707.47**	**$ 2,853.73**	**7%**

Loan Information		Years	Interest Rate	Loan Balance	Cost / year	Cost / cycle	cost
Capital		7	7.00%	$ 36,776.00	$ 6,823.91	$ 3,411.95	9%
Truck		5	7.00%	$ 12,000.00	$ 2,926.69	$ 97.56	4%
Loan 3		0	0.00%	$ -	$ -	$ -	0%
Loan 4		0	0.00%	$ -	$ -	$ -	0%
Total Loan Costs				**$ 48,776.00**	**$ 9,750.59**	**$ 3,509.51**	**12%**

Summary		Value/cycle	Value/year	Value/cage	% of total cost
Total Receipts	$	$ 49,368.00	$ 98,736.00	$ 4,936.80	
Total Variable Costs	$	$ 21,173.94	$ 56,947.88	$ 2,117.39	81%
Total Overhead Costs	$	$ 1,238.22	$ 6,001.63	$ 123.82	9%
Average Interest Paid	$	$ 973.20	$ 1,946.40	$ 350.95	3%
Depreciation	$	$ 2,853.73	$ 5,707.47	$ 285.37	8%
Total Cost	$	$ 26,239.09	$ 70,603.38	$ 2,877.54	100%
Net Revenue above Variable/Overhead Costs	$	$ 26,955.84	$ 35,786.49	$ 2,695.58	
Net Revenue above Total Costs	$	$ 23,128.91	$ 28,132.62	$ 2,059.26	
Breakeven Price with variable/overhead cost	/lb		$ 1.75		
Breakeven Price with total cost	/lb		$ 1.97		

INCOME STATEMENT

Year Ending

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
REVENUE						
Fish Sales	$ -	$ 98,736.00	$ 98,736.00	$ 98,736.00	$ 98,736.00	$ 98,736.00
Other Income	$ -	$ -	$ -	$ -	$ -	$ -
Gross Revenue	**$ -**	**$ 98,736.00**	**$ 98,736.00**	**$ 98,736.00**	**$ 98,736.00**	**$ 98,736.00**
EXPENSES						
Operating Expenses	$ 47,722.88	$ 62,949.51	$ 62,949.51	$ 62,949.51	$ 62,949.51	$ 62,949.51
Depreciation	$ 5,707.47	$ 5,707.47	$ 5,707.47	$ 5,707.47	$ 5,707.47	$ 5,707.47
Interest	$ 3,414.32	$ 2,970.78	$ 2,496.19	$ 1,988.39	$ 1,445.03	$ 863.64
Total Expenses	**$ 56,844.67**	**$ 71,627.76**	**$ 71,153.17**	**$ 70,645.37**	**$ 70,102.01**	**$ 69,520.62**
Net Farm Income from Operations	**$ (56,844.67)**	**$ 27,108.24**	**$ 27,582.83**	**$ 28,090.63**	**$ 28,633.99**	**$ 29,215.38**
Gain/Loss on Sale of Capital Assets						

POND CULTURE

The budget presented below is a guide to assist you in projecting costs and returns for your aquaculture enterprise. It is to be used for planning your aquaculture operation and developing a budget specific to your situation.

You should change the cells in yellow with blue font to reflect your situation.

Choose the fish species from the drop down menu: **Large Mouth Bass**

Variables	Unit	Value	
Length of production	month	**18**	*time from fingerling to harvest*
Number of cycles/fish stockings in a year	#/yr	**2**	*number of times you wish to harvest/stock in a year for continuous production*
Number of ponds harvested per cycle	ponds/cycle	**2**	*number of ponds you wish to harvest/stock at one time*
Total number of ponds needed	ponds	6	
Pond size	acre	**1**	*pond size of 0.5 to 5 acreas recommended*
Stocking density	/acre	**5,000**	*stocking rate depends on the species*
Fingerling size (6")	lb	**0.04**	*assumes 1,000 6"-fingerlings weigh 35lb*
Harvest size	lb	**1.5**	
Feed Conversion Ratio (FCR)		**2.0**	
Survival	%	**85%**	*% of fish that survives until harvest*

Gross Receipts:		$/unit	quantity / cycle	$/cycle	$/year
Fish sale	$/lb	**$ 4.70**	12,750	$ 59,925.00	$ 119,850.00
Miscellaneous Receipts	$/lb	**$ -**		$ -	
Total Receipts				**$ 59,925.00**	**$ 119,850.00**

Variable Inputs:		$/unit	quantity / cycle	$/cycle	$/year	$/lb/yr	% of total cost	
Fingerlings	$	**$ 1.00**	10,000	$ 10,000.00	$ 20,000.00	$ 0.78	21%	
Feed	$/lb	**$ 0.45**	24,700	$ 11,115.00	$ 22,230.00	$ 0.87	23%	
Chemicals	$/acre	**$ 300.00**	2	$ 600.00	$ 1,200.00	$ 0.05	1%	
Electricity cost for aeration	$/kwh	**$ 0.15**	**3,672**	$ 550.80	$ 1,101.60	$ 0.04	1%	*24 hr aerat'n from May-Sep*
Hired Labor - Hours	$/hr	**$ 10.00**	**1,825**	NA	$ 18,250.00	$ 0.72	19%	*20 hrs / wk / person*
Harvesting	$/lb	**$ 0.05**	12,750	$ 637.50	$ 1,275.00	$ 0.05	1%	
Transportation Cost of Fingerlings	$/fish	**$ 0.05**	10,000	$ 500.00	$ 1,000.00	$ 0.04	1%	
Transportation Cost to Market	$/lb	**$ 0.05**	12,750	$ 637.50	$ 1,275.00	$ 0.05	1%	
Miscellaneous	$/acre	**$ 0.05**	12,750	$ 637.50	$ 1,275.00	$ 0.05	1%	
Other	$	**$ -**		$ -	$ -	$ -	0%	
Total Variable Cost				**$ 24,678.30**	**$ 67,606.60**	**$ 2.65**	**71%**	

Overhead Costs		$/unit	quantity / cycle	$/cycle	$/year	$/lb/yr	% of total cost
Repair & maintenance	$/month	$ 100.00	12	NA	$ 1,200.00	$ 0.05	1%
Insurance	$/yr	$ 1,000.00			$ 1,000.00		1%
Adminstration/Management - legal fees, professional services, etc.	% of TVC	5%	NA	$ 1,233.92	$ 3,380.33	$ 0.13	4%
Other	$	$ -					
Total Overhead Costs				**$ 1,233.92**	**$ 5,580.33**	**$ 0.22**	**102%**

Annual capital costs calculation assumes a straight line depreciation
All capital costs are incurred beginning of year 1

Capital Costs		Cost	Number	Total cost	Yrs of use	Salvage value	Cost/year	Cost/cycle	% of total cost
Feeder blower	unit	$ 5,000.00	1	$ 5,000.00	8	$ -	$ 625.00	$ 312.50	1%
Storage Shed	unit	$ 4,500.00	1	$ 4,500.00	10	$ 450.00	$ 405.00	$ 202.50	0%
Electrical aerators	unit	$ 200.00	6	$ 1,200.00	5	$ 120.00	$ 216.00	$ 108.00	0%
Emergency Generator	unit	$ 1,000.00	1	$ 1,000.00	10	$ 100.00	$ 90.00	$ 45.00	0%
Well & motor	unit	$ 12,000.00	1	$ 12,000.00	20	$ 1,200.00	$ 540.00	$ 270.00	1%
Tractor (50 HP)	unit	$ 17,500.00	1	$ 17,500.00	10	$ 1,750.00	$ 1,575.00	$ 787.50	2%
Misc (waders, scale, test equp)	unit	$ 2,000.00	1	$ 2,000.00	5	$ 200.00	$ 360.00	$ 180.00	0%
Pond construction	unit	$ 5,000.00	6	$ 30,000.00	30	$ 3,000.00	$ 900.00	$ 450.00	1%
Drainage, piping, installations, gravel etc	unit	$ 3,500.00	1	$ 3,500.00	20	$ 350.00	$ 157.50	$ 78.75	0%
Other 1	$	$ -		$ -	1	$ -	$ -	$ -	0%
Other 2	$	$ -		$ -	1	$ -	$ -	$ -	0%
Total Capital Costs				**$ 76,700.00**			**$ 4,868.50**	**$ 2,434.25**	**5%**

Loan Information		Years	Interest Rate	Loan Balance	Cost/year	Cost/cycle	% of total cost
Capital		7	7.00%	$ 76,700.00	$ 14,231.93	$ 7,115.97	15%
Truck		5	7.00%	$ 12,000.00	$ 2,926.69	$ 487.78	3%
Loan 3		0	0.00%	$ -	$ -	$ -	0%
Loan 4		0	0.00%	$ -	$ -	$ -	0%
Total Loan Costs				**$ 88,700.00**	**$ 17,158.62**	**$ 7,603.75**	**18%**

Summary		Value/cycle	Value/year	Value/acre	% of total cost
Total Receipts	$	**$ 59,925.00**	**$ 119,850.00**	**$ 29,962.50**	
Total Variable Costs	$	**$ 24,678.30**	**$ 67,606.60**	**$ 12,339.15**	**83%**
Total Overhead Costs	$	**$ 1,233.92**	**$ 5,580.33**	**$ 616.96**	**7%**
Average Interest Paid	$	**$ 1,825.50**	**$ 3,651.00**	**$ 3,801.87**	**4%**
Depreciation	$	**$ 2,434.25**	**$ 4,868.50**	**$ 1,217.13**	**6%**
Total Cost	$	**$ 30,171.96**	**$ 81,706.43**	**$ 17,975.11**	**100%**
Net Revenue above Variable/Overhead Costs	$	**$ 34,012.79**	**$ 46,663.07**	**$ 17,006.39**	
Net Revenue above Total Costs	$	**$ 29,753.04**	**$ 38,143.57**	**$ 11,987.39**	
Breakeven Price with variable/overhead cost	/lb		**$ 2.87**		
Breakeven Price with total cost	/lb		**$ 3.20**		

INCOME STATEMENT
Year Ending

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
REVENUE						
Fish Sales	$ -	$ 59,925.00	$ 119,850.00	$ 119,850.00	$ 119,850.00	$ 119,850.00
Other Income	$ -	$ -	$ -	$ -	$ -	$ -
Gross Revenue	**$ -**	**$ 59,925.00**	**$ 119,850.00**	**$ 119,850.00**	**$ 119,850.00**	**$ 119,850.00**
EXPENSES						
Operating Expenses	$ 54,166.93	$ 69,853.18	$ 73,186.93	$ 73,186.93	$ 73,186.93	$ 73,186.93
Depreciation	$ 4,868.50	$ 4,868.50	$ 4,868.50	$ 4,868.50	$ 4,868.50	$ 4,868.50
Interest	$ 6,209.00	$ 5,442.53	$ 4,622.40	$ 3,744.86	$ 2,805.90	$ 1,801.21
Total Expenses	**$ 65,244.43**	**$ 80,164.21**	**$ 82,677.83**	**$ 81,800.29**	**$ 80,861.33**	**$ 79,856.64**
Net Farm Income from Operations	**$ (65,244.43)**	**$ (20,239.21)**	**$ 37,172.17**	**$ 38,049.71**	**$ 38,988.67**	**$ 39,993.36**
Gain/Loss on Sale of Capital Assets						
NET FARM INCOME	**$ (65,244.43)**	**$ (20,239.21)**	**$ 37,172.17**	**$ 38,049.71**	**$ 38,988.67**	**$ 39,993.36**

RECIRCULATING AQUACULTURE SYSTEM

The budget presented below is a guide to assist you in projecting costs and returns for your aquaculture enterprise. It is to be used for planning your aquaculture operation and developing a budget specific to your situation.

You should change the cells in yellow with blue font to reflect your situation.

Choose the fish species from the drop down menu: **Yellow Perch**

System Parameters			
Number of production phases	number	**3**	
Phase 1 number of days (nursery)	days	**65**	
Phase 2 number of days (fingerling)	days	**150**	
Phase 3 number of days (growout)	days	**150**	*Leave cell blank if you are not including this phase*
Average # of days/phase	days/phase	122	
Length of Production cycle	days	365	
Number of production cycles per year	number	3	
Expected annual production	lb	37,973	
Overall survival rate	%	77%	
Market size	lb	**0.33**	
Kwh per lb of production	kwh/ lb prod.	**1.50**	
Chemicals	$/cycle	**$ 200.00**	

Capital Investment Costs		**Unit Cost**	**Number**	**Cost**	**Yrs of use**	**Salvage value**	**Yearly cost**
Land	unit		**1**	$ -	**30**	$ -	$ -
Building: Pole barn with concrete floor	unit	**$ -**	**1**	$ -	**30**	$ -	$ -
Complete RAS System	unit	**$ 150,000.00**	**1**	$ 150,000.00	**10**	$ 15,000.00	$ 13,500.00
Construction labor & overhead	unit		**1**	$ -	**5**	$ -	$ -
Settling pond	unit		**1**	$ -	**10**	$ -	$ -
Emergency Generator	unit	**$ 5,000.00**	**1**	$ 5,000.00	**10**	$ 500.00	$ 450.00
Transport tank	unit	**$ 1,000.00**	**1**	$ 1,000.00	**10**	$ 100.00	$ 90.00
Blower	unit	**$ 2,000.00**	**1**	$ 2,000.00	**5**	$ 200.00	$ 360.00
Well & motor	unit	**$ 20,000.00**	**1**	$ 2,500.00	**20**	$ 1.00	$ 124.95
equipment, purge tanks, buckets etc)	unit	**$ 2,500.00**	**1**	$ 2,500.00	**5**	$ 250.00	$ 450.00
Miscellaneous labor (installation of system, utilities, plumbing, etc)	$			$ 5,000.00	**20**	$ -	$ 250.00
Total Capital Investment		**$ 180,500.00**					**$ 15,224.95**

Write down stocking months	April	May	June				

Operating parameters per production phase		Phase 1 (nursery)	Phase 2 (fingerlings)	Phase 3 (growout#1)	Cycle Total	Annual Total	
Water volume	gal	**4,000**	**6,000**	**12,000**			
Size stocked	lb	**0.003**	0.06	0.13			
Size harvested	lb	**0.06**	**0.13**	**0.33**			
Survival rate	%	**85%**	**95%**	**95%**			*Use only female fingerlings to obtain higher survival*
Feed cost	$/lb	**$ 0.50**	**$ 0.45**	**$ 0.45**			
Feed conversion	ratio	**1.40**	**1.30**	**1.30**			
Beginning number of fish	number	**50,000**	42,500	40,375	50,000	150,000	
Ending number of fish	number	42,500	40,375	38,356	38,356	115,069	
Beginning biomass	lb	150	2,550	5,249	150	450	
Ending biomass	lb	2,550	5,249	12,658	12,658	37,973	
Maximum standing biomass	lb/gal	0.64	0.87	1.05			
Feed used	lb	3,360	3,508	9,631	16,500	49,499	
Kwh used	kwh	3,866.35	4,037	11,083	18,986	56,959.03	
Oxygen used	$ / 100 cubic feet	12,146	12,683	34,818	59,647	178,941	

Operating costs Variable Cost	unit	cost/unit	quantity/cycle	$/cycle	$/year	$ per lb of fish	% of total
Fingerlings	$/piece	**$ 0.30**	50,000	$ 15,000	$ 45,000	$ 1.19	30%
Feed (wt avg)	$/lb	$ 0.46	16,500	$ 7,593	$ 22,779	$ 0.60	15%
Electricity	$/kwh	**$ 0.10**	18,986	$ 1,899	$ 5,696	$ 0.15	4%
Oxygen	$ / 100 cu feet	**$ 0.10**	596	$ 60	$ 179	$ 0.00	0%
Chemicals	$ per cycle	$ 800.00	1	$ 800	$ 2,400	$ 0.06	2%
Hired labor	$/hour	**$ 10.00**	200	$ 2,000	$ 6,000	$ 0.16	4%
Tansportation cost of fingerlings	$/lb	**$ -**	50,000	$ -	$ -	$ -	0%
Tansportation cost to Market	$/lb	**$ -**	37,973	$ -	$ -	$ -	0%
Miscellaneous	$	**$ 500.00**	1	$ 500	$ 1,500	$ 0.04	1%
Total variable cost				**$ 27,851**	**$ 83,554**	**$ 2.20**	**55%**

Overhead Cost							
Oxygen tank rental		$ 750.00	1	$ 3,000	$ 9,000	$ 0.08	6%
Electrical demand charge		$ 100.00	1	$ 400	$ 1,200	$ 0.01	1%
Maintenance (3% of cap inv)	3%	$ 1,827	1	$ 1,827	$ 5,481	$ 0.05	4%
Insurance	3% of TCI	10%			$ 1,522		
Adminstration/Management - legal fees, professional services, etc. (% of total overhead)	5% of TVC	5%			$ 4,178	$ 0.04	3%
Other					$ -	$ -	0%
Total overhead cost				**$ 5,227**	**$ 21,381**	**$ 0.17**	**14%**

Loan Information	Years	Interest Rate	Loan Balance	Cost per year	Cost per cycle	
Capital	5	9.00%	$ 180,500.00	$ 46,405.19	$ 15,468.40	31%
Loan 2	0	0.00%	$ -	$ -	$ -	0%
Loan 3	0	0.00%	$ -	$ -	$ -	0%
Loan 4	0	0.00%	$ -	$ -	$ -	0%
Total loan cost			$ 180,500.00	**$ 46,405.19**	**$ 15,468.40**	**31%**

Gross Receipts	unit	cost/unit	quantity/cycle	$/cycle	$/year	$/lb
Fish sale	lb	$ 3.00	12,658	$ 37,973	$ 113,918	$ 1.00
Miscellaneous Receipts	$	$ -		$ -	$ -	$ -
Total receipts				**$ 37,973**	**$ 113,918**	$ 1.00

Summary		Value/cycle	Value/year	$/lb
Total Receipts		**$ 37,972.69**	**$ 113,918.06**	**$ 1.00**
Total Variable Costs		**$ 27,851.21**	**$ 83,553.62**	**$ 2.20**
Total Overhead Costs		**$ 5,226.99**	**$ 21,381.16**	**$ 0.17**
Average Interest Paid		**$ 3,435.06**	**$ 10,305.19**	**$ 0.09**
Depreciation		**$ 5,074.98**	**$ 15,224.95**	**$ 0.13**
Total Cost		**$ 41,588.25**	**$ 130,464.91**	**2.60**
Net Revenue above Variable & Overhead Costs	$	**$ 4,894.49**	**$ 8,983.29**	**$ (1.37)**
Net Revenue above Total Costs	$	**$ (3,615.56)**	**$ (16,546.85)**	**$ (1.60)**
Breakeven Price with variable/overhead cos	/lb	**$ 2.61**		
Breakeven Price with total cost	/lb	**$ 3.29**		

CAGE CULTURE

The budget template presented below is a guide to assist you in projecting costs and returns for your aquaculture enterprise. It is to be used for planning your aquaculture operation and developing a budget specific to your situation.

You should change the cells in yellow with blue font to reflect your situation.

Choose the fish species from the drop down menu: **Hybrid Striped Bass**

Variables	Unit	Value	
Length of production	month		*time from fingerling to harvest*
Number of cycles/fish stockings in a year	#/yr		*number of times you wish to harvest/stock in a year for continuous production*
Number of cages harvested per cycle	cages/cycle		*number of cages you wish to harvest/stock at one time*
Total number of cages needed	cages		
Minimum water surface acreage needed	acres		Based on max fish production of 5K lb/ac/year
Cage Shape		**Rectangular**	*choose the cage size from the drop down menu*
Cage Dimensions			
	Diameter		
	Length		
	Width		
	Height		
Individual Cage Volume	gals		*volume is calculated allowing a foot above water surface*
Stocking density/cage	/cage		*stocking rate is calculated as a lb fish at market per gallon of water*
Fingerling size (5")	lb		*assumes 1,000 5"-fingerlings weigh 30lb*
Harvest size	lb		
Feed Conversion Ratio (FCR)			
Survival	%		*% of fish that survives until harvest*

Gross Receipts:		**$/unit**	**quantity / cycle**	**$/cycle**	**$/year**
Fish sale	$/lb	**$ -**		$ -	$ -
Miscellaneous Receipts	$/lb	**$ -**		$ -	
Total Receipts				**$ -**	**$ -**

Write down stocking months

Variable Inputs:		$/unit	quantity / cycle	$/cycle	$/year	$/lb/yr	% of total cost	
Fingerlings	$	$ -		$ -	$ -			
Feed	$/lb	$ -		$ -	$ -			
Chemicals	$/cage	$ -		$ -	$ -			
Electricity cost for aeration	$/kwh	$ -		$ -	$ -			*assumes 24 hr continuous aeration from May-Sep*
Hired Labor - Hours	$/hr	$ -			$ -			*assumes unpaid owner labor throughout production*
Harvesting	$/lb	$ -		$ -	$ -			
Transportation Costs of Fingerlings	$/fish	$ -		$ -	$ -			
Transportation Costs to Market	$/lb	$ -		$ -	$ -			
Miscellaneous	$/cage	$ -		$ -	$ -			
Other	$	$ -		$ -	$ -			
Total Variable Cost				**$ -**	**$ -**		**0%**	

Overhead Costs		$/unit	quantity / cycle	$/cycle	$/year	$/lb/yr	% of total cost	
Repair and Maintenance	$/lb	$ -		$ -	$ -			
Water acres rental	$/acre	$ -			$ -			*assumes a rental or opportunity cost for use of lake/large pond*
Insurance	$/yr	$ -			$ -			
Adminstration/Management - legal fees, professional services, etc.	% of TVC			$ -	$ -			*assumes a % of Total Variable Cost*
Other 1	$	$ -						
Other 2	$	$ -						
Total Overhead Costs				**$ -**	**$ -**		**0%**	

Annual capital costs calculation assumes a straight line depreciation
All capital costs are incurred beginning of year 1

Capital Costs		Cost	Number	Total cost	Yrs of use	Salvage value	Cost/year	Cost / cycle	% of total cost
Feeders	unit	$ -		$ -		$ -			
Storage Shed	unit	$ -		$ -		$ -			
Electrical aerator (or air lifts)	unit	$ -		$ -		$ -			
Emergency Generator	unit	$ -		$ -		$ -			
Transport tank	unit	$ -		$ -		$ -			
Mower	unit	$ -		$ -		$ -			
Misc (waders, scale, test equp)	unit	$ -		$ -		$ -			
Cages	unit	$ -		$ -		$ -			
Dock/Boat	unit	$ -		$ -		$ -			
Other 1	$	$ -		$ -		$ -			
Other 2	$	$ -		$ -		$ -			
Total Capital Costs				**$ -**				**$ -**	

Loan Information		Years	Interest Rate	Loan Balance	Cost / year	Cost / cycle	cost
Capital		**0**		**$ -**	$ -		
Truck		**0**		**$ -**	$ -		
Loan 3		**0**		**$ -**	$ -		
Loan 4		**0**		**$ -**	$ -		
Total Loan Costs				**$ -**	**$ -**	**$ -**	

Summary		Value/cycle	Value/year	Value/cage	% of total cost
Total Receipts	$	**$ -**	**$ -**		
Total Variable Costs	$	**$ -**	**$ -**		
Total Overhead Costs	$	**$ -**	**$ -**		
Average Interest Paid	$				
Depreciation	$	**$ -**	**$ -**		
Total Cost	$	**$ -**	**$ -**		
Net Revenue above Variable/Overhead Costs	$	**$ -**	**$ -**	**$ -**	
Net Revenue above Total Costs	$	**$ -**	**$ -**	**$ -**	
Breakeven Price with variable/overhead cost	/lb				
Breakeven Price with total cost	/lb				

POND CULTURE

The budget template presented below is a guide to assist you in projecting costs and returns for your aquaculture enterprise. It is to be used for planning your aquaculture operation and developing a budget specific to your situation.

You should change the cells in yellow with blue font to reflect your situation.

Choose the fish species from the drop down menu: **Large Mouth Bass**

Variables	Unit	Value	
Length of production	month		*time from fingerling to harvest*
Number of cycles/fish stockings in a year	#/yr		*number of times you wish to harvest/stock in a year for continuous production*
Number of ponds harvested per cycle	ponds/cycle		*number of ponds you wish to harvest/stock at one time*
Total number of ponds needed	ponds		
Pond size	acre		*pond size of 0.5 to 5 acreas recommended*
Stocking density	/acre		*stocking rate depends on the species*
Fingerling size (6")	lb		*assumes 1,000 6"-fingerlings weigh 35lb*
Harvest size	lb		
Feed Conversion Ratio (FCR)			
Survival	%		*% of fish that survives until harvest*

Gross Receipts:		$/unit	quantity / cycle	$/cycle	$/year
Fish sale	$/lb	$ -		$ -	$ -
Miscellaneous Receipts	$/lb	$ -		$ -	
Total Receipts				**$ -**	**$ -**

Variable Inputs:		$/unit	quantity / cycle	$/cycle	$/year	$/lb/yr	% of total cost	
Fingerlings	$	$ -		$ -	$ -			
Feed	$/lb	$ -		$ -	$ -			
Chemicals	$/acre	$ -		$ -	$ -			
Electricity cost for aeration	$/kwh	$ -		$ -	$ -			*24 hr aerat'n from May-Sep*
Hired Labor - Hours	$/hr	$ -			$ -			*20 hrs / wk / person*
Harvesting	$/lb	$ -		$ -	$ -			
Transportation Cost of Fingerlings	$/fish	$ -		$ -	$ -			
Transportation Cost to Market	$/lb	$ -		$ -	$ -			
Miscellaneous	$/acre	$ -		$ -	$ -			
Other	$	$ -		$ -	$ -			
Total Variable Cost				**$ -**	**$ -**			

Write down stocking months							

Overhead Costs		$/unit	quantity / cycle	$/cycle	$/year	$/lb/yr	% of total cost
Repair & maintenance	$/month				$ -		
Insurance	$/yr				$ -		
Adminstration/Management - legal fees, professional services, etc.	% of TVC			$ -	$ -		
Other	$						
Total Overhead Costs				**$ -**	**$ -**		

Annual capital costs calculation assumes a straight line depreciation
All capital costs are incurred beginning of year 1

Capital Costs		Cost	Number	Total cost	Yrs of use	Salvage value	Cost/year	Cost/cycle	% of total cost
Feeder blower	unit	$ -		$ -		$ -			
Storage Shed	unit	$ -		$ -		$ -			
Electrical aerators	unit	$ -		$ -		$ -			
Emergency Generator	unit	$ -		$ -		$ -			
Well & motor	unit	$ -		$ -		$ -			
Tractor (50 HP)	unit	$ -		$ -		$ -			
Misc (waders, scale, test equp)	unit	$ -		$ -		$ -			
Pond construction	unit	$ -		$ -		$ -			
Drainage, piping, installations, gravel etc	unit	$ -		$ -		$ -			
Other 1	$	$ -		$ -		$ -			
Other 2	$	$ -		$ -		$ -			
Total Capital Costs				**$ -**			**$ -**	**$ -**	**0%**

Loan Information		Years	Interest Rate	Loan Balance	Cost/year	Cost/cycle	% of total cost
Capital		**0**		**$ -**	$ -		
Truck		**0**		**$ -**	$ -		
Loan 3		**0**		**$ -**	$ -		
Loan 4		**0**		**$ -**	$ -		
Total Loan Costs				**$ -**	**$ -**		

Summary		Value/cycle	Value/year	Value/acre	% of total cost
Total Receipts	$	**$ -**	**$ -**		
Total Variable Costs	$	**$ -**	**$ -**		
Total Overhead Costs	$	**$ -**	**$ -**		
Average Interest Paid	$				
Depreciation	$	**$ -**	**$ -**		
Total Cost	$	**$ -**	**$ -**		
Net Revenue above Variable/Overhead Costs	$	**$ -**	**$ -**		
Net Revenue above Total Costs	$	**$ -**	**$ -**	**$ -**	
Breakeven Price with variable/overhead cost	/lb				
Breakeven Price with total cost	/lb				

RECIRCULATING AQUACULTURE SYSTEM

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Choose the fish species from the drop down menu: **Yellow Perch**

System Parameters			
Number of production phases	number		
Phase 1 number of days (nursery)	days		
Phase 2 number of days (fingerling)	days		
Phase 3 number of days (growout)	days		*Leave cell blank if you are not including this phase*
Average # of days/phase	days/phase		
Length of Production cycle	days		
Number of production cycles per year	number		
Expected annual production	lb		
Overall survival rate	%		
Market size	lb		
Kwh per lb of production	kwh/ lb prod.		
Chemicals	$/cycle		

Capital Investment Costs		**Unit Cost**	**Number**	**Cost**	**Yrs of use**	**Salvage value**	**Yearly cost**
Land	unit	$ -		$ -		$ -	
Building: Pole barn with concrete floor	unit	$ -		$ -		$ -	
Complete RAS System	unit	$ -		$ -		$ -	
Construction labor & overhead	unit	$ -		$ -		$ -	
Settling pond	unit	$ -		$ -		$ -	
Emergency Generator	unit	$ -		$ -		$ -	
Transport tank	unit	$ -		$ -		$ -	
Blower	unit	$ -		$ -		$ -	
Well & motor	unit	$ -		$ -		$ -	
equipment, purge tanks, buckets etc)	unit	$ -		$ -		$ -	
Miscellaneous labor (installation of system, utilities, plumbing, etc)	$	-		$ -		$ -	
Total Capital Investment		$ -					

Write down stocking months							

Operating parameters per production phase		Phase 1 (nursery)	Phase 2 (fingerlings)	Phase 3 (growout#1)	Cycle Total	Annual Total	
Water volume	gal	-	-	-			
Size stocked	lb						
Size harvested	lb						
Survival rate	%						*Use only female fingerlings to obtain higher survival*
Feed cost	$/lb	$ -	$ -	$ -			
Feed conversion	ratio						
Beginning number of fish	number	-	-	-	-	-	
Ending number of fish	number	-	-	-	-	-	
Beginning biomass	lb	-	-	-	-	-	
Ending biomass	lb	-	-	-	-	-	
Maximum standing biomass	lb/gal						
Feed used	lb						
Kwh used	kwh						
Oxygen used	$ / 100 cubic feet	0	0	0	-	-	

Operating costs Variable Cost	unit	cost/unit	quantity/cycle	$/cycle	$/year	$ per lb of fish	% of total
Fingerlings	$/piece	$ -	-	$ -	$ -		
Feed (wt avg)	$/lb		-	$ -	$ -		
Electricity	$/kwh	$ -	-	$ -	$ -		
Oxygen	$ / 100 cu feet	$ -	-	$ -	$ -		
Chemicals	$ per cycle			$ -	$ -		
Hired labor	$/hour	$ -		$ -	$ -		
Tansportation cost of fingerlings	$/lb	$ -	-	$ -	$ -		
Tansportation cost to Market	$/lb	$ -	-	$ -	$ -		
Miscellaneous	$	$ -		$ -	$ -		
Total variable cost				$ -	$ -		

Overhead Cost							
Oxygen tank rental		$ -			$ -		
Electrical demand charge		$ -			$ -		
Maintenance (3% of cap inv)	0%			$ -	$ -		
Insurance	3% of TCI				$ -		
Adminstration/Management - legal fees, professional services, etc. (% of total overhead)	5% of TVC				$ -		
Other					$ -		
Total overhead cost				$ -	$ -	$ -	

Loan Information		Years	Interest Rate	Loan Balance	Cost per year	Cost per cycle	
Capital		0		$ -	$ -		
Loan 2		0		$ -	$ -		
Loan 3		0		$ -	$ -		
Loan 4		0		$ -	$ -		
Total loan cost				$ -	$ -	$ -	

Gross Receipts	unit	cost/unit	quantity/cycle	$/cycle	$/year	$/lb
Fish sale	lb	$ -	-	$ -	$ -	
Miscellaneous Receipts	$	$ -		$ -	$ -	
Total receipts				$ -	$ -	$ -

Summary		Value/cycle	Value/year	$/lb
Total Receipts		$ -	$ -	$ -
Total Variable Costs		$ -	$ -	$ -
Total Overhead Costs		$ -	$ -	$ -
Average Interest Paid				
Depreciation			$ -	
Total Cost		$ -	$ -	-
Net Revenue above Variable & Overhead Costs	$	$ -	$ -	$ -
Net Revenue above Total Costs	$	$ -	$ -	$ -
Breakeven Price with variable/overhead cos	/lb			
Breakeven Price with total cost	/lb			