

**Agency: Commerce, Community and Economic Development****Grants to Municipalities (AS 37.05.315)****Grant Recipient: Yakutat****Federal Tax ID: 92-6001319****Project Title:****Project Type: Planning and Research**

# Yakutat - Economic Development Federal Matching Program

**State Funding Requested: \$646,000****House District: 5 / C**

Future Funding May Be Requested

**Brief Project Description:**

Borough-wide program initiating economic development projects with matching U.S. Army Corps of Engineers major contribution

**Funding Plan:**

Total Project Cost:	\$1,907,000
Funding Already Secured:	(\$1,093,000)
FY2012 State Funding Request:	<u>(\$646,000)</u>
Project Deficit:	\$168,000

*Funding Details:*

*This is a new project with unique one-time opportunity to secure federal funds not previously available for economic development projects in the City and Borough of Yakutat*

**Detailed Project Description and Justification:**

This project is a package of related coastal development projects such as:

- preliminary work on remote release site for enhanced chum salmon to diversify and expand local fishing economy.
- genetic study of local salmon stocks to improve management of all local salmon fisheries; this will enable local fisheries to stay open longer by differentiating local stocks in mixed stock offshore fisheries.
- initial funding of Yakutat Holding Company, a non-profit Community Quota Entity program, to bring ownership of fishing rights to local fishing fleet and secure product for local seafood processing plant (largest private employer)
- planning and design of coastal education and development center to include research housing, facilities to assist with hatchery and future mariculture expansion, eventually including a community library and tourism-oriented interpretive center.
- mariculture development program (this element does not require state match; private funds committed)
- power self-sufficiency project developing biomass energy system.

**Project Timeline:**

Receipt of state match in FY 12 will garner federal funds already identified and available (see attached letter from Corps of Engineers). Work on some elements will commence July 2011, some elements will involve design work bids to be issued in fall 2011. Overall eventual timeline spans into 2013 and beyond.

**Entity Responsible for the Ongoing Operation and Maintenance of this Project:**

City and Borough of Yakutat

**Grant Recipient Contact Information:**

Name: Skip Ryman  
Title: Borough manager  
Address: Box 160  
Yakutat, Alaska 99629  
Phone Number: (907)784-3323  
Email: sryman@yakutatak.us

Has this project been through a public review process at the local level and is it a community priority?  Yes  No

**CITY AND BOROUGH OF YAKUTAT  
SUMMARY OF U.S. ARMY CORPS OF ENGINEERS ECONOMIC  
MITIGATION PROGRAM**

For the last twenty-five years the United States Corp of Engineers, the State of Alaska Emergency Planning and the City and Borough of Yakutat have been monitoring the advancing Hubbard Glacier. The studies have focused on the inevitable, permanent damming of the entrance to Russell Fjord, creating a fresh water lake that will rise in depth until it eventually overtops an ancient moraine flooding the Situk and Lost Rivers. To date the studies have focused on the geologic anomalies of the event, the potential negative impact on federal lands, federal infrastructure and immediate danger to human safety.

The Situk River and its tributaries represent the base for approximately 70% of the Yakutat Borough's economy. Working closely with the Army Corp and the USDA over the years, Yakutat has developed a list of economic mitigators that would counter loss of the Situk River's contributions to commercial fishing, visitor industry and subsistence use. In a significant break with the Corp's traditional approach to disaster response, they have been awarded **\$930,000** to further investigate these mitigators and assist Yakutat and the State in the rebuilding of Yakutat's economy. The federal money has a fifty percent match criteria which Yakutat, a community of less than 700, cannot match.

CBY, in conjunction with the Corps of Engineers, has identified a number of projects that are both important to the Yakutat economy generally, and also fit the criteria of providing economic disaster mitigation. They all involve diversifying the economy away from its current dependence on the Situk River. All of the attached project are now on our CIP list and have the approval of the Assembly. While "Capital Improvement" involves "infrastructure" and the federal money is for "study" we have confirmed with the Corp that the attached list of projects can be incorporated as pilot project study components. We are requesting State support in the amount of **\$646,000** to help Yakutat meet the matching fund requirement and begin work on the economic growth opportunity presented by these federal funds. Just as important, this represents a very unique opportunity for the State of Alaska to participate directly in a new and exciting expansion of Corps participation in their many Alaska activities. This facet of economic mitigation within disaster relief projects is a new threshold for the Corps.

This funding, and its requirements have only been known to Yakutat for a few short weeks which include the holiday season and associated personnel absences. Exact details of individual projects will take time to develop and the Corp funding could be lost in the process. We propose to work closely with DCCED and we will seek support and approval from the State agencies associated with the various projects. We will work directly with DNR regarding agri-forest biomass energy development, waterfront development and land surveys. We will work closely with ADFG and DCCED on the community quota and aquaculture projects. The City and Borough of Yakutat looks forward to capitalizing on this unique opportunity in partnership with all parties involved.



REPLY TO  
ATTENTION OF:

**DEPARTMENT OF THE ARMY**  
U.S. ARMY ENGINEER DISTRICT, ALASKA  
P.O. BOX 6898  
JBER, ALASKA 99506-0898

Civil Project Management Branch

City and Borough of Yakutat  
ATTN: Skip Ryman  
P. O. BOX 160  
Yakutat, Alaska 99689

Dear Mr. Ryman,

This letter is in response to your call on February 2, 2011 which requested a status letter on the Yakutat General Investigations project which we are presently scoping. Please feel free to share this letter with any other parties that need the contained information for funding issues, or scoping of collateral efforts. We are always willing to respond directly to questions and concerns about projects and programs we are performing.

You asked about funding, match requirements, mechanism of performance, and potential expansion of this mechanism. This study is following a watershed methodology to look at concerns within the Situk River watershed and environs. Here in the District we call it the Yakutat Watershed Study. The Civil Works Identification Number (CWIN) for this project is 013855, and the amount of Federal funds presently available for expenditure on this project is \$930,000. This study was authorized as a feasibility study and requires a cost-share match of 50%. This cost-share can be provided as either cash (given to the Corps of Engineers) or in-kind services performed and paid for by the cost-share sponsor. All of the required cost-share can be provided with in-kind services. All of the in-kind services must be included in the description of the work in the Feasibility Cost - Share Agreement (FCSA) or the attached scoping document, for the in-kind services to be a valid part of the cost-share. We need to complete the scoping and sign a FCSA before September 30, 2011 to make sure that the present funds available (and future Federal funds) stay available for this project. Our present progress to this end indicates this should not be a problem.

A watershed methodology uses a comprehensive collaborative approach to the identification of concerns and potential solutions within a defined area or watershed. The idea is to avoid picking out one issue, and defining a solution for it without looking at other issues that compound it or make it resistant to change. In this instance we have prior studies that indicate a structural solution to the potential Russell Lake overflow into the Situk River is not cost effective. While the damages to the ecosystem will be very high and the damage to Yakutat's economy very substantial, the possible structural

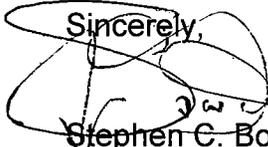
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SUBJECT: Yakutat Watershed Study

solutions are extremely expensive. This study is primarily aimed at globally defining methods of reducing the economic damage to Yakutat in collaboration with other agencies, public and private entities and stakeholders. To assure that each mitigation method is valid, an analysis of each solution, for cost effectiveness and robustness, will be required. This may require testing of the proposed solution to obtain quantitative parameters, when the method has insufficient applicable data from other usages. The watershed methodology is quite flexible and is presently being used by the Corps to look at many differing water resource concerns. The Alaska District presently has two other studies using the watershed methodology.

We look forward to completion of the scoping effort and the signing of the study agreement. If you have any questions or concerns about this letter, please contact David Williams, Project Manager at (907)753-5621, or me at (907)753-5799.

Sincerely,

  
Stephen C. Boardman, P.E.  
Chief, Civil Project Management Branch

### Hubbard Glacier Closure and Situk Flooding Mitigation Feasibility Studies

Title	ACOE Funds (committed)	State Request	Other Matching	Total funding	Mitigation Concept
Biomass Combined Heat and Power Plant Feasibility Study	150,000	NA	150,000 CBY	300,000	Lower power costs, lower fish processing cost, diversification of job market to give opportunities to displaced Situk Fishermen
Community Entity Quota Pilot Project	300,000	300,000	NA	600,000	Increase participation in offshore fisheries to replace lost salmon fishery. Provide charter licenses to Situk guides
Chum Salmon remote release permitting, planning, & feasibility	196,000	196,000	Potentially NSRAA, DIPAC, or PWSAC	392,000	Create new fishery unaffected by flooding event for Situk fishermen
Yakutat Bay Salmon Genetics Investigation	50,000	50,000	15,000 CBY (\$5000 Local Salmon Tax for three years)	115,000	ADF&G indicated a need to close the Yakutat Bay gillnet and troll fisheries in the case of a Situk overflow event. In order to minimize closure time, accurate genetics information can estimate the percentage of Situk-bound fish.
Planning for a remote learning center for distance education in conjunction with ongoing planning for a community science center.	100,000	100,000		400,000	Providing remote degree classes increases the ability for fishermen and other residents to retrain and earn degrees in a variety of disciplines during fishery closures. Provides research center to open new fisheries and creates research jobs for Situk fishermen. Tourism
Shellfish aquaculture: research and expansion	150,000	NA	75K Yak-tat Kwaan 75K Sealaska Corp	300,000	Increasing oyster rearing and other shellfish aquaculture provides alternative seafood revenue
<b>Total</b>	<b>946,000</b>	<b>646,000</b>	<b>315,000</b>	<b>1,907,000</b>	<b>Total</b>

## 1.) Biomass Feasibility Study

**US Army Corps request \$150,000**

**State request – Alaska Energy Authority \$150,000**

### **Background**

The high cost of energy in rural Alaska is a well-known problem. In an effort to decrease these costs, the borough has created a power alliance with the Yak-Tat Kwaan Inc, USFS and interested businesses.

The City is currently managing a \$250,000 grant through the Alaska Energy Authority. At present \$150,000, remain in this fund, which would constitute match towards the ACOE mitigation fund.

There are two components to the program; engineering and fuel sourcing.

The proposal would request \$75,000 for each component to expand the value of the existing grant.

### ***Overview of Engineering***

The objectives outlined in the request for proposal are 1) to define a biomass CHP concept design to meet Yakutat's base load requirements, and 2) to develop a comprehensive business plan, essential to proceeding with further full-scale development of the biomass CHP facilities.

### ***Issues***

Yakutat has an existing power plant, which results in ratepayer costs of approximately \$0.56/kWh depending upon the price of diesel fuel. The cost has historically been much higher in recent years, and the volatility of market pricing will continue.

Another important and detrimental factor to diesel power production is that the cost of fuel continues to leave the local community because the fuel is not sourced locally but is brought in by barge.

A local source of fuel for the production of electricity is of prime interest to the Yakutat community. One identifiable source is evident in the available land for crop production, and the favorable growing environment. These factors contribute to the viability of biomass production from one or more of many fast-growing woody crops, one form of biomass.

Other tangible benefits to locally sourced biomass fuel are the reduction in carbon footprint versus diesel power production and both retention and control of fuel costs.

## **Deliverables**

### **Concept Design**

The concept design shall include the design specification and selection of all components for the complete assembly of the CHP system and facilities.

### **Business Plan**

The most important deliverable is a comprehensive business plan, which will:

- CHP system concept design (above)
- Draft agreements or MOU's for biomass fuel procurement, site control and ROW
- Economic analysis of various biomass fuels / sources
- Business operational model of the biomass CHP plant
- Detailed project proposal for full-scaled development of the power plant

## **Part 3 - Proposed Work Plan & Schedule**

### ***Heat Technology & Engineering***

The biomass CHP power plant design must examine the community's electrical power and thermal energy needs. Today, the thermal energy used in the fish processing facilities to drive absorption chillers provided by fossil fuels.

We will examine the community's existing needs for both heat and power, and develop a CHP system that can meet the existing and potentially expand the thermal energy utilization in a concept CHP power plant design.

The results of the community evaluation noted above, the heat exchangers that will be required would include:

- Direct thermal (for absorbers, district heating, etc.)
- Economizers
- Heat recover/rejection
- Condensers
- Flue Gas Economizer/Scrubber
- Evaporators

The heat exchangers with the exception of the primary biomass heater designed to ASTM Section VIII DIV II standards for unfired pressure vessels. The primary biomass heater will also be designed, specified to ASTM Section VIII for fired pressure vessels, or as required by code.

Each heat exchanger will be designed to the final requirements defined by the balance of plant, and will be designed for optimization of both the thermal loads of the community and applicable local businesses, as well as the thermal energy required for optimum conversion to electrical power production.

### ***Burner Engineering***

Maximizing the energy potential of a biomass feedstock is paramount to the cost effectiveness of a biomass CHP plant. To do so must start with the conversion of the biomass to thermal energy and the management of that thermal energy.

In this proposal, we will use our experience with industrial boilers, heat exchangers and thermal energy management, as well as our experience working with biomass heater designers and manufacturers to select or design the most effective burner and thermal management system for the exacting requirements unique to Yakutat.

## ***Turbine Engineering***

The contractor will design the CHP system for the optimum combination of base load capacity, redundancy, system design, and integration. At the heart of the electrical capacity is the vapor turbine.

The exacting CHP requirements will first be used to define the overall combined cycle system design. Each of the system components will be selected or designed to meet its respective duty. The performance of each component will affect the balance of plant operations and therefore require an iterative design approach. The resulting component selections will provide definitive operating conditions for the most critical of the system assemblies; the vapor turbine & generator. Such conditions include the pressure and temperature of the working fluid at the inlet and exit of the turbine, thus defining the expansion ratio and specific work. Further, the specified turbine power and specific work will be used to define the required working fluid massflow and therefore the turbine geometry.

We will first examine existing vapor turbines commercially available today, and evaluate their applicability to the Yakutat specific CHP system design. If a production turbine does meet the specific duty and operating conditions for the system, that turbine will be specified in the design subject to a commercial agreement with the manufacturer.

The contractor has more than 20 years in turbomachinery design, and nearly 10 years in vapor turbine design and manufacturing. If a commercial turbine does not exist that matches the Yakutat requirements, we have the experience to make the necessary modifications to convert a best candidate to our exacting requirements. Such modifications may include aerodynamics, bearings, seals, generators, gear sets, balance pistons, cooling, etc.

Note that the existing diesel power plant generates at approximately 7.2KV. The vapor turbine will therefore drive a synchronous or permanent magnet generator at 7.2KV. There will be no need for a signal generator to excite the vapor turbine generator, so the biomass power plant will be fully capable of operating without any additional power equipment.

## ***Integration Design***

The biomass CHP power plant will be designed to provide 100% of the heat and power (CHP) base load. However, an existing infrastructure and local grid is in place to provide the electrical power to the community. The current power is provided by one power plant consisting of multiple diesel generators. Current and future plans include upgrades to the existing plant and/or an addition of a newer diesel plant.

Our design approach is to integrate the biomass electrical production into the existing power management system with grid and equipment protection. Therefore, power management will have the safeguards in place, consistent with CA Rule 21 adopted by the California Energy Commission on 21 December 2000 for distributed power production. Grid protection equipment will include a Beckwith controller or similar. Further, the system will be designed to be compliant with IEEE 519 and UL 1741.

A partial list of applicable standards is as follows:

- CA Rule 21
- IEEE 519
- UL 1741
- IEEE 1547

Controls of the power production will be fully integrated into the power management system to ensure safe operation of either or both power plants concurrently. We will provide the design of the power production management and centrally locate it at the discretion of Yakutat Power.

### ***Footprint***

Optimization of the CHP system design to meet the community's current and future needs will require careful consideration of the location(s) of the biomass plant(s). Further, the power plant design will include the infrastructure required to support all the operational requirements.

Nonetheless, we will design the system with the highest possible power density possible, without compromising the operational logistics to support the plant.

Some of the considerations (not all) that will be given to the plant layout and design are:

- Biomass fuel delivery, processing, drying, storage
- District heating infrastructure & management
- Safety systems
- Control room and employee related work spaces
- Operation & maintenance
- Switchgear and power electronics
- Flue gas economizing/scrubbing
- CO<sub>2</sub> sequestration (greenhouses)

### ***Final Design***

The final system design will include full details of the entire biomass CHP plant, including component specifications, vendor selections, pricing (quoted where applicable), and field drawings (mechanical, electrical, elevation, plan). The components will include but not limited to the biomass heater, district heating and electrical power production equipment.

### ***Program Management***

The group employs engineers and designers who have decades of technical experience in Alaska and the lower 48 in program management of power production equipment design and field installation. Much of that experience relates to pre-production equipment, primary installation, and communicating the activities of contractors unfamiliar with the equipment as well as maintaining fully engaged with OEM's as applicable.

**Part 4 – Estimated Cost to Yakutat**

The total program cost contained in this proposal is \$192,000 as follows:

Heat Technology & Engineering	\$29K
Burner Engineering	\$19K
Turbine Engineering	\$31K
Integration Design	\$34K
Project Management	\$21K
Biomass CHP System Design Report	\$22K
Business Plan	\$36K

**The \$75,000 request from the army corps will cover integration with the existing power plant, business plan and greenhouse design, which were outside the scope of the original AEA funding.**

## **Part 5 – Proposed Project Team**

The prime contractor for this proposal is the Yak-Tat Kwaan, with substantial support from the following sub-contractors

Chena Power LLC  
2040 Richardson Highway  
Fairbanks, AK

RBA Engineers, Inc.  
301 East Fireweed Lane, Suite 100  
Anchorage, AK 99503

WMB Enterprises  
8226 Royal Scarlet Dr.  
Baldwinsville, NY 13027-8939

### ***Overview of Fuel Sourcing***

#### **Background**

The City and Borough of Yakutat (Yakutat) and Yak-tat Kwaan Inc. (Kwaan) require 20,000 tons of biomass per year as combustion feedstock to generate energy as hot water to feed a proposed combined heat and power plant. Bionera Resources Inc. (Bionera) was contacted by the Kwaan to conduct a three-day site visit in July 2010 and consider options for biomass supply. This included a cursory review of the land base with respect to overall size, climate, topography, soils, vegetation (with most attention to woody species), history and community culture, and ecological values. The Yakutat Salmon Board provided an overview of the fisheries resource, which is a fundamental aspect of Yakutat, Alaska and is its primary economic driver.

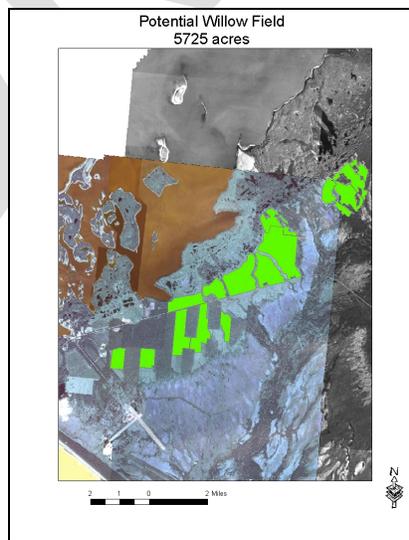
Bionera and CBY staff assessed the viability of establishing an energy crop to provide 20,000 tons of biomass annually as feedstock for a combined heat and power plant. Bionera recommends consideration of a diverse approach, including assessment of these five options for biomass supply:

1. Forestry thinning
2. Log yard debris
3. Roadside Sitka Alder, Willow spp. and Cottonwood
4. Purpose grown energy crop using native Sitka Alder, Willow spp. and Cottonwood
5. Purpose grown energy crop using Red Alder, hybrid Willow and/or hybrid Poplar

Delivered biomass cost ranges for these options are wide at this point (\$25 to \$100 per ton). Option 3 occupies the lower end of the range and option 4 occupies the higher end of the range. Further work will narrow these ranges.

The proposed assessment of biomass feedstock options are separated into phases with milestones at key decision points. For example, phase one would include cost estimates within a range of plus/minus 25% and include assessment of any fundamental impediments, along with resource requirements for continuation of the energy crop trial already in place at Yakutat. Phase two would include detailed consideration of required elements and a more refined cost estimate.

Current partners' in biomass harvest and renewable woody crops include University of Alaska Fairbanks with Professor Steve Sparrow, Bioneera consulting with John Kitchen, Alaska Conservation Foundation Biomass Intern funded through USFWS, Sealaska Corporation (match to be determined), Yakutat Power, Yak-tat Kwaan (match to be determined) and CBY



## Yakutat Biomass Funding Sources

Agency and Program	Amount	Status	Purpose
Alaska Energy Authority (AEA) Alternative Energy	\$81,700	confirmed and in place	to explore alternative energy options to reduce reliance on diesel-fired power
USDA, Natural Resource Conservation Service (NRCS)	\$33,660	applied and likely	to enhance ungulate habitat and general forest health, and to test biomass yield
Conservation Intern, US Fish and Wildlife Service	\$4,000	confirmed and in place	to determine appropriate buffer width between streams and biomass activities
US Forest Service, Summer Forester	\$7,000	requested	to focus on forestry / agroforestry / energy crop crossover issues
<b>Subtotal</b>	<b>\$126,360</b>		
US Army Corp of Engineers (USACE) Hubbard Mitigation	\$75,000	applied	to mitigate potential business loss that will arise from glacial damming of Russell Fjord
<b>Subtotal</b>	<b>\$201,360</b>		
US Forest Service, Resource Advisory Committee (RAC) Tier 2 Grant	\$30,000	proposed, not yet applied	to open Humpy Creek Road for stream rehabilitation access, thinning and potentially for access to lands highly suited to alder biomass production
<b>Total</b>	<b>\$231,360</b>		

**The additional \$75K in USACE funding will an \$81K AEA funded crop investigation. Total funding for USACE mitigation and nonfederal match = 156K**

## Specific Tasks

<b>Tasks planned for 2011</b>	<b>Cost</b>
Basal area determination for existing second growth to assess number of years of biomass available before plantation sections are in production. Test harvesting of suitable areas.	\$8,000
Complete biomass feedstock cost and volume estimates to +/- 15%	\$8,000
Complete evaluation of biomass feedstock production potential from other, non-organized regeneration areas	\$7,000
Estimate Yakutat woody biomass growth rate from available information. Obtain past timber harvest (USFS, Mental Health Trust, and YTK) and stand density studies from the area.	\$6,000
Continue energy crop testing - maintenance	\$32,000
Continue energy crop testing - 2nd set of plots	
Assess disease potential and predation rates	
Overwinter survival rates and growth rates for initial plantings	
Test splitting of logging debris and grinder feed rate	\$35,000
Collect data from 2011 thinning and yarding operations	\$6,000
Evaluate compliance of options with Coastal Management Plan	\$1,500
Obtain list of areas that may require preservation for Alaska Native heritage and other cultural or archeological values	\$800
Provide a description of integrated weed management required to establish as energy crop	\$700
Consider permit requirements for the introduction of non-native species/varieties and investigate hybridization potential with native species	\$2,000
In-depth estimation of establishment and operating costs for each remaining option, including land clearing, drainage, planting stock and method, production equipment needs, suitability of available Sealaska heavy equipment, personnel needs, and fertilizer requirements for optimum production	\$10,000
YSB will contract groundwater /flow analysis to US Geological Survey for existing stream systems in FY 2011	
Review of Yak-Tat Kwaan Forest Stewardship Plan and submission of amendments for inclusion of agroforestry component to the state forester.	\$2,500
Estimate acreage of spruce forests left on the landscape necessary to maintain watershed functions	\$7,500
<b>Deferred tasks</b>	
Consider options for local production of planting stock sources, use of greenhouses, seed crops, etc.	\$10,000
Evaluate roadside strip plantations in regards to sunlight and production	\$25,000

potential, including design to accommodate potential commercial berry production component	
Author National Environmental Policy Act documents if federal funding subsidizes the project	\$5,000
<b>Total</b>	<b>\$167,000</b>

## 2.) Community Quota Entity

### **US Army Corps Request \$300,000**

### **State request \$300,000**

#### **Background**

Yakutat's two dominant private industries are commercial and sport fishing. In an effort to diversify the fishing economy away from the Situk River there are four options for commercial fisheries; the first is to create new salmon fisheries through aquaculture. The second is to grow the offshore ground fish fleet. The third is to expand and diversify shellfish production. The fourth is to open or reopen new non-salmon wild-stock fisheries such as crab and dogfish.

The only option for mitigating loss to the sport fishing industry is to switch from freshwater river guiding to marine based charter boats. The reason for this is that the US Forest Service holds control over the amount of user days on the other rivers and these areas are at full capacity. Therefore Situk River guides cannot move. There are currently twelve licensed charter boats operating in Yakutat. In addition, there are Twenty-one registered freshwater fishing guides operating within the borough.

The community of Yakutat's population was 552 during the last census. Current IFQ holders number 31 with an average of 5,178 pounds per shareholder. In addition, there are approximately 156 commercial salmon permit holders and 52 licensed crewmembers (From CFEC). All told, there are around 200 fishermen and crew in Yakutat, taking into account multiple permits per fishermen. Given the population, around 36% of the population is actively involved in harvesting seafood.

#### **CQE Formation**

In an effort to initiate the expansion of the ground fish fleet in Yakutat, the City of Yakutat formed a non-profit entitled the "***Yakutat Holding Corporation***" (YHC). This entity formed as a Community Quota Entity under NOAA regulations. The YHC is eligible for up to ten blocks of quota in area 3A for halibut and ten blocks for black cod in the management area known as West Yakutat. Depending on current Total Allowable Catch (TAC) estimates, around 2-300,000 pounds are available to the

YHC for purchase. In addition, the entity may apply for seven charter permits for use within the Yakutat Borough.

**Financial Impact**

This project proposes to use a combination of Federal, State and Local funding to purchase \$600,000 worth of community quota. Though less than 10% of the amount needed to purchase the entire allotment of catch shares legally afforded to YHC, the funding would initiate around a 20,000-pound “pilot project”. Beginning the program will accomplish several steps toward diversifying the local commercial fishery including:

- a) creating a familiarity with managing the program (e.g. finances, annual NOAA reporting, non-profit management, etc.)
- b) increased exposure for Yakutat fishermen to the offshore ground fishery. This creates familiarity with a fishery unlike set netting on the Situk River. In turn, crewing on offshore boats may increase the amount of gill net fishermen buying quota independently, helping the overall local economy and providing a buffer against lost revenue in the event of Hubbard related salmon closures.
- c) Initiation of a revenue stream that will expand the program to its full potential

**Budget**

Quota	Price per pound Jan (2011)	Poundage value for \$600,000	2010 average exvessel value	Projected 2011 exvessel value
Halibut Quota	\$28.00 C-Class	21,429	\$4.86	104,144.94
Black Cod Quota	\$21.00 West Yakutat	28,571	\$3.76	107,426.96

**Budget Narrative**

Fishermen would lease quota for 50% yielding roughly \$50,000 annually to the CQE. The CQE board would maintain a savings account to be using funds as a loan down payment or allowed funds to accrue until enough exists to purchase additional blocks of quota. Legislation scheduled for the 2011 legislative si

Replacement of the initial \$600,000 investment occurs in twelve years.

3.) Chum Salmon Remote Release Site – planning, feasibility and initial rearing

**US Army Corps Request \$196,000**

**State request \$196,000**

The clearest mitigation to lost fishing opportunity on the Situk River is to create a terminal salmon fishery that can utilize existing skills and equipment of Yakutat Fishermen. The permitting and planning needed to initiate a project of this magnitude is substantial. The proposed project will fund permitting, create a business plan for sustainability, customize the operation plan to Yakutat Bay and initiate small scale pen rearing. The first phase of the project is experimental. The unknowns include sourcing local chum for egg takes, management structure and success of returns. As staff experience grows, the board can evaluate operational expansion on a yearly basis.

The Yakutat Fishermen's Alliance is a newly formed non-profit (see attached certificate). This group could be the legal recipient of aquaculture funding and act as the liaison between ADF&G and a southeast aquaculture association. The group has a diverse membership and includes shellfish growers and commercial fishermen of various gear groups.

**Experimental start-up**

Establishing brood stock is the first step towards a successful remote release site. In 2010, 871 chum were harvested from the Tsiu river to the East Alsek River. Numbers indicate need to build brood stock over time.

<b>Area</b>	<b>Harvest</b>	<b>Escapement</b>
East Alsek River	275	Possibly 3-6K some years
Alsek River	20	?
Akwe River	15	Maybe some in Italio
Dangerous River	26	?
Situk River	147	50-75
Yakutat Bay	353	NA
Manby Shore	33	?
Tsiu River	2	?

## Calculations

- One net pen will hold 3,000,000 chum until they reach 2 grams
- Fecundity Rule of thumb is 1000 fish for 1,000,000 eggs
- 3000 male and female chum are necessary for 3,000,000 eggs
- 90% survival produces 2,700,000 alevin
- Survival rate for 2,700,000 alevin averages 2% producing 54,000 chum
- Using an average of 8 pounds for adult chum average return is 432,000 pounds
- Average exvessel price for chum salmon in 2010 was 66 cents/pound
- Possible contribution of one net pen to salmon fishery = \$285,120/year before costs
- Average value of Situk salmon fishery is \$780,000/year for all species (from ADF&G)

These average calculations make several assumptions, as the project is experimental; however, it is possible to see full mitigation of lost salmon revenue to Situk Gill net fishermen in the case of a Hubbard related closure

## **Budget**

<b>Action Item</b>	<b>Army Corps Request</b>	<b>State Request</b>
ADF&G Permitting	5,000	5,000
Operating Plan	25,000	25,000
Business Plan	7,500	7,500
Net Pen Manufacturing	33,170	33,170
Egg take	25,000	25,000
Remote Incubation Costs	5,000	5,000
Alevin Transport	10,000	10,000
NOPAL Incubator x 10	30,000	30,000
Incubator building	48,000	48,000
Feed and assorted supplies	10,000	10,000
Personnel	40,000	40,000
<b>Totals</b>	<b>196,000</b>	<b>196,000</b>

## **Budget Narrative**

A coordinator hired by YFA or other recognized non-profit will contract with various hatchery experts to complete negotiations with the state regarding permit and reporting requirements. Approval of contracts to various entities runs through the Borough finance officer or other established fiscal agent. In addition, staff will coordinate the rewrite of the Yakutat Comprehensive Salmon Management Plan (1984) to incorporate the new terminal fishery-operating plan and update management plans on other rivers.

The YFA coordinator will also form a partnership with an established Southeast Alaska Private Nonprofit Hatchery (PNP). A major objective will be contracting appropriate hatchery staff to formulate a business plan and acceptable to state regulators.

Finally, YFA in partnership with the participating PNP will coordinate hiring of a technician crew to perform on the ground duties. These duties include:

### **Securing a sufficient egg supply and shipping eggs to the partner hatchery (air fare, roe stripping, and shipping)**

The table on page 16 illustrates the challenge obtaining enough brood stock to fill the initial net pen. Crews will need to work with ADF&G to establish sliding egg-take scales in all rivers with chum runs. It will likely take a few years to build up an adequate brood stock to remove the need for taking wild stock. Cost are expensive due to remote river access and air shipment of green eggs.

### **Construction and placement of a net pen facility**

Purchase two wave master net pens and nets @ \$30,800/pen or \$72,000.

Shipping costs \$6,000

Personnel time

### **Performing water quality and disease monitoring**

Annual disease and water quality monitoring per ADF&G permit requirements –

Personnel time

### **Feeding, rearing, smolt release**

Skretting Bio-Clarks Feed and delivery costs at \$0.22/Kg equate to roughly

\$13,000 per net pen or 4 cents/fish

Personnel time for feeding

### **Direction of a cost recovery fishery**

Personnel time

### **Straying studies in cooperation with ADF&G**

Personnel time with USFS, CBY and ADF&G biologists

The second phase of the project is to build a small incubation facility at Sandy beach next to the fish processing facility. This will entail constructing a metal building and installing 10 NORAD incubators, each with a 150,000-egg capacity. With Shipping incubators cost

An immediate benefit of the program will be the dispersal of the Situk gill net fleet. This will decrease crowding on the river and allow greater harvests for fishermen who choose to remain on their traditional grounds. The future benefit is the development of aquaculture capacity and expertise locally. In the event of a flooding event, this expertise would enable expansion of the aquaculture contribution maintaining viability of the fleet during the period necessary for ADF&G to rewrite management plans for the Situk.

#### 4.) Yakutat Bay - Salmon Genetics Investigation

**US Army Corps Request \$50,000**

**State request \$50,000**

**City and Borough of Yakutat 1% Salmon Tax \$ 15,000**

##### **Background**

Flooding of the Situk River will likely force the closure of salmon fishing in Yakutat Bay. ADF&G has an estimate for sockeye interception in the Yakutat Bay Gill net fishery and an idea of coho interception by trollers. However, this data is incomplete. To understand the management implications of saltwater salmon fisheries in Yakutat Bay initiation of a three-year genetic study will provide adequate data. The result of this work is a clear picture of stock contribution, by river, to total harvest.

Immediate benefits include answering current management concerns regarding intercept of Yakutat bay fisheries concerning Situk River management plans and transboundary runs in the Alsek River, opening days for outside waters in front of the dangerous river and ongoing changes to the Malispina Foreland fisheries as land rebound alters rivers.

##### **Budget**

Year	Port Sampling	Lab Analysis	Total
1	8,000	30,000	38,000
2	8,000	30,000	38,000
3	8,000	30,000	38,000
Total	24,000	90,000	115,000

##### **Budget narrative**

ADF&G would receive funding to manage the project. Expansion of port sampling hours is necessary to allow time beyond normal sampling duties to collect and ship genetic material. ADF&G run genetic labs receive the remainder of the funding to run the analysis.

Determining the stock ratios in Yakutat Bay will determine the severity of closure time needed during recalibrating of Situk management plans.



## 5.) Yakutat Coastal Learning Center

**US Army Corps Request \$100,000**  
**State request \$100,000**

### **Background**

In 1986 and 2000, scientists set up a base in Yakutat to study the Hubbard Glacier as it was advancing threatening to close the seaward entrance of Russell Fjord. The 2000 Hubbard Glacier research team consisted of approximately six researchers who would go into the field and then operate as best as they could from their hotel rooms or the Forest Service bunkhouses. Along with the Hubbard

Glacier work, harbor seal, sockeye and coho salmon, dogfish, eulachon, and various other investigations began increasing the scientific researcher traffic in Yakutat. This situation spurred on the idea of creating a community science center that visiting researchers could utilize generating revenue for the community.

In 2007, the City and Borough of Yakutat held a special meeting to explore the options for planning a community science center. The area known as the "Little Dock", which is city owned property, was selected as the facility site. The borough formed a steering committee with assistance from the National Forest Foundation in 2009.

The committee meets biannually. An outline of recommendations for the potential site uses include:

- 1.) Small laboratory and computer space for researchers
- 2.) Conference room with video screens for distance learning
- 3.) Interpretive center with natural history displays,
- 4.) A Chamber of Commerce tourism office providing information on local businesses
- 5.) Direct market fish buying, including a fish market for tourists to purchase seafood
- 6.) Hatchery facilities to conduct shellfish and crab research in support of commercial aquaculture and wild fisheries

The implementation of a Coastal Learning and Development Center has potential for a broad range of uses. The center's purpose would include not only performing research supporting the commercial fishing industry and other needs, but also provide education through both formal K-12 and community-based University of Alaska distance learning classes. The center would employ local people to assist research and run classes through video conferencing.

**Partnerships**

The following groups are supporting the learning center's planning process through funding, participating in the steering committee or offers of future assistance

- National Forest Foundation
- Gordon and Betty Moore Foundation
- Army Corps of Engineers – Cold Region Research Laboratory
- US Forest Service
- Department of Fish and Game
- National Park Service
- Yakutat Tlingit Tribe Environmental Program

**Budget**

Action Item	USACE request	State request	Match	Total
Site design with blueprints	40,000	40,00	15,000 (NFF)	95,000
Business plan	15,000	15,000	NA	30,000
Strategic plan	NA	NA	NA	completed
Site preparation	45,000	45,000	200,000 (land value)	290,000
<b>Total</b>	<b>100,000</b>	<b>100,000</b>	<b>215,000</b>	<b>415,000</b>

## **Budget Narrative**

Site design will include a full site survey, ground stability verification and engineered plans for the facility.

A business plan will look at sustainable funding for the facility. Options include negotiations with the University of Alaska to secure video equipment and cover costs incurred to the University for managing the program. Other options could include the shellfish growers' cooperative, the USACE Hubbard research team, The UAF Geophysical Institute (currently renting borough office space) and the proposed aquaculture program. The Sitka Sound Science Center recently garnered 100K in support annually for three years from NSRAA. In addition, the Ketchikan Science Center Oceans Alaska is coordinating with southeast shellfish growers to examine technical issues facing the industry. Finally, the lab in Whittier produces larvae for seeding aquaculture projects

Site preparation would include paving the entire area during the Yakutat Road Paving project scheduled for 2011 and reconstruction on the retaining wall along the rear of the property securing the moraine deposit.

## 6.) Shellfish Aquaculture – Research and expansion

**Army Corps Request \$150,000**

**Native Corporation match \$150,000**

### **Background**

In 2009, the city biologist assisted the Yak-tat Kwaan corporation and the Southeast Shellfish Grower's Association to map out potential oyster growing areas. In 2010, farmers built rafts and baskets and planted the first seed oysters. Growth rates appear strong and there is potential for additional grow out sites.

There is also a demand for crab, scallops, geoducks, pacific littleneck clam and sea cucumbers. In partnership with Oceans Alaska, Ketchikan's science center, the Yak-tat Kwaan, the Alaska Shellfish Growers Association and Sealaska studies on additional aquaculture diversification is possible.

### **Budget**

Action Item	ACOE request	State request	Match	Total
Oyster expansion	75,000	NA	125,000	200,000
Geoduck pilot project	15,000	NA	5,000	20,000
Scallop Pilot Project	15,000	NA	5,000	20,000
Pacific Little Neck pilot Project	15,000	NA	5,000	20,000
Sea Cucumber Pilot Project	15,000	NA	5,000	20,000
Various crab species larval drift and reseedling	15,000	NA	5,000	20,000
Total	150,000	NA	150,000	300,000

## **Budget Narrative**

**Diversification of mariculture:** production by the introduction of simple farming of other organisms in the area of the existing project. The purpose is to build up on proven techniques introduced in the states and to use other simple techniques (i.e., bottom harvesting) to diversify production to enlarge the market prospects for our coastal community. Important aspects like eventual seed production should also be considered in this mariculture diversification objective. Elements related to research, site identification and marketing analysis will be part of the objective.

### **Oyster/Species expansion**

This project involves new techniques and areas for oyster and other species growing.

1. Lentz flop systems – These are newly developed and still in the testing phase. Essentially, the bags are strung between iron poles in the intertidal area allowing the rise and fall of water to raise the bags up and down. The idea is a low maintenance system with well-rounded oyster meat.
2. Tidal Bag Movement – similar to Lentz system, but utilizing deeper water and anchors
3. Clam bed development – Preparation of natural clam beds involves removing large stones from beach sites maximizing growing area. The work is energy intensive to prepare but these sites are easy to maintain
4. Additional Approved Farm Sites – A full inventory of aquaculture sites would be conducted. Some sites may have conflicting uses or special wildlife value. A rating system for each site in the entire bay would be developed. Expansion and potential profit models would be determined to estimate jobs and revenue to replace Situk displacement.

The final objective is to introduce small-scale aquaculture development as a way of generating a significant growth of local production opportunities for coastal communities, at the same time privileging eco-friendly and sustainable practices and favoring the preservation of the natural resources. |

## **POSSIBLE SPECIES DEVELOPMENT**

### **Geoduck pilot project**

1. Locate suitable grow-out sites
2. receive state permitting
3. purchase spat and grow-out tubes
4. evaluate growth rates
5. Determine feasibility for expansion

### **Scallop Pilot Project**

1. Locate suitable grow-out sites
2. receive state permitting
3. purchase spat and approved grow-out medium
4. evaluate growth rates
5. Determine feasibility for expansion

### **Pacific Little Neck pilot Project**

1. Locate suitable grow-out sites
2. receive state permitting
3. purchase spat, predator netting and wild plant spat
4. evaluate growth rates
5. Determine feasibility for expansion

### **Sea Cucumber Pilot Project**

1. Locate suitable grow-out sites under oyster farms
2. receive state permitting
3. purchase larvae and wild plant
4. evaluate growth rates
5. Determine feasibility for expansion

### **Various Crab species larval drift and reseedling**

1. Retain UAF School of Fishery and Ocean Science PhD candidate
2. Provide city vessel for research time
3. Evaluate crab recovery rate for Yakutat Bay for King, Snow and Dungeness Crab
4. Evaluate Hatchery options for reseedling wild stock