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Economic Review of 2011-2012 Food & Bait (ZM) Herring Fishery

Prepared for: Herring Conservation & Research Society

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Table of Contents

Introduction

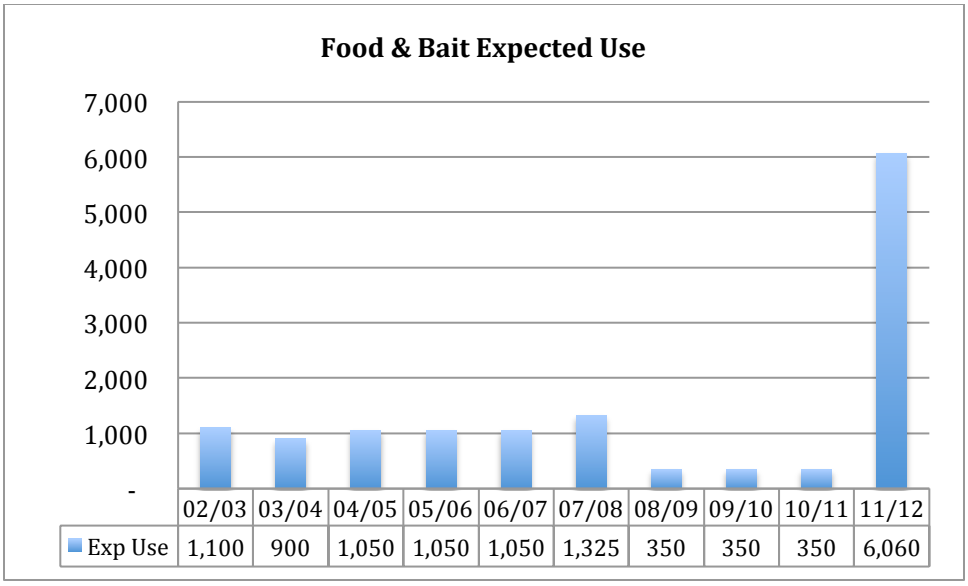
The Herring Conservation & Research Society (HCRS) has contracted Stuart Nelson of Nelson Bros Fisheries Ltd (the contractor) to perform a brief Economic Review of the 2011-2012 Food & Bait (ZM) Herring Fishery. The study includes four primary areas of investigation, as outlined in the Terms of Reference document:

1. The market/product side of the business.
2. An assessment of the economic parameters of the fishery.
3. A comparison of the ZM fishery to the roe herring fishery.
4. A listing of measures that may increase the viability and level of economic benefits of the fishery in the future.

This report summarizes the findings of the contractor over the two-week duration of the investigation.

Background

The Food & Bait fishery has featured relatively low allowable catch and harvest levels in recent years. For the 2011-2012 season, a substantially higher expected use tonnage was set.



The rationale for the increase was twofold:

- To exploit perceived market opportunities for food and bait products.
- To better utilize the total available herring TAC; after all expected uses were provided for, there was still a substantial balance of unused TAC. A higher Food & Bait allotment would at least partially fill this gap.

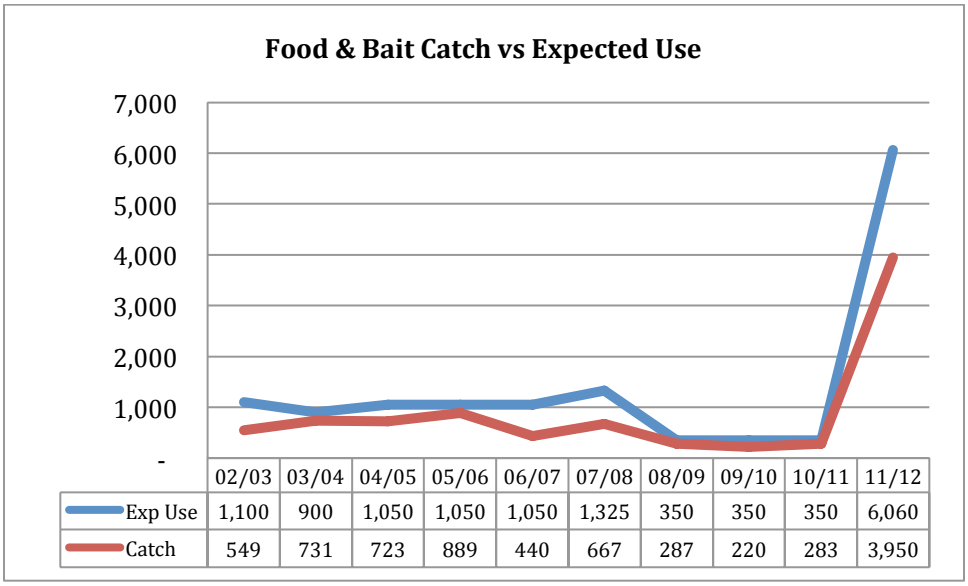
Management measures for the 2011-2012 season included:

- A 6,060 short-ton TAC, with 6,000 tons coming from the Strait of Georgia.

- A licensing system whereby eligible vessel owners and HS license holders would access the fishery through a ZM licence under a lottery system, with 100 60-ton opportunities drawn randomly.
- Ability to "stack" food & bait licences on eligible vessels (no limit).
- An industry-funded catch monitoring system including 100% at-sea and dockside validation.
- A fishing season from November 7, 2011 to February 9, 2012.

The fishing season is recounted in detail in the draft document "Food and Bait Herring Fishery 2011/2012 Season Report, Fisheries and Oceans Canada Fisheries Management, April, 2012. For the purposes of this study, the key factors are:

- Actual catch of 3,950 tons, representing a substantial increase from prior years.



	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12
Exp Use	1,100	900	1,050	1,050	1,050	1,325	350	350	350	6,060
Catch	549	731	723	889	440	667	287	220	283	3,950

- Receipt by DFO of some expressions of concern regarding the increased scale of the fishery, particularly around potential impacts on "local stocks."
- Interest in both government and industry circles about the success of current-year product/market initiatives, and growth and diversification prospects.

A larger-scale Food & Bait fishery—especially if a more permanent program, potentially involving a higher TAC, is developed—raises management issues for DFO, and could provoke debate over the allocation of herring stocks between the seine (HS) and gillnet (HG) sectors.

This study is intended to provide stakeholders in the herring fishery with intelligence on the economic parameters of the 2011-2012 Food & Bait fishery to help inform their deliberations on the future design and scope of the fishery.

Consultations and Research

In keeping with the short duration of this study, a focused information-gathering methodology was used. Sources of information include:

- Discussions with representatives from the three firms most involved with buying and processing this years' harvest.
- Discussions with, and review of materials provided by, DFO fishery management staff.
- Discussions with HCRS staff.
- Attendance at an April 20, 2012 Herring Industry Advisory Board (HIAB) meeting.
- Internet search for herring information, particularly herring fisheries in other jurisdictions.

Information collected was analyzed, synthesized, and reported-upon by the contractor.

1. Market & Product Information

In this section, market-related information on Food & Bait herring is summarized.

Context of the BC Food & Bait Herring Fishery

Although the BC Food & Bait herring fishery grew dramatically in volume to 3,950 tons, this harvest level is miniscule relative to the scale of global herring fisheries.

The North Atlantic features a variety of herring stocks, and supports fisheries on both sides of the ocean. Herring fisheries on the east coast of Canada and New England are on the order of 300,000 tonnes per year.

The current east Atlantic herring TAC (per the European Union "Fishing TACs and Quotas 2012) is over 1.5 million tonnes. The primary stock is the Atlanto-Scandian stock. This quota is divided amongst EU and non-EU members (including Iceland), and further organized amongst regional fisheries and fleets. A number of purse seine or pelagic trawl fisheries are MSC certified including:

- Norway North Sea and Skagerrak Herring (105,000 tonnes).
- Danish Pelagic Producers Organisation Atlanto-Scandian Herring (32,000 tonnes).
- Pelagic Freezer-Trawler Association North Sea Herring (70,000 tonnes).
- Scottish Pelagic Sustainability Group Ltd North Sea Herring (15,000 tonnes).

Atlantic herring are larger-size than Pacific herring, and European producers have been cultivating food products and markets in Europe for hundreds of years. The Iceland Ministry of Fisheries and Agriculture estimates that half of the Atlantic harvest is converted into products for human consumption, with the balance sold as feed for domestic animals (often, reduced into fishmeal and oil).

A sample North Sea herring marketer, Fresh Catch (Scotland) offers an array of herring products that includes: headed and gutted (tail on or off), graded flaps, singles, skinless fillets and pieces, deli herring, marinated herring, and roe.

As BC herring producers contemplate expansion and diversification of products and markets, they face key competitive realities with respect to their positioning in the global business:

- Atlantic herring are larger in size, and better suited to some food product forms (such as fillets).
- Regardless of the extent to which the BC Food & Bait herring fishery is ramped-up, volumes will be dwarfed by global supplies. Atlantic producers will enjoy a cost advantage associated with economies of scale.
- The European Union is major market for herring products, and Atlantic producers clearly enjoy a competitive advantage (cost, product attributes) in servicing this market. They also have an enormous head start. Similarly, East Coast USA markets will be best served by East Coast herring fisheries.
- BC Food & Bait herring cannot be caught for reduction purposes (as prescribed by regulation), eliminating this potentially attractive market avenue.

With this context provided, a summary of current market initiatives for BC Food & Bait herring is next offered.

BC Food & Bait Herring Products & Markets

Information on current and planned market/product initiatives for BC Food & Bait herring was furnished by three sources, with each source taking a proprietary inclination towards its initiatives.

A general "take" on the use of BC herring for uses other than roe is that in today's global marketplace there is a strong demand for protein, and all pelagic fish are legitimate protein sources; there is no rationale for available fish stocks to go un-utilized in this market environment. Indeed, herring, as a good sources of omega 3 fatty acids and vitamin A, is extremely nutritious. BC producers also recognize that while they are at a competitive disadvantage to East Coast and EU producers in the East Coast of North America and European markets, they have proximity and enjoy freight-cost advantages in servicing Pacific Rim markets; this business sphere is the focus of current initiatives. The quality of BC herring is also deemed to be superior to that taken in larger, industrial-scale fisheries. Few, if any, competing herring fisheries feature fishing grounds that are a scant few-hour run to a major processing centre.

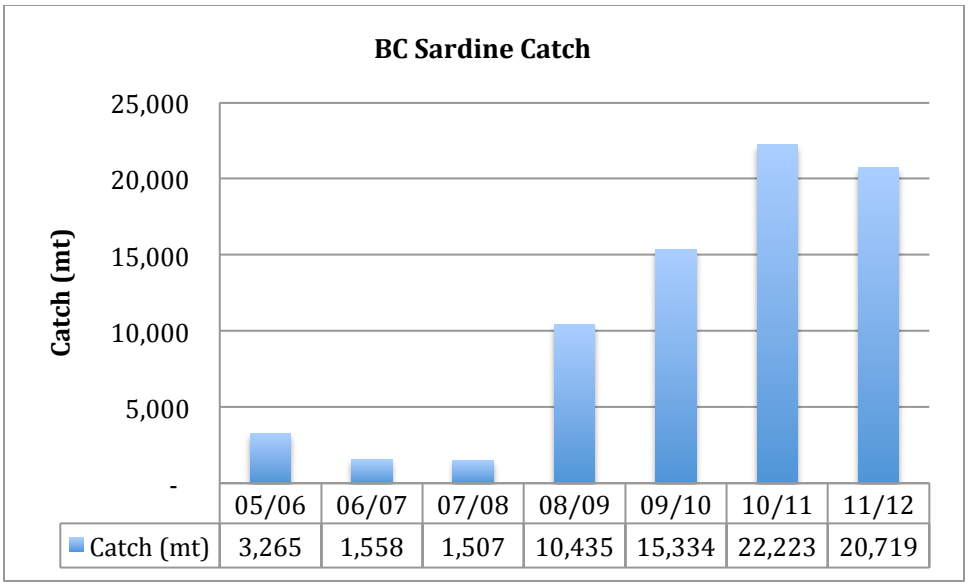
The 2011-2012 Food & Bait season was definitely viewed as an opportunity to test-market the herring in a variety of product forms, for a variety of uses, and in a variety of markets.

The following table represents an attempt to convey more specific market-related information while preserving the confidentiality of specific initiatives.

Area	Initiative
Product Handling	Product was caught in modest-sized sets (average about 50 tons). Fish generally harvested at night and delivered into Lower Mainland in the early morning. Product frozen promptly upon arrival at plant.
Product Quality	Buyers were reported to be extremely pleased with product quality. The harvesting and processing pattern allowed for outstanding quality.
Herring Size	The use of the fish depends upon the size. Potential size grades: >100 grams, 80-100 grams, 60-80 grams, <60 grams.
Human Consumption: Products	Herring is often used as a substitute for sardines in canned sardine products. BC herring can be frozen for subsequent canning in Asian locales (Thailand, China). Product forms for BC product include whole IQF frozen, and HT (headed and tailed). There is potential to use large fish for value-added products such as fillets and butterfly, utilizing special-purpose machinery, or modifying existing equipment. Potential markets include Korea and Japan.
Animal Consumption: Products	Some product used for feed in aquariums (block frozen product). Some product suited for feed in tuna farms (nude blocks) in the Mediterranean and Australia. Pet food may provide market avenues.
Reduction Opportunities	Meal and oil markets can provide attractive returns, but this avenue is currently precluded by regulation.
Pricing	Prices by product, by market are proprietary, but for many product types are in the $600-650 per ton range. For selected products and market prices may exceed $800/ton.
Buyer Feedback	It is reported that, for virtually all products and market segments, feedback from customers was very positive, and there is a keen interest in repeat business.

The firms involved with purchasing, processing, and selling the subject years' Food & Bait herring production seem satisfied with the results seen during the pilot year, and optimistic that if a supply of fish is secured, customer relationships can be nurtured and grown. They advise that market and product development is an iterative process, that requires multiple seasons and may involve substantial trial and error.

A parallel is drawn with the BC sardine fishery, which languished for many years due to rules that rendered harvesting operations un-economic, but has blossomed in recent years.



Given a supportive fishery management regime, the volume of sardines harvested and marketed has grown dramatically over the last five years.

2. Economic Activity Associated with the Food & Bait Herring Fishery

In this section an assessment of the level of economic activity generated by the 2011-2012 Food and Bait Fishery—both at the fleet level and processing level—is provided. Two positives associated with the fishery are:

1. The economic activity arising from the fishery is incremental to the fishing industry and economy.
2. The Food & Bait herring season falls at a time in the year (November-February) when the bulk of harvesting and processing assets, and the crews that man them, are idle. The fishery represents a chance to improve asset utilization and extend employment opportunities.

More detailed estimates of the dollar-volume of economic activity are provided next. For presentation purposes, the processing and harvesting sectors are viewed separately, though in practice there is considerable overlap between the functions.

Processing Level

At the processing (or wholesale) level, fish is purchased from the licensed vessels, processed, and sold on the wholesale market. The *estimated* revenues and costs arising from this activity for the 2011-2012 fishery are shown in the following tables; the first table shows unit (per ton) values, while the second shows an extrapolation to arrive at aggregate values for the fishery[1].

Item	Value/ton
Selling price	**$650**
Production Costs:	
Fish cost (price to vessels)	150
ZM licence lease	20
EI, WCB	10
Ice	20
Unloading	60
Truck to plant	20
Processing & packaging	325
Total production cost	**605**
Gross Margin	**$45**

Item	Amount
Tons	3,950
Selling price/ton	$650
Revenue	**$2,567,500**
Production Costs:	
Fish cost (price to vessels)	592,500
ZM licence lease	79,000
EI, WCB	39,500
Ice	79,000
Unloading	237,000
Truck to plant	79,000
Processing & packaging	1,283,750
Total production cost	**2,389,750**
Gross Margin	**$177,750**

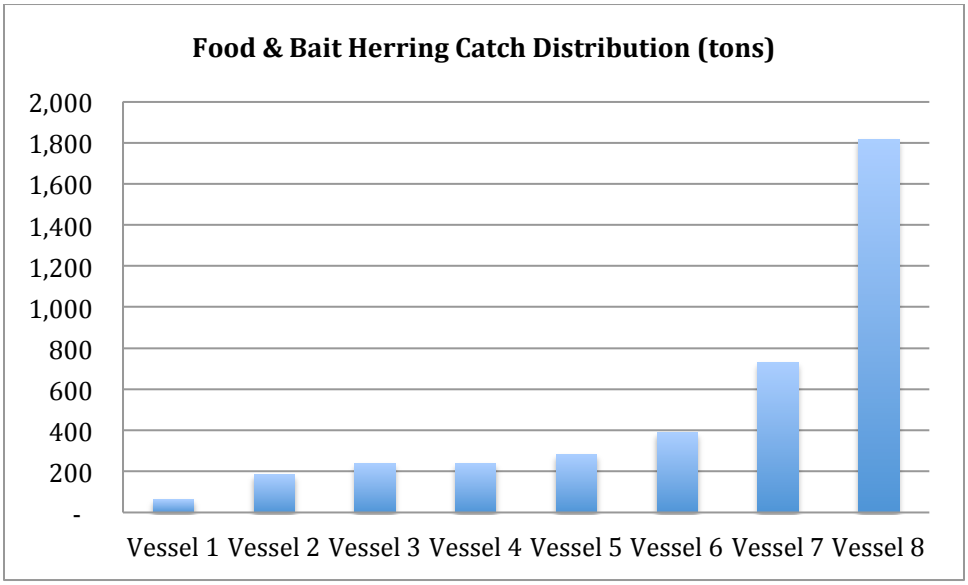
For the 2011-2012 season, the Food & Bait herring was a relatively low-value activity that likely generated a small contribution margin at the wholesale level. If management and administration/overhead costs were factored in, the fishery likely broke-even or incurred a small loss. Given the speculative and experimental nature of the season from a product and market perspective, processors were generally satisfied with this financial outcome.

[1] Values are rough estimates based on interviews and the judgment of the contractor.

The scope of the 2011-2012 fishery was sufficient to generate material economic activity. The wage component of the $2.4 million production cost is likely in the $1.3 million range.

Harvesting Level

Eight vessels recorded Food & Bait herring landings in the 2011-2012 season, implying an average catch per vessel of 494 tons. The landings pattern was highly skewed, however, with the "average" statistic having little relevance.



Given the small fleet size and un-even catch distribution, no attempt is made to report individual vessel financial results. Rather, a rough estimate of aggregate results for the fleet is provided.

Food & Bait Herring Fleet	Value
Landings (tons)	3,950
Vessel Price (per ton)	$150.0
Gross Revenue (Gross Stock)	**$ 592,500**
Less: Fishery Specific Expenses	
Fuel	135,000
Catch Monitoring	60,000
Licence Fees	1,950
Gear repairs	50,000
Total Fishery Specific Expenses	246,950
Net Revenue (Net Stock)	**345,550**
Less:	
Crew Share	241,885
Fishery Contribution (Boat Share)	**103,665**

At the harvesting level Food & Bait herring is a low-value activity characterized by:

- Modest margins (boat shares) that provide a contribution toward fixed expenses such as insurance and annual maintenance, but would not alone support a vessel's annual operations.
- A higher percentage of net revenues directed to crews, since this is a labour intensive fishery (many daily fishing trips).

The herring Food & Bait fishery can be compared to the hake fishery in key respects. In the shore-based hake fishery, vessels deliver daily to the plants over the course of a several-month season. No single fishing trip is highly profitable, but when a seasons-worth of trips are accumulated, the results can be highly satisfactory. While shore-based hake fishing stated out as a low-priced, marginal activity, over time product and market development initiatives have borne fruit, and prices have risen and profitability improved. Hake has benefited from the same macro-trend that can apply to BC herring—a growing demand for fish protein, especially when sourced from sustainable fisheries.

3. Comparison to the Roe Herring Fishery

The Terms of Reference document called for a "costing model" comparing the production costs of Food & Bait herring to roe herring. Providing a quantitative model, however, is problematic:

- The revenues and costs provided in this paper are estimates based on a single pilot season only.
- No recent roe herring data is available on the harvesting side, and information on processing costs is proprietary.

It is deemed that providing a qualitative comparison is more meaningful than a quantitative one that is based too heavily on guesstimates and a paucity of data.

The following comparison is offered:

Area	**Food & Bait Herring**	**Roe Herring (Seine)**
Nature of Fishery	A long protracted fishery. Season typically consists of a series of daily deliveries.	A brief, intense fishery. Season often consist of "one set."
Season	November – February	March
Ex-vessel price	Low.	Higher (though not like the old days!).
Catch Monitoring	100% at-sea, 100% DMP More costly. CM a far greater burden for Food & Bait given fish prices and long season duration.	Hails, 100% DMP Less costly.
Harvesting Economics	Economics are premised on volume, not price. Multiple trips required to round-out a season.	Economics based on efficiency (getting a load of reasonably priced fish in a short time).
Licence costs	$30.	$3,980 (full fee).

Licensing, Fishery Organization	ZM licence. Licences issued to eligible vessels via lottery; 60 ton quota per vessel. Unlimited stacking allowed.	HS licence. Pool fishery; vessels in each area receive same quota; maximum 2 licences per vessel (subject to special exemptions).
Vessel/Crew Division of Earnings	High ratio to crew, given labour intensive nature of fishery. Boat earnings are not the primary consideration (a contribution is welcome).	Higher ratio to vessel. Roe herring is a "core" activity for many vessels.
Processing costs	Daily freezing in small batches implies modest costs.	Processing roe (thawing, popping, pailing) a much higher cost activity.
Market Considerations	Small current market with growth potential. Currently, low values.	Mature (shrinking?) market, extremely sensitive to catch volumes. Much lower price levels now than were seen in the past. Roe fishery still the primary consideration in the herring fishery (HIAB).
Economic Stature	Small, but with growth potential.	Much larger than Food & Bait, but trending downward.

Considering the above points, a summary view of the two fisheries is offered:

- The roe herring seine fishery, for many years a highly lucrative activity, has been in retreat for the past several seasons. Industry is striving to align costs with a diminished revenue level in order to preserve an attractive measure of profitability. While this is by no means a growth industry, there remains the potential to earn positive returns for the foreseeable future. Giving up on the fishery is not an option.
- The Food & Bait fishery, featuring scant volumes in recent years, featured a vastly increased catch volume in 2011-2012. Some stakeholders, accustomed to the greater margins earned in the roe fishery, doubt the validity of this business opportunity. While the roe fishery remains the priority of industry, the growth potential of the Food & Bait herring fishery—considering the recent parallel growth in the hake and sardine fisheries—is compelling.

4. Measures to Increase Benefits & Viability

For any business, improved profitability and generation of economic benefits can be linked to three factors:

- Improving revenues.
- Lowering costs.
- Improving efficiency and flexibility.

Within each category, there are a host of measures that could be adopted. For a fishery to be successful, a supportive policy environment is necessary, so that industry can implement performance-enhancing initiatives and support investments.

A number of policy-related suggestions for addressing the performance of the Food & Bait herring fishery were heard by the contractor during this review. They include:

Improving Revenues

- Lengthening the Food & Bait season, potentially on both ends of the season (though the potential conflict with the roe fishery is recognized).
- Confirming an allocation of fish to the fishery with sufficient notice. Companies are loath to invest in product and market development initiatives without assurance that a supply of fish will be available. "Securing" the herring TAC for the commercial fishery is another consideration. It is felt by some that if the herring industry continues to under-utilize its allowable harvest, other users—potentially outside the licensing framework—could gain access. The Food & Bait fishery provides an avenue for full herring TAC utilization without flooding the roe market.

Lowering Costs

- The comprehensive monitoring program represents a large cost to industry relative to the value of this years' harvest (about 10% of landed value). There is a view that the Food & Bait sector can ill afford a program that is more comprehensive than the roe sector. There was sentiment that equity between seine herring fisheries would be in order.
- For most Food & Bait participants, entry to the ZM fishery is closely linked to HS licences. The cost to renew an HS licence is $3,980, an amount that most participants consider out of touch with the current value of the fishery.

Improving Efficiency and Flexibility

- ZM licences have been awarded through a lottery system. By nature, such a system confounds pre-season planning and necessitates transfers of licences amongst vessels. A view was expressed that the lottery system should be scrapped and each HS licence should gain access to the Food & Bait herring fishery.
- Growing the Food & Bait fishery brings allocation concerns, as many HS and HG holders believe their licences should provide them access to all commercial herring fisheries. If the Food & Bait fishery continues to grow, HS and HG licences holders may feel disenfranchised. The HG sector could assert that it is entitled to 45% of the Food & Bait expected use allocation.

It is recognized that each of the above-noted measures to potentially enhance revenues, lower costs, or improve efficiency, brings countervailing arguments and practicalities that must also be considered.

Summary

The abundance of Strait of Georgia herring stocks, resulting in sizeable allowable harvests, combined with the challenging state of the Japanese herring roe market, creates a dilemma for the herring industry. The strategy of restricting the harvest of roe herring to try to solidify the market price in Japan results in surplus (unused) TAC. Consistently failing to utilize TACs for a commercial species brings the risk that other stakeholders may attempt to access the stock. Conversely, setting too-high a roe herring TAC could erode the remaining viability of the roe herring business.

Allocating a greater portion of the "unused" TAC to the Food & Bait herring fishery represents a potential solution to the dilemma: utilizing otherwise foregone fish, and keeping the benefits within the BC herring industry.

However, an expanded Food & Bait herring fishery also stimulates some issues, from within the industry (who will "own" the allocation?) and without (need for adequate science to evaluate potential biological implcations).

The 2011-2012 pilot fishery provided a chance to test the premise that an expanded Food & Bait herring allocation could be:

- Harvested efficiently and sustainably.
- Processed into saleable product forms at reasonable cost.
- Sold to customers worldwide.
- Profitable (or at least provide a financial contribution) for participants.

The 2011-2012 Food & Bait generally met these conditions, and generated substantial economic activity from a previously un-utilized resource, using fixed assets and human resources that would otherwise be idle.

The Food & Bait herring fishery would appear to share many elements (relatively low values, but high volumes and a lengthy fishing season) with the hake and sardine fisheries, both of which started as small "fringe" activities and have evolved into core fisheries for the BC fishing industry.

The encouraging level of success seen in the 2011-2012 Food & Bait fishery should prompt the herring industry to address it's internal and external challenges, so that a promising fishery can be given an opportunity to develop.