

Fall 2015

Sockeye Market Analysis



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Sockeye Market Analysis *Fall 2015*

Prepared for:

BBRSDA

(Bristol Bay Regional Seafood Development Association)

Prepared by:



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Executive Summary

Bristol Bay Regional Seafood Development Association (BBRSDA) is tasked with increasing the value of Bristol Bay sockeye and has contracted with McDowell Group to produce bi-annual sockeye market reports. These reports analyze market conditions for sockeye products, investigate market issues, and discuss the impact on Bristol Bay fishermen.

Bristol Bay has long been known for volatility and the contrast between the 2014 and 2015 seasons underscores that reputation. The 2014 season marked the fourth consecutive year of base sockeye prices above \$1/lb. With a harvest of 29 million fish and new processors entering the fishery, Bristol Bay appeared to be on a roll; firing on all cylinders and producing strong earnings.

The 2015 season has proven a sharp contrast to that picture. Despite a massive return of 58 million sockeye, preliminary ex-vessel earnings are below \$100 million for the first time in a decade as base price for sockeye dropped from the four-year average of \$1.17/lb to just \$0.50/lb. An ex-vessel price decline of nearly 60 percent in a single season is unusually steep. Obviously, this raises the question of “what happened?” and merits a more detailed discussion beyond the normal scope of this market analysis.

It is not the intent of this document to justify the 2015 base price or pass judgement on whether it represented a fair price. There is no definitive answer to these subjective questions. Rather, the goal is to provide insight into the pricing process, factors involved in pricing, and contextual information so as to facilitate productive discussions on how BBRSDA might accomplish its mission.

Ex-Vessel Market Analysis for Bristol Bay Salmon Harvesters

For reasons outlined above, the structure of this report has been altered to methodically address key questions and issues central to the business of Bristol Bay salmon fishermen. Short answers to these questions are provided below. Detailed analyses for each issue are available in the body of the report. Unless otherwise noted, findings and figures apply to the Bristol Bay sockeye fishery.

How do processors determine ex-vessel prices? (See page 11 for more information).

Bristol Bay processors generally follow a similar process to estimate the ex-vessel price which best suits each company’s short-term and long-term goals. Harvest volume/timing, advance sales contracts, wholesale market conditions, production goals, competitive landscape, inventory positions, processing capacity, operating/financing costs, and risk assessments all factor into the initial base price offered to fishermen. First wholesale prices are highly influenced by Bristol Bay harvest volume, so processors typically avoid posting prices until fishing is under way and they have a reasonable expectation of market supply.

How does the fishery's structure, remote location, processing capacity, harvest volume, and product quality impact ex-vessel price? (Page 12).

Ex-vessel prices for Bristol Bay sockeye are significantly influenced by the fishery's structure, remote location, processing capacity, and market-setting harvest volume. These structural elements and other annual variables occasionally create a captive supply for processors, at least in the short-term. However, in the long-run ex-vessel prices adjust to competitive forces. New processors and direct marketers face substantial barriers to entry, but the challenges are not insurmountable as evidenced by new participants entering the region in recent years.

The value of quality bonuses have been largely unaffected by changes in ex-vessel price, as quality incentives are a function of consumer demand for higher grade product. Fishermen can realize a higher final ex-vessel price by earning bonuses for chilling their fish and implementing other onboard handling practices such as bleeding, fish slides, brailer-bag weight limits and full-immersion chilling. The practical result is that quality bonuses have a greater percentage effect on gross vessel revenue when ex-vessel price is low. However, improving quality creates additional costs for both fishermen and processors.

What other variables impact ex-vessel price? (Page 14).

The relationship between supply and demand is impacted by variables which change from season to season, impacting ex-vessel and first wholesale prices. The relative impact of each variable changes from year to year, but expected harvest volume, wholesale price levels/trends, and inventory positions usually have the biggest impact on ex-vessel price. In 2015, a host of other factors also negatively impacted ex-vessel prices, including currency exchange rates and smaller fish sizes.

What happened with ex-vessel price/value in 2015 and how does it compare to first wholesale price/value (page 15), sockeye supply (page 19), price/value in other sockeye fisheries (page 20), and prior seasons? (Section begins on page 15).

The relationship between ex-vessel and first wholesale price/value favored fishermen in 2014, who received a larger share of ensuing first wholesale prices and a significantly larger share of total first wholesale revenue. In 2015, the base ex-vessel price fell substantially, as did the percentage of first wholesale price paid to fishermen (based on initial sales of 2015 production, see Table 1 on following page). The final percentage of first wholesale value paid to fishermen for the 2015 harvest season will change as bonus/adjustments and additional processor sales data are factored in next spring, but preliminary figures suggest the percentage will be well below levels seen in prior years.

Lower than expected first wholesale prices contributed to fishermen receiving a higher share of first wholesale revenue in 2014. The relationship was also impacted by increasing inventories of unsold production, which will eventually be converted to revenue for processors, likely at lower prices than were anticipated when raw material was purchased.

See table on following page.

Table 1. Ex-Vessel versus First Wholesale Price and Revenue, Bristol Bay Sockeye, 2006-2015

Harvest Year	Base BB Ex-Vessel Price	Final BB Ex-Vessel Price	Avg. First Wholesale Value/lb.	Base Ex-Vessel Price as Pct. of First Wholesale Price	Final Ex-Vessel Price as Pct. of First Wholesale Price	Harvester Share of Total First Wholesale Sales Revenue
2006	\$0.55	\$0.66	\$2.25	24%	29%	46%
2007	0.62	0.67	2.45	25%	27%	45%
2008	0.68	0.75	2.95	23%	25%	42%
2009	0.70	0.80	2.97	24%	27%	42%
2010	0.95	1.07	3.37	28%	32%	46%
2011	1.00	1.17	3.99	25%	29%	43%
2012	1.00	1.18	4.01	25%	29%	45%
2013	1.50	1.61	5.31	28%	30%	51%
2014	1.20	1.34	4.06	30%	33%	73%
2015	0.50	N/A	3.01	17%	N/A	N/A

Notes: First wholesale sales price/revenue refers to the value of Bristol Bay sockeye products sold between May of the harvest year and April of the following year, roughly approximating the annual wholesale sales cycle. First wholesale value for 2015 only reflects product sold between May 2015 and August 2015. Comparing ex-vessel price per round pound to first wholesale value per processed pound does not reflect the share of total first wholesale revenue retained by fishermen, gross revenue figures for both sectors have been similarly compared to estimate harvester share figures (see far right column).

Source: ADF&G and ADOR (ASPR), compiled by McDowell Group.

Bristol Bay sockeye prices are highly correlated with the region's harvest volume. Statistical analysis shows an inverse correlation of 83 percent between the region's sockeye harvest volume and ex-vessel prices over the past ten years (2006-2015). Larger Bristol Bay harvests often coincided with lower prices.

Ex-vessel prices for Bristol Bay sockeye were significantly lower, relative to other Alaska regions, in 2014 and 2015. Much of this difference can be attributed to larger Bristol Bay harvests during the last two seasons. While prices were lower, the combined total ex-vessel value of Bristol Bay sockeye in 2014 and 2015 increased more than any other major sockeye-producing region in Alaska.

Despite low prices in the 2015 season, the average ex-vessel value over the past two seasons will likely be on par with the previous four year average. The relative value of chilling Bristol Bay sockeye was greater in 2015, as most processors reportedly held quality bonuses constant despite offering a much lower base price.

Where do Bristol Bay sockeye products go (page 26) and how are they impacted by the value of the U.S. dollar (page 36)?

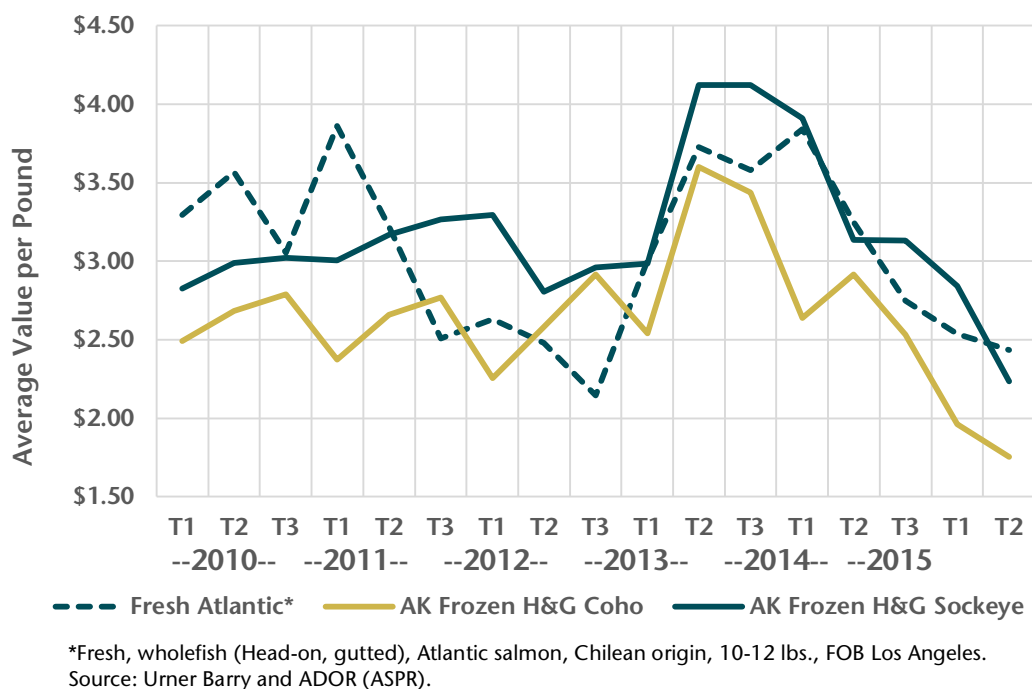
Bristol Bay sockeye products are predominantly sold to export markets. Japan, Europe, and Canada are the largest foreign buyers, although the U.S. is typically the largest single market.

Prices for Alaska sockeye products have been negatively impacted by a stronger U.S. dollar in recent years. A more valuable (i.e. stronger) dollar generally makes Alaska seafood products more expensive and competing product less expensive from foreign consumers' point of view. The value of relevant foreign currencies declined between 18 and 49 percent over the past 24 months.

What is the status of wholesale market conditions for key Bristol Bay sockeye products and other competing salmon products? (Page 29).

Wholesale prices for all key sockeye products declined 23 to 43 percent between early-2014 and mid-2015. Prices for farmed Atlantic salmon and wild coho salmon are experiencing similar declines (see Figure 1). Lower prices are due to larger sockeye harvests in Canada (2014) and Bristol Bay (2014/2015), a stronger U.S. dollar, and the Russian import ban on U.S. and Norwegian seafood products. Smaller fish size from recent Bristol Bay harvests have also resulted in lower average prices (across all sizes) for frozen H&G Alaska sockeye.

Figure 1. Average Wholesale Price per Pound of Selected Salmon Products, by Trimester, 2010-2015



Sales volume of sockeye products at the wholesale and retail level have increased in 2015 since similar periods in 2014, particularly for frozen H&G product. Canned sales have increased but not enough to offset the impact of large recent harvests volumes. The resulting inventory of canned sockeye is especially problematic.

Is the retail sector moving larger volumes to avoid inventory issues heading into next season? (Page 37).

It is too early in the sales cycle to definitively answer the inventory question; however, U.S. retail sales and export figures are encouraging.

The volume of sockeye fillets sold at U.S. grocery stores is up 25 percent in 2015, and the canned sockeye category is up 9 percent. Increased sales volume is primarily due to an increase in promotion and lower prices. The volume of canned sockeye sold through promotional pricing or other merchandising efforts has tripled thus far in 2015, and is up 31 percent for random-weight sockeye products (mostly fillets).

Further, U.S. sockeye exports following the Bristol Bay season (July-September) are up 51 percent in 2015 over the same period last year. Exports of frozen H&G sockeye increased 81 percent, while year-to-date export volumes of canned sockeye increased 16 percent.

How much do changes in retail prices lag behind wholesale prices? (Page 38).

An analysis of retail sales data suggests that retail prices of sockeye fillets and canned sockeye are fairly responsive to wholesale prices, so long as the shift in wholesale price is not too dramatic. However, retail prices have not declined nearly as fast as wholesale prices over the past year for several reasons discussed in the body of this report.

What is the impact of lower ex-vessel prices/value on permit values? (Page 42).

Historically, there has been a strong link between ex-vessel value of Bristol Bay sockeye and the value of Bristol Bay driftnet permits. The analyses suggest there is a generally consistent relationship between permit values and both the ex-vessel price and total value of Bristol Bay sockeye. Wholesale prices for frozen H&G sockeye have also been a leading indicator of permit values in recent years. The value of Bristol Bay driftnet permits has declined in recent months, consistent with declining ex-vessel and first wholesale prices.

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Glossary of Terms and Abbreviations

Abbreviations and Acronyms

ADOR	Alaska Department of Revenue
ADF&G	Alaska Department of Fish and Game
ASMI	Alaska Seafood Marketing Institute
ASPR	Alaska Salmon Price and Production Reports (published by ADOR)
BBRSDA	Bristol Bay Regional Development Corporation
COAR	Commercial Operators Annual Report (published by Alaska Dept. of Fish and Game)
DFO	Canadian Department of Fisheries and Oceans
FAO	United Nations Fisheries and Aquaculture Organization
H&G	Headed and gutted
MSC	Marine Stewardship Council
NMFS	National Marine Fisheries Service
PACFIN	Pacific Fisheries Information Network

Glossary of Terms

Ex-Vessel Value/Price	The value or price paid to fishermen by a processor for whole fish.
First Wholesale Value	The value (or average price) of processed product sold by a processor to an entity outside of their affiliate network. Typically refers to the value of product as it leaves Alaska.
Round Weight	The weight of a whole fish as it is delivered to the processor in an uncut and unprocessed state.
Annual Sales Cycle	Refers to the approximate period following a salmon harvest season when most salmon product is sold by processors to wholesale markets. Since data from the ASPR is released and aggregated into four-month periods (trimesters), the sockeye sales season runs from May of the harvest year through April of the following year. The majority of sockeye products produced during the harvest year are sold in the first wholesale market during this period (reflecting sales in trimesters two and three of the harvest year, and the first trimester of the following year). Aligning the data by sales season, as opposed to calendar year provides a better basis for comparing first wholesale data to ex-vessel data.
Gross Processing Profit	The difference between first wholesale revenue earned by primary processors during the annual sales cycle, less ex-vessel payments to fishermen during the corresponding period.
POP data	Point-of-purchase (POP) data includes retail sales of sockeye and other salmon products in U.S. grocery stores from IRI, Inc.'s network – which includes virtually all U.S. grocery chains.
Fixed weight sales	Refers to retail sales of products which are sold as a fixed weight product, as opposed to prices which vary based on the product weight.
Random weight sales	Refers to retail sales of products which are priced according to the variable weight of the product being purchased.

Introduction and Data Sources

The Bristol Bay Regional Seafood Development Association (BBRSDA) has commissioned McDowell Group, Inc. to analyze sockeye markets and report findings bi-annually since fall 2013. This is the fifth report in the series.

In business since 1972, McDowell Group is Alaska's most experienced research and consulting firm. McDowell Group has served as a market-research contractor for the Alaska Seafood Marketing Institute for the past 16 years and has conducted market research, feasibility studies, and other seafood industry-related projects for public and private sector clients throughout Alaska and elsewhere in North America.

Study Purpose and Scope of Work

BBRSDA represents the world's largest group of sockeye fishermen and is tasked with increasing the value of Bristol Bay sockeye. In addition to bi-annual reports, the *Sockeye Market Analysis* project includes summary presentations, documents, and video materials at the direction of BBRSDA Board and staff during the fall and spring. The project tracks important trends affecting sockeye salmon to help BBRSDA direct promotional efforts, inform its members, and react effectively to emerging issues and trends.

Methodology and Data Sources

McDowell Group compiled data from government agencies, including the Alaska Department of Fish and Game (ADF&G), the Alaska Department of Revenue (ADOR), and export data from the National Marine Fisheries Service (NMFS). Point-of-purchase (POP) data was purchased from IRI, Inc. to inform the retail market analysis. McDowell Group also conducted several executive interviews with industry contacts.

Findings in this report rely heavily on public data sources, compiled from published sources and custom data requests. Ex-vessel data benefits from the existence of fish tickets, which document transactions between fishermen and processors. First wholesale data is not based on individual transactions, but is self-reported by processors in an aggregated form to state and federal agencies. These submissions are cross-checked against each other to find potential errors, omissions, and other outliers; however, a comprehensive audit of first wholesale data is not feasible due to a lack of comparable data and budgetary constraints. Although first wholesale data represents self-reported information, McDowell Group found general trends in first wholesale volume, value, and pricing are consistent with trends observed in other data sources such as export data, trade press reports, and subscription-based pricing services. Further, comparisons of harvest volume and ex-vessel value also suggests first wholesale data pertaining to Alaska salmon collected by State agencies provides an accurate depiction of market conditions in the first wholesale market.

Specific data sources used in this report are summarized below:

ADF&G Fish Ticket Data

Bristol Bay fish tickets often contain no documentation of ex-vessel price or value for salmon. However, in cases where ex-vessel price has been omitted from fish tickets an average price is applied to the harvest volume based

on information collected by fishery biologists in each region. More information about ADF&G fish tickets can be found at: <http://www.adfg.alaska.gov/index.cfm?adfg=fishlicense.fishtickets>.

ADF&G Commercial Operators Annual Report (COAR)

The first buyer of raw fish, persons who catch and process fish, and persons who catch and have fish processed by another business are required to file an annual report of their purchasing and processing activities. This report is called the Commercial Operator's Annual Report (COAR) and is due by April 1 of the following year. Historical COAR data extending through 2014 is used as a supplementary information source in this sockeye market analysis.

The COAR reports contain data on seafood purchasing, processed production volume, and both ex-vessel and wholesale values of seafood products. The buying information from COAR is reported by species, area of purchase, condition of fisheries resources at the time of purchase, type of gear used in the harvest, pounds purchased, and ex-vessel value. The ex-vessel value in COAR includes any post-season adjustments or bonuses paid after the fish was purchased. Production information from COAR is reported by species, area of processing, process type (frozen, canned, smoked, etc.), product type (fillets, surimi, sections, etc.), net weight of the processed product, and the first wholesale value. More information about COAR data can be found at: <http://www.adfg.alaska.gov/index.cfm?adfg=fishlicense.coar>.

ADOR Alaska Salmon Price and Production Reports (ASPR)

The Alaska Salmon Price Report (ASPR) covers first wholesale volume and value - by species and area - for six key Alaska salmon products. First wholesale is defined as the value and volume at the point when product is sold to an entity outside of the processor's affiliate network. The data set includes all processors that sold more than one million pounds of processed salmon products in the previous calendar year, which includes the majority of Alaska's wholesale production of salmon products. The ASPR is a major data source for salmon market analysis. ASPR reports are available on the ADOR website at: <http://www.tax.alaska.gov/programs/programs/reports/index.aspx?60624>

NMFS Export Data

NMFS provides an online database of U.S. seafood exports and imports, based on customs data from the U.S. Census Bureau. Export volume figures apply to the product weight, while export dollar figures represent the value of product as it leaves U.S. ports including the cost of inland freight required to transport product to the port of export. Link: <http://www.st.nmfs.noaa.gov/commercial-fisheries/foreign-trade/index>.

IRI Point-of-Purchase Retail Sales Data

McDowell Group purchased point-of-purchase (POP) data from IRI, Inc. on different types of salmon products sold at U.S. grocery stores. The data set contains four-week sales figures from virtually all U.S. grocery stores extending back to 2010 for fixed-weight product and back to 2011 for random-weight product (those items sold on a per pound basis). Metrics include information about sales volume, sales value, average price, and amount/value of product sold via promotion by product type.

Data from these sources have been structured to provide information applicable to Bristol Bay sockeye to the fullest extent possible. Where the timing of data releases by the agencies causes gaps, McDowell Group has developed estimates based on historical ratios and other relationships.

Limitations of Data and Analysis

Commercial fishing is a heavily regulated business and government agencies collect data on a wide range of variables, from harvest to price to participation. As wild fish move closer to the consumer, publically available data diminishes. For instance, there is no readily accessible public data on the average retail price of canned salmon or the amount of sockeye fillets sold by individual retailers. This data gap has been addressed, to the extent practical, by purchasing point-of-purchase information and interviewing sockeye buyers. McDowell Group also maintains subscriptions to most major trade press outlets and was able to use trade-press data to supplement the public information and provide additional context.

Factors Impacting Ex-Vessel Price in Bristol Bay

Ex-vessel prices for salmon may seem arbitrary given the broad range witnessed in recent years. However, as this section explains, there is a consistent set of factors and a process collectively resulting in the ex-vessel price offered by Bristol Bay processors in any given year. Some of these elements are related to the fishery's attributes and structure, while others are variable factors tied to market conditions or expected supply.

First, a summary of the ex-vessel "price discovery" process is instructive. The steps explained below outline the actions taken by individual processors to determine an ex-vessel price.

1. Wholesale sales during the fall and winter provide cash flow and dictate expected inventory positions heading into the following season.
2. Run strength forecasts are released in the fall and winter, providing information about expected future supply of Bristol Bay sockeye and supply in other competing fisheries.
3. Seafood shows and meetings with customers in the spring allow processors to gauge market demand and work up sales contracts for the upcoming season's production.
4. Production goals for various products are established based on customer demand, strategic planning, and expected harvest volume.
5. Management analyzes the firm's position, with respect to inventory, available capital, production capacity, and sales commitments then runs scenario analyses incorporating expected sales revenue based on expected wholesale prices and other variables. As fishing begins, the analyses are updated to reflect new information.
6. Once management is reasonably confident about market supply, the processor can post an ex-vessel price based on the information and actions explained above. If other processors begin posting prices sooner, a company may decide to simply match those prices and see what develops. Depending on production goals and operating capital, the processor may decide to set their price higher or lower in order to stimulate increased production volume or minimize operating costs and market risk.
7. Management must consider the strategic implications of their price with respect to maintaining access to the resource through their fleet. Paying a low price may temporarily limit risk and/or increase profit for a company, but as a long-term strategy will result in loss of their fleet to more competitive processors. The recent successful entrance of new processors to the Bay, and the expansion of some existing processors' fleets both demonstrate that fishermen can and will switch markets with the right incentives, chief among them being a higher price.

All other things being equal, a commitment to pay higher ex-vessel prices carries greater risk for processors. The final base price offered to fishermen signals many things, including risk tolerance, market expectations, demand from buyers, and financial position. Lower ex-vessel prices generally suggest processors are less

optimistic about wholesale market conditions and more concerned with managing near-term financial risk than increasing production.

While offering a higher price will draw more raw product volume from the fleet, financial gains associated with the additional fish only exist when the gross processing margin is sufficient to cover the increased cost. Otherwise, higher volume simply increases magnitude of the loss. Most Bristol Bay fishermen can readily recall processing startups that sought to secure a fish supply with above-market prices and are no longer in business.

Structural Ex-Vessel Price Factors in Bristol Bay's Salmon Fishery

LACK OF ALTERNATIVES TO STATUS QUO MARKETS

Bristol Bay fishermen looking to bypass primary processors and sell product directly to secondary buyers or consumers face significant capital investments, sizeable risks, and/or lifestyle adjustments. New processing operations in Bristol Bay also face high hurdles. These challenges result from the fishery's remote location and short/intense season.

Consider the inherent differences between the largest and second-largest sockeye fisheries in Alaska; Bristol Bay and Cook Inlet. Allocation battles notwithstanding, these contrasting factors illustrate the higher barriers to entry for processors and direct marketers in Bristol Bay.

Comparison of Bristol Bay and Cook Inlet Salmon Fisheries

Bristol Bay

Sockeye Dependent
Short season, high volume
Limited direct marketing opportunities
Limited custom processing capacity
Higher barriers to entry for processors
Volume sets overall market price
Shipping limited to air freight, full containers

Cook Inlet

Sockeye Dependent
Longer season, less volume
Extensive direct marketing opportunities
Greater custom processing capacity
Lower barriers to entry for processors
Price based on local factors and total supply
Road access to North America, many LCL options

As a result of these factors, Bristol Bay processors have a captive supply, at least in the short-term. Over the long-term, processors must offer competitive prices and services in order to earn a profitable return on investment.

Although barriers to entry are high for processors in the Bay, they are clearly not insurmountable. Existing players must remain competitive or eventually new companies enter the field, which has happened in recent years. All things being equal, more competition amongst buyers (i.e., processors) results in better ex-vessel prices. However, the most recent season also suggests that the presence of more buyers is just one of multiple factors affecting price and is no guarantee of steadily increasing ex-vessel prices.

MARKET-SETTING SUPPLY DELAYS EX-VESSEL PRICING

Bristol Bay's sockeye harvest generally sets the market price for most North American sockeye. Wholesale prices are highly reactive to changes in sockeye supply. Therefore, wholesale prices cannot be estimated until the actual Bristol Bay harvest volume can be reasonably estimated. Processors who post above market ex-vessel

prices prior to the season attract significant interest from fishermen; however, they can be undercut by other processors in the wholesale market leading to lower profitability, which can impact their ability to continue operations. Waiting to post ex-vessel prices allows processors to minimize risks associated with supply-related changes in the wholesale market.

Due to the inherent uncertainty of wholesale prices, fishermen are generally expected to begin fishing without an agreement on ex-vessel price. Naturally, this is a disagreeable proposition for fishermen but seems to be the norm in Bristol Bay. Some companies have made offering advance prices a point of competitive advantage to secure a fleet, but doing so can carry increased risk for the processor, as recently demonstrated by some startup operations no longer doing business in Bristol Bay.

PROCESSING CAPACITY

Supply impacts market prices for Bristol Bay sockeye, but it also affects competitive dynamics within the fishery. A large Bristol Bay forecast creates an expectation that supply will be plentiful. When the expected harvest volume approaches or exceeds available processing capacity the demand for additional sockeye supply among individual processors declines. Processors cannot buy more fish than their processing facilities can handle. Conversely, if a poor harvest is expected processors have more incentive to bid up for supply in order to maximize production capacity and achieve economies of scale in their operations.

Large forecasts often generate discussions about bringing in additional floating processing capacity. Evaluating the short-term benefit of additional processing capacity compared to the stable presence of shoreside canneries requires careful consideration and is well beyond the scope of this report.

PAYING A PREMIUM FOR QUALITY

Fishermen can realize a higher final ex-vessel price by earning bonuses for chilling their fish and implementing other onboard handling practices such as bleeding, fish slides, brailer-bag weight limits and full-immersion chilling.

Quality incentives are a function of consumer demand for higher grade product. However, quality comes at a cost for both fishermen and processors. From the processors' perspective, managing bonus programs and separating supply has an operational cost. Nevertheless, producing higher quality fish raises the overall value of the resource and enhances the bottom line for fishermen and processors.

On the harvesting side, RSW equipment requires a substantial capital investment and slush-icing fish requires some degree of capital investment and ongoing purchase of ice. There is typically some additional crew cost and/or opportunity cost associated with slowing down and handling the fish better.

However, it is important to note that processors have generally not changed their quality-related bonuses when ex-vessel price is low. The practical result is that quality bonuses have a greater percentage effect on gross vessel revenue when ex-vessel price is low.

Variable Factors

Factors that vary from season to season tend to have the greatest effect on ex-vessel and first wholesale prices. The relative impact of each element on ex-vessel price changes each year, depending on market conditions. Common variables (in no particular order of importance) include:

- Expected harvest volume and competing supply
- Inventory, held by primary processors or other segments of the supply chain
- Wholesale prices, which often incorporate the impact of inventories
- Currency exchange rates
- Financial position of individual processors (“weak-link” price scenario)
- Fish size
- Roe yield and quality
- Fuel and labor costs paid by processors
- Random events, such as the Russian embargo

When supply and inventory are ample, there is much less incentive to pay up for raw material (round sockeye). In addition, during periods of declining prices, processors are more conservative in procuring supply. Paying up for fish and selling into a declining wholesale market is quite risky for processors.

In contrast, when supply is tight processors aggressively seek to procure supply to capitalize on rising wholesale prices and fill orders from buyers. The 2013 season - when most fishermen received a base price of \$1.60 - fits the latter market description while the 2015 season resembles the former.

Bristol Bay Salmon Fishery Analysis

The 2015 season will be remembered as one of the most challenging and unique years in the fishery's long history. The preseason forecast predicted the largest Bristol Bay sockeye harvest in 20 years. However, runs came in very late and many processors had begun redeploying tenders and workers to other areas, writing off the Bay as a bust. Soon after, the sockeye arrived in droves. When the last set was hauled the Bay-wide salmon harvest was the second-largest of the past 20 years. The base ex-vessel price for sockeye was \$0.50, less than half the 2014 price of \$1.20.

This section analyzes total ex-vessel value and prices paid to Bristol Bay fishermen, versus first wholesale market value, historical harvest volumes, and other relevant metrics.

Comparative Analysis of Ex-Vessel Price & Value

The \$0.50 base price for Bristol Bay sockeye begs the question of how the market could shift so dramatically in twelve months, particularly when retail prices at local grocery stores did not appear to change much at all. This section examines relationships between historical ex-vessel price/value to the following relevant factors:

- First wholesale prices and value
- Sockeye supply from Bristol Bay and other systems
- Preliminary prices and value of other Alaska sockeye fisheries
- Preliminary versus final prices and value

First Wholesale Price and Value

Key Finding: Bristol Bay processors paid significantly higher ex-vessel prices in 2014, relative to average first wholesale value per pound of product sold, due to lower than expected wholesale prices and sales volumes. Overall gross processing margin declined 44 percent during the 2014 sales cycle and inventories increased. This resulted in a very weak ex-vessel price for 2015 sockeye, as processors acted conservatively to protect capital and minimize risk from declining wholesale prices.

Comparing First Wholesale and Ex-Vessel Value

McDowell Group used custom data requests from the Alaska Salmon Price and Production Report (ASPR) series, published by the Alaska Department of Revenue, and ex-vessel data from the Alaska Department of Fish and Game to analyze the relationship between first wholesale (processor sales) and ex-vessel value (fishermen's sales) specifically for Bristol Bay sockeye. Ex-vessel value and volume were compared to first wholesale sales figures for the period between May of the harvest year and April of the following year, closely approximating one 12-month sales cycle.¹

¹ Although the Bristol Bay fishery typically begins in late June, using these time periods fits better with ASPR's trimester data. Relatively little volume is sold during May and June.

First wholesale sales data in this section include all Bristol Bay sockeye products except for by-products like fish oil or fish meal, which generally account for less than a half percent of the fishery's first wholesale revenue.

Significance of the Analysis

Understanding the link between wholesale and ex-vessel revenue is the most direct way of quantifying the relative “fairness” of prices paid to fishermen. However, it is important to note there is no legally binding framework for setting ex-vessel prices in Bristol Bay, based on wholesale prices or any other metric. Supply and demand dictate the market price for Bristol Bay sockeye. Even though fishermen may begin fishing without knowing the ex-vessel price, in the long run market forces move prices up and down.

Results of the Analysis

There are two ways to evaluate the ex-vessel and first wholesale relationship. The first is to compare the average price of product sold, by both fishermen and processors. The second is to compare the total annual revenue earned by each group as a result of each harvest year. The analysis below employ both methods.

The most common method used to evaluate the pricing relationship is to compare ex-vessel price to first wholesale prices. Table 2 below compares base and final ex-vessel prices to the average first wholesale value per pound of product sold.

In the five years prior to 2014, the base ex-vessel price averaged 26 percent of first wholesale value per pound.² In 2014, the percentage favored fishermen, increasing to nearly 30 percent, reflecting lower-than-expected wholesale prices realized by processors.

In 2015, the base ex-vessel price amounted to only 17 percent of the average first wholesale price of product sold during the first few months of the 2015 sales cycle. This percentage will evolve as 2015 product is sold ahead of next season, but at this point represents a much lower share of wholesale value than any season in recent history. If wholesale prices continue to decline, the share of value represented by ex-vessel price will show a corresponding increase. However, in order to reach levels even close to prior years, such as 22 percent, the average first wholesale price would need to decline by more than \$0.70.

These data strongly suggest Bristol Bay fishermen were underpaid in 2015, but simply comparing price leaves out other important factors — most notably the impact of unsold production (inventory).

See table on following page.

² The ratio of ex-vessel to first wholesale price does not mean fishermen received only 26 percent of total first wholesale dollars while processors retained the remaining 74 percent. Ex-vessel prices are based on round weight while first wholesale prices are based on processed product weight.

Table 2. Ex-Vessel Price vs Average First Wholesale Value per Pound, 2006-2015

Year	Base Ex-Vessel Price/lb.	Final Ex-Vessel Value/lb.	Average First Wholesale Value/lb.	Base Ex-Vessel Price as Pct. of First Wholesale
2006	\$0.55	\$0.66	\$2.25	24%
2007	0.62	0.67	2.45	25%
2008	0.68	0.75	2.95	23%
2009	0.70	0.80	2.97	24%
2010	0.95	1.07	3.37	28%
2011	1.00	1.17	3.99	25%
2012	1.00	1.18	4.01	25%
2013	1.50	1.61	5.31	28%
2014	1.20	1.34	4.06	30%
2015	0.50	-	3.01*	17%*

* Average first wholesale value/lb. only includes product sold between May 2015 and August 2015.
Source: ADF&G and ADOR, compiled by McDowell Group.

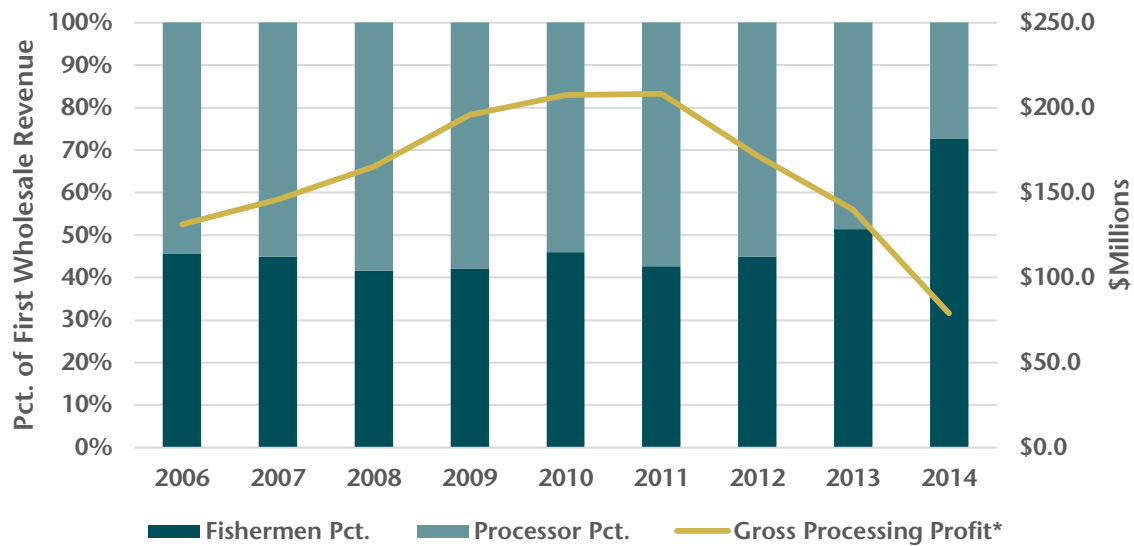
Unit value (price per pound) and total value are two different things and it is important to note that the ex-vessel/first wholesale metric does not account for processing recoveries. Typical processing yields are on the order of 60-70 percent of round weight. While a processor may purchase a million pounds of salmon, it may only yield 600,000–700,000 pounds of salable product, a fact not reflected in the simple ex-vessel/first wholesale price ratio. Smaller fish also tend to yield less wholesale product, and the average fish size declined in 2014 and further in 2015.

Investigating the total value earned by each segment is another way to evaluate the position of each sector. How much of processors' (first wholesale) revenue consists of ex-vessel payments to fishermen? How much "gross processing margin" is left each year to cover all other processor costs (labor, marketing, packaging, capital expenses, etc.) and contribute to profits?

Figure 2 uses publicly available data to compare the harvester and processor share of first wholesale revenue derived from the sale of Bristol Bay sockeye products. Prior to 2013, the relationship was relatively stable as fishermen tended to retain between 42 to 46 percent of the first wholesale revenue earned over the ensuing annual sales cycle. Fishermen fared slightly better than prior years in 2013 and retained a substantially higher share of first wholesale revenue in 2014.

See figure on following page.

Figure 2. First Wholesale Value of Bristol Bay Sockeye, by Sector, 2006-2014



* Gross processing profit represents the first wholesale value of Bristol Bay sockeye products sold during the annual sales cycle following each season, less the ex-vessel cost of fish.
Source: ADF&G and ADOR.

Gross processing profit reflects the value of (first wholesale) revenue less the cost of goods sold. In the case of Bristol Bay, a general industry-wide metric can be measured by subtracting the ex-vessel value of sockeye from the first wholesale sales revenue earned from processed sockeye products. Gross processing profit increased between 2006 and 2011, but has since declined and fell quite significantly in 2014, decreasing 44 percent (see Figure 2). This trend exemplifies the cyclical nature of the industry.

Gross processing profit fell dramatically in 2014 due to 1) lower wholesale prices and 2) an increase in unsold production (inventory). Prior to 2014, processors tended to sell all or nearly all of the season's production during the ensuing 12-months, ahead of the next harvest season. This provided adequate cash flow to fund future operations. However, in 2014 processors only sold an estimated 69 percent of that season's production and entered the 2015 harvest season with nearly one-third of the previous year's (high-cost) production still in inventory.

Inventory will eventually be converted to revenue by processors, recouping some of the 2014 shortfall. However, this product will almost certainly be sold at lower prices than processors originally anticipated when raw material was purchased at a relatively high price in 2014. In the meantime, processing companies bear additional costs associated with storing and marketing the product.

Bristol Bay's 2015 harvest was even larger than the prior year, and while the larger-than-expected 2014 harvest caught everyone in the market off guard, most participants recognized that a large influx of new supply would likely result in lower wholesale prices in coming months. Processors factored these expectations into the 2015 ex-vessel price, in order to avoid selling future inventory at a loss.

These data present somewhat opposing views of whether the \$0.50 base ex-vessel price was justified, but one of the key variables is still unknown. The price at which 2014 canned inventory and other 2015 products are

eventually sold will have a significant impact on processing revenue and the ability to pay better prices in 2016 or issue retroactive bonus payments for the 2015 season.

Sockeye Supply

Key Finding: Bristol Bay sockeye prices are highly correlated with the region's harvest volume. Correlation analysis suggests regional harvest volume in the current and prior year explains 83 percent of the ex-vessel price movement over the past ten years (2006-2015).

Global sockeye production reached a ten-year low in 2013. The following season, global harvests increased 27 percent due to an unexpectedly larger Bristol Bay harvest and Canada's usual spike in production, occurring once every four years.

Bristol Bay harvests increased another 15 percent in 2015, but Russian and Canadian production declined resulting in lower global sockeye production (based on preliminary harvest reports). Bristol Bay accounted for more than half of global sockeye production in 2015, the highest figure since 2009.

The 2014 spike in North American sockeye production entered the market during a period of high prices. This additional supply had a significant impact on the market, and has continued to impact sockeye pricing in 2015.

Table 3. Global Sockeye Harvest by Major Region, Millions of Pounds, 2010-2015

	2010	2011	2012	2013	2014e	2015e
Alaska Total	243	249	214	178	245	280
Bristol Bay	170	135	119	92	161	185
Other AK Areas	73	114	95	86	85	96
Other U.S. States	11	2	1	0	3	0
Russia	80	90	112	122	92	79
Canada	44	7	5	1	42	5
Total	378	347	331	300	382	364
Bristol Bay Pct.	45%	39%	36%	31%	42%	51%
Avg. BB EV Price/lb.	\$1.07	\$1.17	\$1.18	\$1.61	\$1.34	\$0.50

Note: Data for 2014 and 2015 is preliminary or estimated. Bristol Bay prices are presented in nominal terms, including all post-season adjustments and other bonus payments, except 2015 which reflects the preliminary/base price.

Source: ADF&G, DFO, FAO, PACFIN, Russian Federal Fishery Agency, and McDowell Group estimates.

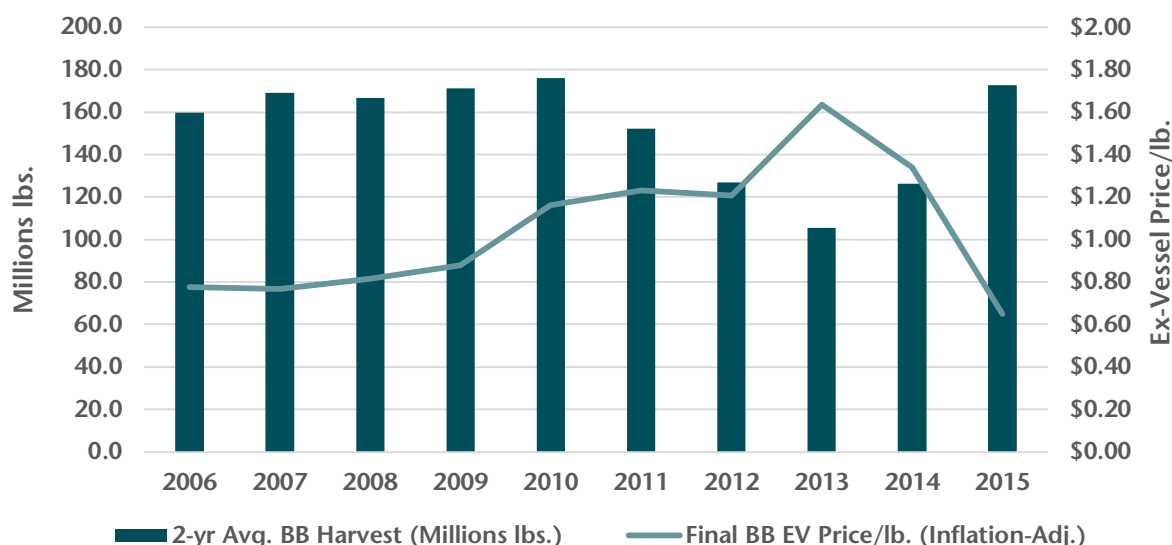
Ex-vessel prices for Bristol Bay sockeye react significantly to changes in the region's harvest volume. Between 2006 and 2015, the correlation between two-year average Bristol Bay sockeye harvest volume and annual ex-vessel price is -0.83, a strong inverse correlation (see Figure 3). As harvests increase, prices almost always declines and vice versa.

Wild fishery harvests can fluctuate widely from year to year and market demand is dictated not just by the current harvest year but by carryover inventory and price-trend momentum from previous seasons as well. Therefore, smoothing harvests with a two-year average provides a better comparison between supply and ex-vessel price.

Interestingly, sockeye supply from other areas was not inversely correlated with Bristol Bay prices, as expected, over the past ten years. This suggests that changes in competing supply did not have a strong impact on Bristol Bay prices. This phenomenon could be explained by supply chain relationships. The same buyers and processors tend to work with each other from year to year. Some volume may be strategically purchased from new suppliers but in general buyers prefer to work with suppliers they know. However, market events like the large 2014 Canadian harvest certainly impact the market for Bristol Bay products. When a surge of fresh Canadian sockeye hit the market following the 2014 Bristol Bay season, demand for frozen H/G Bristol Bay sockeye declined significantly.

Finally, prices are not only impacted by the total harvest volume of Bristol Bay sockeye, but also by the degree to which it changes from year to year. Bristol Bay harvests were relatively consistent from 2006 to 2011 and prices steadily improved after 2009. Declining harvests between 2011 to 2013 pushed prices much higher in a tight market, while the influx of Bristol Bay supply in 2014 and 2015 caused inventories to swell leading to lower prices.

Figure 3. Bristol Bay Sockeye Price vs. 2-yr. Average Harvest Volume, 2006-2015



Note: 2015 data is preliminary. Final prices for 2015 have been estimated based on relationships in prior years to maintain consistency.

Source: ADF&G and McDowell Group estimates.

Value of Other Alaska Sockeye Fisheries

Key Finding: Ex-vessel prices for Bristol Bay sockeye were significantly lower, relative to other Alaska regions, in 2014 and 2015. Much of this difference can be attributed to larger Bristol Bay harvests during the last two seasons. The total ex-vessel value of Bristol Bay sockeye in 2014 and 2015, increased more than any other major sockeye-producing region in Alaska, compared figures from the prior two years.

Bristol Bay sockeye lost unit value in recent years, relative to ex-vessel prices paid for sockeye caught elsewhere in Alaska. In 2014, Bristol Bay sockeye were worth \$0.57 per pound less than the weighted average price of other Alaska sockeye. The difference widened to \$0.62 per pound in 2015 based on preliminary data; however, this trend could change when prices are finalized next spring.

Table 4. Ex-Vessel Price of Bristol Bay Sockeye versus Other Regions, 2011-2015

Region	2011	2012	2013	2014	2015*
Average Ex-Vessel Price/lb.					
Prince William Sound	\$1.86	\$1.82	\$2.45	\$2.42	\$2.01
Cook Inlet	1.42	1.46	2.18	2.11	1.59
Kodiak	1.53	1.47	1.82	1.83	0.89
Alaska Peninsula	1.24	1.26	1.66	1.41	0.60
Other Alaska Sockeye Avg.	\$1.47	\$1.49	\$1.96	\$1.91	\$1.12
Bristol Bay	\$1.17	\$1.18	\$1.61	\$1.34	\$0.50
Difference with Bristol Bay					
Prince William Sound	\$0.69	\$0.64	\$0.84	\$1.08	\$1.51
Cook Inlet	0.25	0.28	0.57	0.77	1.09
Kodiak	0.36	0.29	0.21	0.49	0.39
Alaska Peninsula	0.07	0.08	0.05	0.07	0.10
Other Alaska Sockeye Avg.	\$0.30	\$0.31	\$0.35	\$0.57	\$0.62

* Data from 2015 is based on preliminary prices, while previous data represents the final average price including bonuses and other additional payments to fishermen.

Source: ADF&G.

Even though Bristol Bay sockeye garnered lower prices than other areas in recent years, price alone does not reflect the whole story. In addition to general market factors, regional prices are highly dependent on regional harvest volume. Bristol Bay sockeye harvests increased 75 percent in 2014 and another 16 percent in 2015, compared to a decline of 1 percent and an increase of 13 percent, respectively, for all other Alaska sockeye fisheries combined. Given the difference in regional harvest volume, market destination, and product forms, a larger difference in ex-vessel price compared to other regions is understandable, though still unfortunate.

Table 5 summarizes the total ex-vessel value of Alaska sockeye from key producing areas. The 2014 season represented a relative windfall for Bristol Bay fishermen. Prince William Sound and Kodiak also had a good season in 2014, but the increase in Bristol Bay volume and value was a significant market event driving prices and total value lower for all regions in 2015. The Bristol Bay fishery generally had more room to decline due to the bumper 2014 season.

Table 5. Ex-Vessel Value of Bristol Bay Sockeye versus Other Alaska Regions, 2011-2015

Region	2011	2012	2013	2014	2015*	'14 YoY Pct. Change	'15 YoY Pct. Change	'15 Pct. Change from 4-yr. Avg.
Total Ex-Vessel Value (\$Millions)								
Pr. William Sound	\$39.4	\$45.4	\$34.0	\$47.5	\$34.6	40%	-27%	-17%
Cook Inlet	50.1	32.2	37.4	32.8	24.0	-12%	-27%	-37%
Kodiak	20.5	18.3	26.9	31.1	13.4	16%	-57%	-45%
Alaska Peninsula	20.9	20.5	28.4	26.8	20.0	-6%	-25%	-17%
Other AK Sockeye	\$157.7	\$134.4	\$163.8	\$159.8	\$105.4	-2%	-34%	-32%
Bristol Bay	\$154.7	\$139.7	\$148.7	\$209.6	\$92.4	41%	-56%	-43%

* Data from 2015 is based on preliminary prices and harvest volume, while previous data represents the final ex-vessel value including bonuses and other additional payments to fishermen. Final data for 2015 will not be available until the spring of 2016. The difference in pricing terms makes for an uneven basis for comparison to previous years, but the changes across regions in 2015 is still a valid set of information.

Source: ADF&G.

Comparing ex-vessel prices of Bristol Bay sockeye to those received by Canadian or Russian fishermen is not possible for two reasons. First, Fraser River sockeye production in Canada varies greatly from year to year and occurs after the Bristol Bay fishery. Canadian ex-vessel prices are highly impacted by regional harvest volume and by Bristol Bay production volume, obscuring the actual premium for Canadian sockeye which tend to be sold into North America markets as fresh product. Second, Russian sockeye are primarily harvested using fish traps at sites owned or leased by processing companies. Here the fishermen are employees of the processor and there is no ex-vessel transaction.

Preliminary vs. Final Ex-Vessel Value and Price

Key Finding: The relative value of chilling fish was greater in 2015, as most processors reportedly held quality bonuses constant despite offering a much lower base price. Data from past seasons suggests the final ex-vessel price for Bristol Bay sockeye will be \$0.12 to \$0.18 higher than the \$0.50 base price.

ADF&G issues two data sets quantifying the value and average price of Alaska salmon: a preliminary and final set. Preliminary data comes out each fall following the summer salmon fisheries. This data reflects the average base price and harvest volume based on fish tickets. In fisheries where it is common practice to omit prices on fish tickets, area biologists survey processors and use any area fish tickets with a listed price to estimate the average base price. This preliminary or base price does not include quality bonuses or any other post-season payments. The final determination of ex-vessel value is issued in the spring following the salmon harvest year. ADF&G collects information about the total value of salmon processors payments to fishermen. This final value includes bonuses and other payments in addition to the base price. Harvest volume is also adjusted, but changes tend to be relatively minor on a percentage basis.

Supplementary payments — in addition to the base price/value — tend to account for 6 to 18 percent of the final ex-vessel value. The relative value of bonuses and adjustments is often significantly higher when base prices are low. A \$0.15 bump on a base price of \$0.50 per pound is generally more attractive than the same bump to a base price of \$1.50 per pound. This suggests that even during periods of weak overall demand and plentiful supply, processors are willing to pay a relatively constant premium for high quality fish.

Table 6. Preliminary vs. Final Bristol Bay Sockeye Ex-Vessel Value and Price, 2006-2015

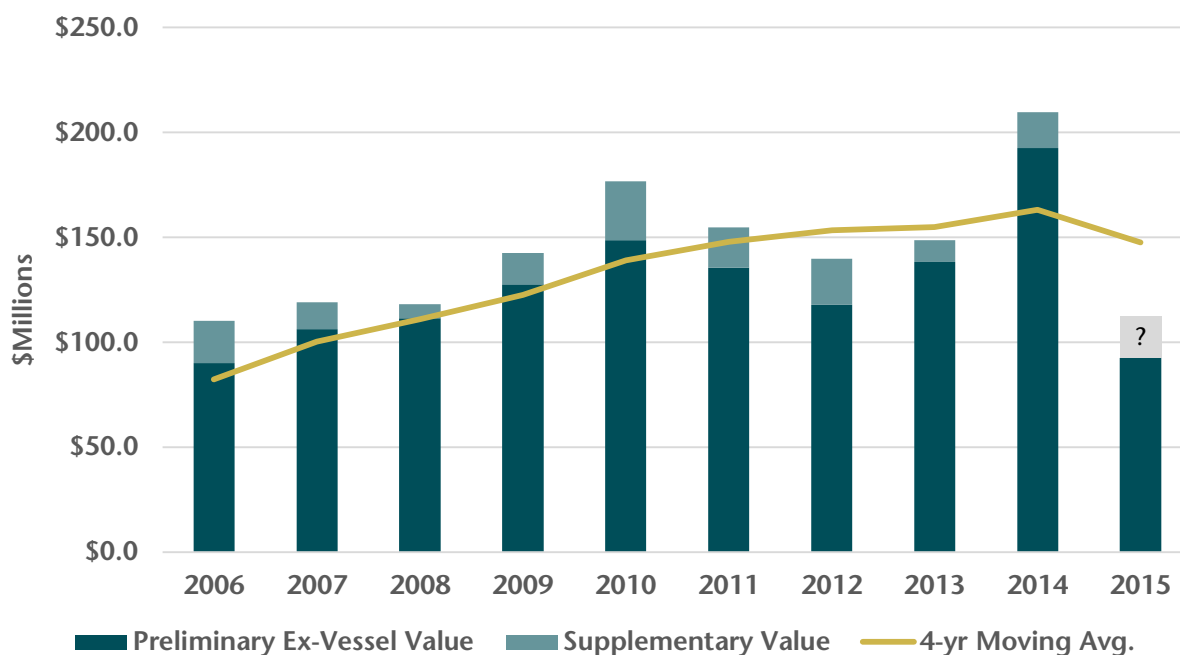
Year	Preliminary Price	Final Price	Difference in Price	Preliminary Value (\$M)	Final Value (\$M)	Difference in Value (\$M)	Value - Pct. Difference
2006	\$0.55	\$0.66	\$0.11	\$90.2	\$110.4	\$20.1	18%
2007	0.62	0.67	0.05	106.1	119.2	13.1	11%
2008	0.68	0.75	0.07	111.4	118.0	6.7	6%
2009	0.70	0.80	0.10	127.6	142.5	14.8	10%
2010	0.95	1.07	0.12	148.7	176.8	28.1	16%
2011	1.00	1.17	0.17	135.7	154.7	19.1	12%
2012	1.00	1.18	0.18	117.8	139.7	21.8	16%
2012	1.50	1.61	0.11	138.4	148.7	10.3	7%
2014	1.20	1.34	0.14	192.7	209.6	16.9	8%
2015*	0.50	N/A	-	92.4	-	-	-

Source: 2006-2015 preliminary data: ADF&G Season Summaries, data based off fish tickets and information collected by area biologists, and 2006-2014 final data: ADF&G COAR Buying data (prices retrieved from ADF&G website on 10/27/2015) and value based on custom COAR request.

The final 2015 price and total ex-vessel value is difficult to forecast. An increase of approximately \$0.15 per pound could be expected based on the difference in recent years, but 2015 was a very unique season. Supplemental payments made in previous years may not be an accurate indicator given the dramatic changes in base price and other factors.

Price is a key variable, but total revenue (i.e., ex-vessel value) must also be considered. The fishery's ex-vessel value has been much less variable than ex-vessel price over the past decade. Despite several years of relatively stable ex-vessel values, the fishery endured historic volatility in the last two seasons. Regardless, the ex-vessel value produced in 2014 and 2015 averaged \$151 million (not including 2015 supplemental value), only slightly below the previous four-year average of \$155 million per season. Once final 2015 values are factored in, the last two seasons will almost certainly represent an increase in average (nominal) ex-vessel value. However, changes in ex-vessel value over time does not necessarily mean fishermen are earning a fair or unfair price.

Figure 4. Ex-Vessel Value of Bristol Bay Sockeye, 2006-2015



Note: The 4-yr moving average in 2015 does not include any supplementary value.
Source: ADF&G.

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Bristol Bay Sockeye Supply Chain Primer

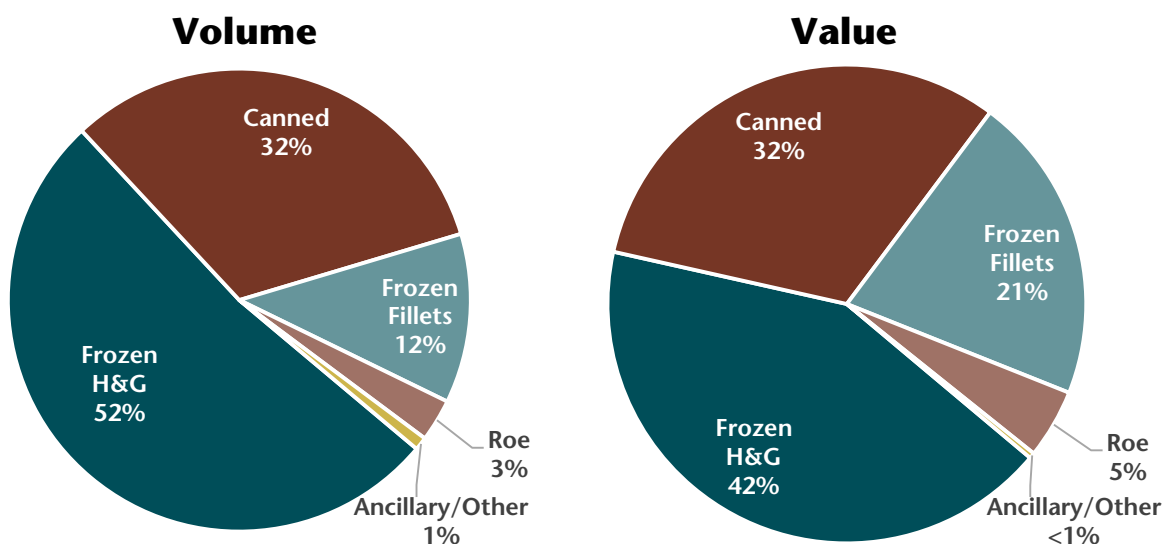
Understanding how changes in wholesale or retail markets impact the ex-vessel value of Bristol Bay sockeye requires basic knowledge of the entire supply chain. Ex-vessel value is primarily a function of demand for products derived from the fishery. This section provides reference information about the mix of products produced from Bristol Bay sockeye, key markets, and an illustration of value added throughout the supply chain.

Product Composition

Bristol Bay sockeye is primarily processed into frozen meat and canned products, which accounted for 94 percent of the fishery's total wholesale value in 2014. These products drive overall resource value. Roe, fresh H&G, fresh fillets, and ancillary products made up the remaining 6 percent. Each of these products is sold into different markets, which makes the fishery more diversified and less dependent on a single market or product type.

Bristol Bay's product mix can change depending on factors such as product form demand, harvest volume, run timing/intensity, fish quality, fish size, and roe recovery. However, frozen H&G and canned production have been the dominant product forms. Fillet production is limited by production capacity, while roe is usually a function of total harvest volume. In general, production decisions are largely between canning or freezing fish in a headed/gutted format. Maximizing available processing capacity results in significant amounts of both products being produced each year.

Figure 5. Composition of First Wholesale Volume and Value of Bristol Bay Sockeye, 2014



Note: Frozen H&G and frozen fillets data shown above includes a relatively small amount of fresh production. Fresh products were not broken out into a separate category because they account for only about 1 percent of total volume and value.

Source: ADF&G (COAR).

Markets for Bristol Bay Sockeye

The U.S. has been the largest market for Bristol Bay sockeye in recent years, followed by the UK, Japan, Canada, and other European countries. Frozen H&G sockeye is primarily sold to Japanese retailers, North American secondary processors, and salmon smokers in central Europe. The UK is still likely the largest canned sockeye market, followed closely by Canada, which appears to be gaining market share. Canned sockeye can also be found on most grocery shelves in Australia and the U.S., but has lower sales than the top two markets. The U.S. grocery market is a key market for Bristol Bay sockeye and absorbs the majority of Bristol Bay's fillet production, with relatively smaller amounts of fillets exported to smokers in Germany and France. Japan is the primary market for sockeye roe.

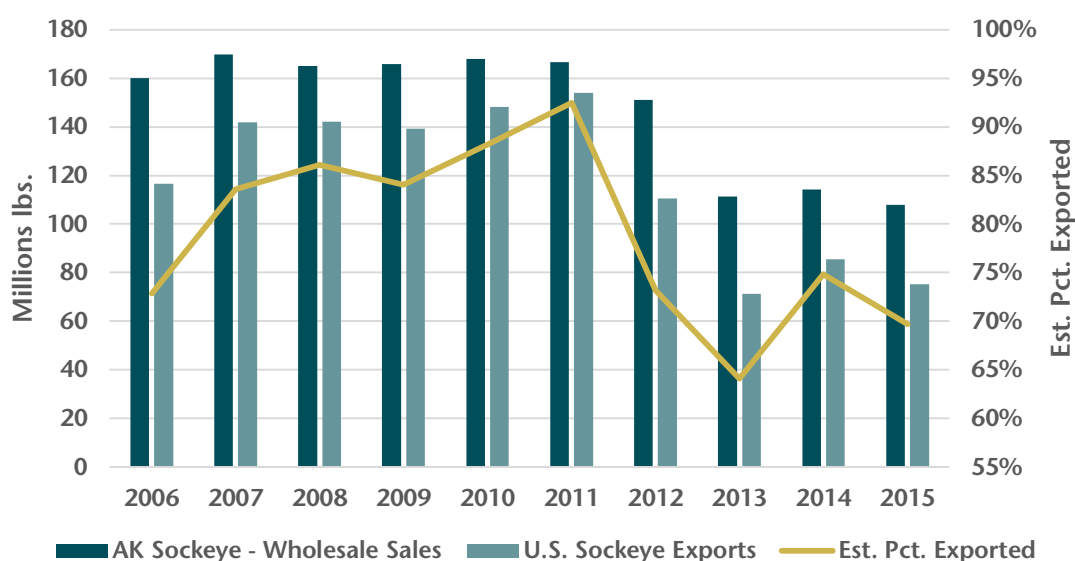
Table 7. Major Bristol Bay Markets by Product Form

Product Form	Major Markets	Pct. of Wholesale Value - 2014
Frozen H&G	Japan, Europe, and North America	42%
Canned Salmon	UK, Canada, U.S., and Australia	32%
Frozen Fillets	U.S.	21%
Roe	Japan	3%

Source: NMFS trade data, Global Trade Atlas and industry interviews.

Export markets account for 65 to 90 percent of Alaska sockeye sales, by volume. However, the U.S. market has been a more active buyer in recent years. Much of the historical decline in exports is due to less frozen product being exported to Japan.

Figure 6. Estimated Export Market Share versus First Wholesale Volume of Alaska Sockeye, 2010-2015



Note: U.S. sockeye exports may include sockeye from outside Alaska, but other states produce a relatively small volume of sockeye — most of which is likely sold into domestic fresh markets.
Source: ADOR (ASPR) and NMFS Trade Data.

Supply Chain

Bristol Bay fishermen are the first link in a supply chain that stretches thousands of miles. Each link serves functions that add value to finished products. The sockeye supply chain generally includes five major steps, shown below.



Most Bristol Bay sockeye production moves through each segment listed above, but there are exceptions. Sometimes fishermen act as processors and sell directly to consumers. Also, it is common for primary processors to sell products under their own brand directly to retailers. When products are exported or sold into specialty shops, two or three distributors may be involved. Regardless of how a sockeye product gets to the consumer, the functions of each segment must be fulfilled: fish must be caught, processed, shipped/disaggregated, and sold to consumers. Whether a product gets to the consumer via the traditional supply chain model or skips a link (or two); value (and cost) are still added to the final product.

McDowell Group leveraged newly acquired retail sales data, public data on ex-vessel and first wholesale sales, and industry interviews from previous studies to estimate the value added by each supply chain segment stemming from the sale of Alaska sockeye products (see Table 8).³

Table 8. Estimated Share of Retail Value for Alaska Sockeye Products, by Segment, 2010-2014 Average

Supply Chain Segment	Est. Value-Added per Round Pound	Est. Share of Retail Value
Harvesters	\$1.39	28%
Primary Processors	\$1.49	30%
Distributors/etc.	\$0.57	11%
Retailers	\$1.57	31%

Notes: This data uses available information to estimate the share value retained by major supply chain segments for sales of primary Alaska sockeye products (including H&G, canned, fillets, and roe, but not ancillary products such as fish oil/meal). The figures do not include additional value added by the food service sector.

Source: McDowell Group estimates, based on harvest and sales data from ADF&G (COAR), ADOR (ASPR), IRI, Inc (POP sales data), and industry interviews.

After converting the value of production to a round-pound basis, harvesters, processors, and retailers tend to earn similar shares of the final, retail-equivalent production value. The share of value retained by each segment changes somewhat from year to year. Changing market conditions favor different supply chain segments from year to year.

Estimating each segment's relative value requires a consistent basis for product volume. Prices for key products were converted to a round-weight basis, in order to account for lost weight as sockeye moves from raw to

³ It should be noted that producing these estimates requires a blend of several data sources and the use of assumptions to account for gaps in the data. Where assumptions were required, efforts were made to base assumptions on relationships between data sources or by using input received from supply chain participants.

finished product. As a result, the estimated retail value per round pound is significantly lower than prices shown in stores — which are based on product weight. Retail value estimates also incorporate the impact of promotional pricing, sales timing relative to harvest timing, product composition, and shrink (product lost to spoilage or other reasons).

Sockeye Salmon Market Summary

This section summarizes wholesale market conditions for key Bristol Bay sockeye products and analyzes trends affecting pricing. For reference information about product composition and key markets for Bristol Bay sockeye, see the *Supply Chain Primer* section on page 23.

Wholesale Market Summary for Key Products

Wholesale prices for all key sockeye products are down significantly from early 2014. Larger sockeye harvests, stronger U.S. dollar, and the Russian import ban on U.S. and Norwegian seafood products are the primary factors affecting wholesale prices. Aided by lower prices and increased production, sales volume is up over the past 16 months. However, production has increased faster than sales volume, suggesting increased inventories — particularly of canned sockeye.

Frozen H&G sockeye prices appear to have stabilized in recent months, generally settling within the price range of products sold during July and August. Further, sales of frozen Bristol Bay H&G sockeye increased 47 percent in 2015 during the big July/August sales months, compared to the same months in 2014. Processors still have some frozen product to sell, but sales velocity following the 2015 season was much better than the prior year, which is a positive sign for fisherman and processors.

Canned sockeye inventories are still a primary concern for Bristol Bay processors. Canned prices have fallen in recent months and will likely continue declining until demand increases enough to begin taking inventory out of the system. However, the USDA announcement to buy up to \$30 million of canned sockeye product will help move some inventory. In addition, export data show a large increase in September 2015 canned sockeye exports, which was sold at a higher average price than prior months.⁴

Analysis of Frozen H&G Bristol Bay Sockeye

KEY MARKETS: JAPAN, EUROPE, AND NORTH AMERICA

PCT. OF BRISTOL BAY SOCKEYE FIRST WHOLESAL VALUE (2014): 42 PERCENT

Factors influencing sales volume and pricing for frozen H&G Bristol Bay sockeye:

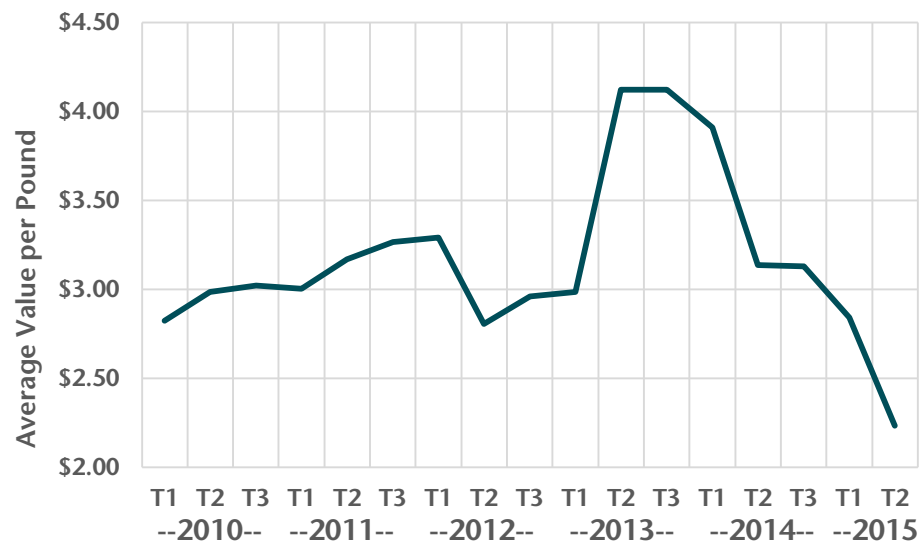
- Market is well supplied after two years of larger harvests.
- Recent currency exchange rate movements have made Alaska product significantly more expensive from the perspective of foreign buyers. Meanwhile competing supply from Russia, Norway, and Chile has become relatively less expensive due to weaker currencies in those countries.
- Declining prices and increasing competing supply of farmed salmon, partly as a result of the Russian embargo.

⁴ September 2015 is not yet available in the ASPR price/volume data analyzed in this section.

- The percentage of smaller fish increased significantly in 2014 and again in 2015. Smaller fish receive significantly lower prices; however, trade press reports brisk sales activity of smaller fish in Japan due to lower prices.
- Some processors cannot sell 2015 production to buyers in Europe, which require MSC certification. Existing MSC certificate holders agreed to transfer their certificate to another group of large processors in July 2015, but it can only be used to sell product produced after 2015.

As a result of the market issues listed above, unit values of frozen H&G Alaska sockeye are down considerably (see Figure 7). The decline has been magnified to some extent by an increase of smaller, less expensive fish. However, the average unit value is a better indicator of the total value realized by processors for each pound of frozen H&G product sold. Similar pricing data capable of supporting an accurate time series of frozen H&G sockeye prices, separated by size, is not publicly available.

Figure 7. Average First Wholesale Value per Pound, Frozen H&G Alaska Sockeye, by Trimester, 2010-2015



Source: ADOR (ASPR).

First wholesale sales volumes are up significantly in recent months (see Table 9). Sales were somewhat delayed in 2014, as a result of the large Fraser river harvest in Canada. In comparison, frozen H&G production sold faster during the second trimester in 2015. Frozen H&G export volumes and U.S. retail sales of sockeye fillets are increasing as well. If these trends continue, the increase in sales volume should result in lower inventories heading into 2016.

Table 9. First Wholesale Sales Volume of Frozen H&G Alaska Sockeye, by Trimester, Millions of Pounds, 2010-2015

	2010	2011	2012	2013	2014	2015	Pct. Change YoY
Trimester 1 (Jan.-Apr.)	8.4	7.8	6.6	3.0	3.4	10.5	+207%
Trimester 2 (May-Aug.)	50.3	36.5	26.1	18.3	13.8	38.9	+182%
Trimester 3 (Sep.-Dec.)	24.6	33.2	29.3	17.5	29.6	N/A	N/A

Source: ADOR (ASPR).

Analysis of Canned Alaska Sockeye

KEY MARKETS: UK, CANADA, U.S., AND AUSTRALIA

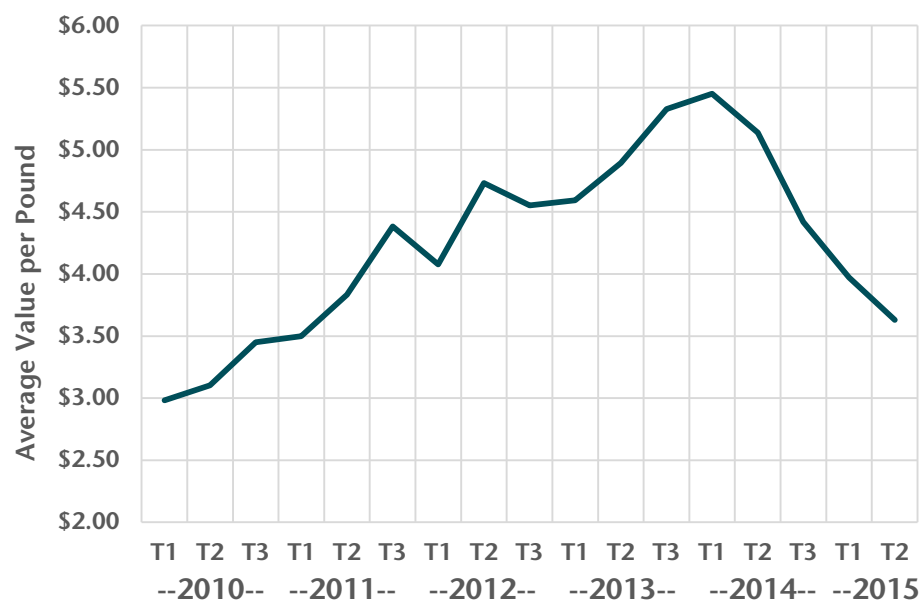
PCT. OF BRISTOL BAY SOCKEYE FIRST WHOLESALE VALUE (2014): 32 PERCENT

Factors influencing sales volume and pricing for canned Alaska sockeye:

- Market is well supplied after two years of larger harvests, resulting in rising inventories
- Price difference between canned sockeye and pink salmon remains significant, particularly at retail
- USDA agreement to buy canned Alaska sockeye provides incremental relief for processors.

As a result of the market issues listed above, unit values of canned Alaska sockeye are down 33 percent from the peak in early 2014 (see Figure 8). Bristol Bay typically produces at least two-thirds of the state's total canned red salmon pack, and in some years accounts for more than three quarters of total production. As a result, the region has more exposure to the canned red salmon market than other sockeye fisheries.

Figure 8. Average First Wholesale Value per Pound, Canned Alaska Sockeye – Half Cans, by Trimester, 2010-2015

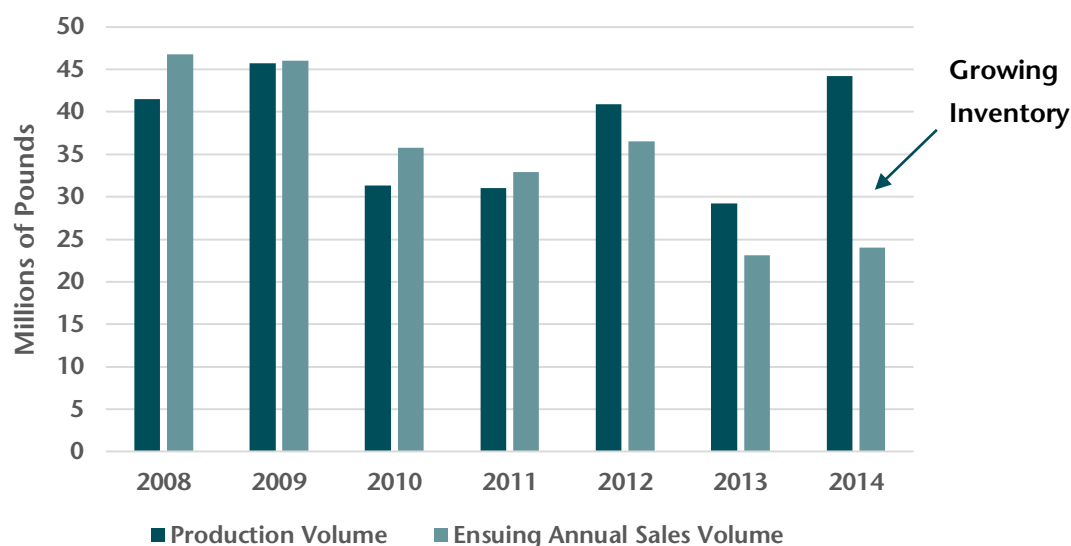


Source: ADOR (ASPR).

Figure 9 on the next page compares canned sockeye production with first wholesale sales volume over the ensuing 12-month period. Sales volumes increased less than four percent in the most recent annual sales cycle, while production grew 51 percent.

However, there are some recent signs of life for the venerable product form. First wholesale sales volume increased 53 percent during the first eight months of 2015, compared to the same period the prior year (see Table 10 on the next page). Recent sales trends are encouraging, but there is a substantial amount of inventoried product that needs to be sold and recent sales volume is still below past years which produced significant canned sockeye volumes.

Figure 9. Canned Alaska Sockeye Production and First Wholesale Sales Volume, Millions of Pounds, 2008-2014



Source: ADOR (ASPR).

Table 10. First Wholesale Sales Volume of Canned Sockeye, by Trimester, Millions of Pounds, 2010-2015

	2010	2011	2012	2013	2014	2015	Pct. Change YoY
Trimester 1 (Jan.-Apr.)	16.0	10.3	8.1	8.6	6.1	10.6	+74%
Trimester 2 (May-Aug.)	9.3	6.1	4.3	4.0	5.4	7.0	+29%
Trimester 3 (Sep.-Dec.)	16.2	18.8	23.6	13.0	7.9	N/A	N/A

Source: ADOR (ASPR).

Analysis of Frozen Alaska Sockeye Fillets

KEY MARKETS: U.S.

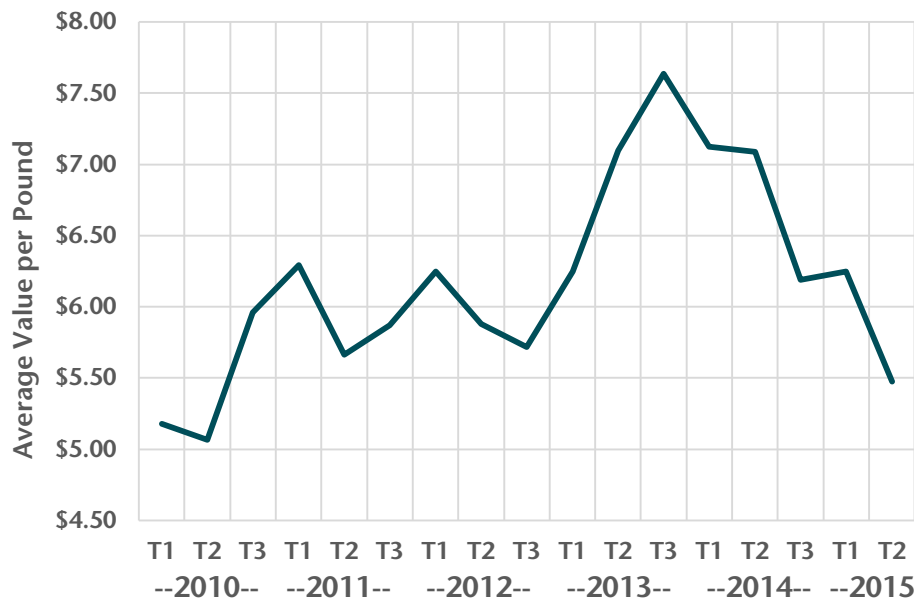
PCT. OF BRISTOL BAY SOCKEYE FIRST WHOLESALE VALUE (2014): 21 PERCENT

Factors influencing sales volume and pricing for frozen Alaska sockeye fillets:

- Fillet market follows trends in the frozen H&G market, which is often used to produce chilled fillets
- Market is well supplied after two years of larger harvests
- Competition from other farmed and wild salmon products, which are also selling at lower prices.

As a result of the market issues listed above, unit values of frozen Alaska sockeye fillets are down 28 percent from the peak in late 2013 (see Figure 10). Average fillet prices have not declined as much as frozen H&G sockeye unit values (average H&G prices across all sizes). This is most likely due to the fish size issue, which has less of an impact on fillet pricing. The sales data shown below mostly applies to once-frozen fillets. These fillets are often sold at grocery stores in the U.S. as both frozen and thawed/chilled products.

Figure 10. Average First Wholesale Value per Pound, Frozen Alaska Sockeye Fillets, by Trimester, 2010-2015



Source: ADOR (ASPR).

Bristol Bay frozen fillet production is split approximately 60/40, between frozen/IQF or other formats and vacuum packed products. The latter almost always sells for a higher price, but costs more to produce both in terms of dollars and time.

Analysis of Frozen Alaska Sockeye Roe

KEY MARKET: JAPAN

PCT. OF BRISTOL BAY SOCKEYE FIRST WHOLESALE VALUE (2014): 5 PERCENT

Factors influencing sales volume and pricing for frozen Alaska sockeye roe:

- Increased supply due to large harvests of Alaska pink and sockeye salmon
- Russian embargo and Ukrainian economic turmoil has effectively closed key alternative salmon roe markets
- Weaker Japanese yen, relative to the U.S. dollar.

Table 11 contains first wholesale information about Alaska sockeye roe sales corresponding with harvest years (not necessarily calendar year sales). Most of Alaska's salmon roe is exported to foreign markets, primarily Japan, either during or soon after the harvest season. Roe tends to account for 5 to 6 percent of total first wholesale revenue; however, due to lower prices the category is expected to make a smaller contribution to total revenue during the 2015 sales cycle.

Alaska sockeye roe prices are affected by many factors, but the yen/USD exchange rate and production volume have the most influence on first wholesale prices. Roe prices tend to be higher when the Japanese yen is strong and lower if the yen is weak, as the product is more expensive from the buyer's perspective in the latter

situation. Despite the impact of exchange rates, Alaska sockeye roe sales tend to produce a consistent amount of sales revenue each year, often between \$30 and \$35 million.

Table 11. Alaska Sockeye Roe Sales Value and Unit Value, 2008-2015

Harvest Year	Sales Volume (Millions lbs.)	Sales Value (\$Millions)	Pct. of Total Sales Value	Average First Wholesale Value/lb.	August Yen/USD Exchange Rate
2008	4.4	\$29.8	6.5%	\$6.72	109.4
2009	5.9	29.9	5.5%	5.06	95.0
2010	5.8	29.7	5.0%	5.11	85.6
2011	5.8	34.4	5.1%	5.89	77.1 (strong yen)
2012	4.8	34.7	5.6%	7.19	78.7
2013	4.6	35.0	6.1%	7.53	97.9
2014	5.4	33.0	5.8%	6.07	102.9
2015*	3.1	11.2	4.1%	3.59	123.3 (weak yen)

* Sales data only includes product sold between May 2015 and August 2015.

Source: ADOR (ASPR) and OANDA, compiled by McDowell Group.

Roe data shown above include all product types, primary green roe (frozen, unsalted salmon roe skeins) and sujiko (frozen, salted salmon roe skeins). The production mix in Bristol Bay tends to be fairly consistent from year to year, with equal production volume between the two main product types. Harvest volume, run timing, and demand for each product type affect production volume of each product. Sujiko takes longer for processors to produce, since it must be salted according to exact specifications. However, the product is more valuable than green roe, selling for a premium of 50 to 60 percent per pound in most years.

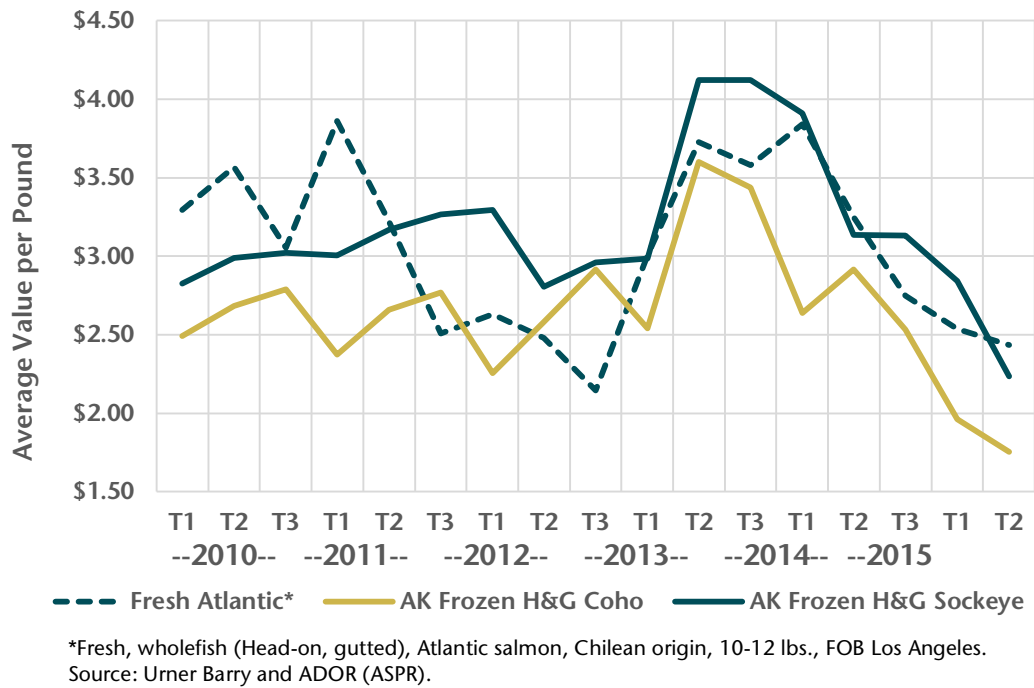
Market Summary for Farmed Salmon and Wild Coho Salmon

Prices for competing salmon products have followed the same steep downward trend as sockeye since early 2014 (see Figure 11). The U.S. wholesale price of fresh, dressed Atlantic salmon from Chile is down 37 percent since the first trimester in 2014 while prices for frozen Alaska coho are down 34 percent. Frozen sockeye prices are down 43 percent over the same timeframe. From the general consumer perspective, these are all similar salmon products. Lower sockeye prices significantly affect coho prices but also impact farmed salmon to a lesser extent.

Lower prices for farmed Atlantic salmon have primarily been the result of a stronger U.S. dollar and the Russian import ban on Norwegian salmon. The stronger dollar has made it easier for foreign exporters to accept lower prices due to more favorable exchange rates, and Russia's actions have pushed market-moving volumes of Norwegian salmon into European and U.S. markets.

Large downward shifts in sockeye and coho wholesale prices negatively impacted many Alaska fishermen in 2015. Bristol Bay sockeye experienced one of the biggest declines in ex-vessel price. However, the silver lining for Bristol Bay fishermen is that many were able to partly offset the sting of lower prices by catching more fish. Outside of Prince William Sound seiners, this was not the case for fishermen in many regions.

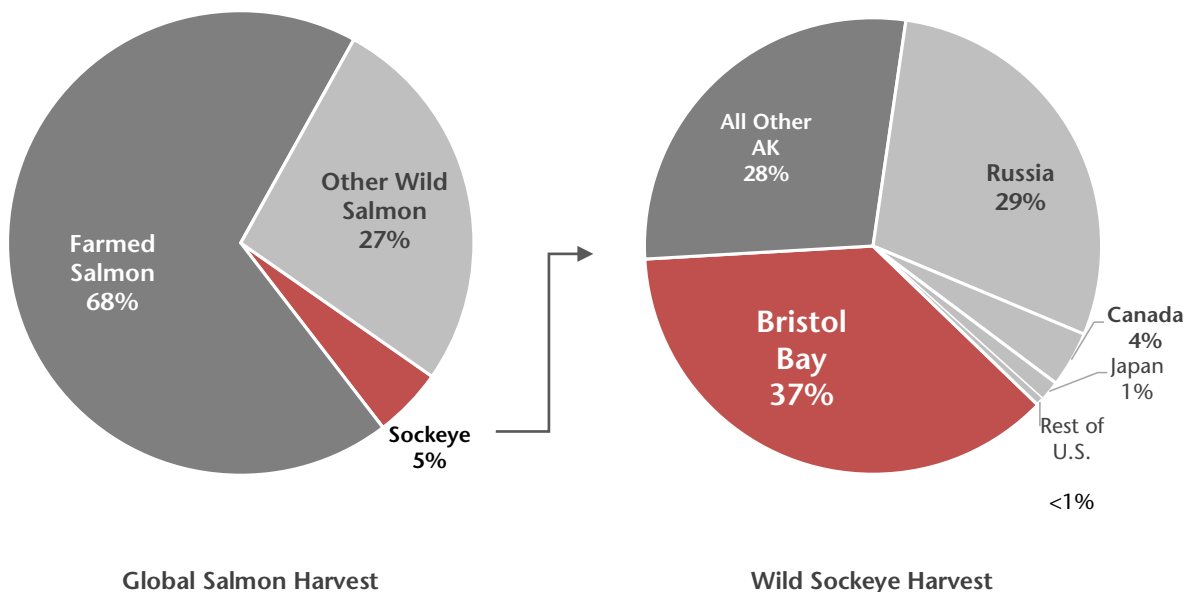
Figure 11. Average Wholesale Price per Pound of Selected Salmon Products, by Trimester, 2010-2015



Sockeye Supply Summary

On a global scale, sockeye are relatively rare creatures. Like other wild salmon species, sockeye harvests fluctuate but generally comprise 4 to 7 percent of global salmon production and 13 to 20 percent of wild salmon harvests. Between 2011 and 2014, sockeye accounted for 5 percent of the world's salmon harvest by volume and 15 percent of the world's wild salmon harvest.

Figure 12. Global Salmon Harvest and Sockeye Harvest by Region, 2011-2014



Note: Some 2014 harvest data comes from preliminary sources.
 Source: ADF&G, FAO, DFO, Trade Press, and McDowell Group estimates.

Global sockeye harvests fell to 300 million pounds in 2013, the lowest figure since 2003 (see Table 12). Harvests increased 38 percent in 2014, exceeding 400 million pounds for the first time since the mid-1990s. The sudden shift in supply, in addition to other factors, dramatically affected market conditions and has led to lower prices. Preliminary harvest estimates suggest total supply declined approximately 5 percent in 2015; however, Bristol Bay production increased 15 percent. Since 1990, Bristol Bay has produced 44 percent of the world's annual sockeye harvest volume. This percentage increased to an estimated 51 percent in 2015, the highest share of supply since 2009.

Table 12. Global Sockeye Harvest by Major Region, Millions of Pounds, 2010-2015

	2010	2011	2012	2013	2014P	2015E
Alaska Total	243	249	214	178	245	280
Bristol Bay	170	135	119	92	161	185
Other AK Areas	73	114	95	86	85	96
Other U.S. States	11	2	1	0	3	0
Russia	80	90	112	122	92	79
Canada	44	7	5	1	42	5
Total	378	347	331	300	382	364
Bristol Bay Pct.	45%	39%	36%	31%	42%	51%

Note: Data for 2014 and 2015 is preliminary or estimated.

Source: ADF&G, DFO, FAO, PACFIN, Russian Federal Fishery Agency, and McDowell Group estimates.

Implications of Currency Exchange Rates

Prices for Alaska sockeye products have been negatively impacted by a stronger U.S. dollar in recent years. A stronger dollar, relative to the currencies of key export markets and competing suppliers, generally makes Alaska seafood products more expensive and competing product less expensive from foreign consumers' point of view. The strength of the U.S. dollar directly impacts the resource value for Alaska sockeye because export markets tend to buy 60 to 90 percent of Alaska sockeye production volume. Japan, Europe, and Canada are key trading partners, while Russia, Norway, Chile, and Canada (occasionally) are the biggest competitors.

Table 13 summarizes changes in foreign currency rates for key buyers and major competitors, versus the U.S. dollar, between 2013 and 2015. Exchange rates vary from year to year, but movements of this magnitude are unusual. Unfortunately, the situation has swiftly altered the bargaining position of Alaska salmon producers.

Table 13. Changes in Relevant Currency Exchange Rates, October 2013 vs. October 2015

Country/Market	Currency	Primary Role	Pct. Change vs. U.S. Dollar
European Union	Euro	Buyer	-17.6%
Japan	Yen	Buyer	-18.6%
Canada	Canadian Dollar	Buyer & Competitor	-20.8%
Russia	Ruble	Competitor	-49.2%
Norway	Kroner	Competitor	-28.1%
U.S. Dollar Index (value relative to a basket of foreign currencies)			+20.9%

Source: OANDA Average Foreign Exchange Rates and Investing.com DXY historical data.

U.S. Retail Sockeye Market Analysis

McDowell Group purchased point-of-purchase (POP) data from IRI, Inc. on different types of salmon products sold at U.S. grocery stores. The data set contains four-week sales figures from virtually all U.S. grocery stores extending back to 2010 for fixed-weight product and back to 2011 for random-weight product (those items sold on a per pound basis). Metrics include information about sales volume, sales value, average price, and amount/value of product sold via promotion by product type.

The U.S. retail market is the largest sockeye market. This POP data provides insights about sales velocity, average price, and promotional activity for key sockeye products in recent years. These trends in the retail sector will have a significant impact on future market conditions, as Bristol Bay sockeye production increased sharply in recent years, resulting in lower prices for fishermen and processors. So long as larger production volumes exist, ex-vessel and first wholesale prices will likely remain low until consumer-level sales volumes adjust to absorb the increase, either in domestic or export markets.

In addition, POP data can measure how responsive retail pricing is to changes in the wholesale market. This is a question asked by many fishermen, who saw ex-vessel prices tumble nearly 60 percent while retail prices for sockeye fillets appeared to change very little.

U.S. Retail Market Trends

Above all, Alaska sockeye producers need the retail sector to increase sales volume in order to absorb increased production from recent seasons. Typically, retailers react to increased commodity supply and lower wholesale prices by increasing promotion at lower prices in order to drive up sales volume.

POP data suggests sales volume in the U.S. grocery segment has increased substantially since 2014. U.S. retailers are just one key market segment for Alaska sockeye products; however, it is one of the most important market segments. U.S. retail sales trends are encouraging and show the market is moving larger volumes (generally at lower retail prices). Sales volume in the largest category, fillets/sides/steaks sold by random weight in grocery store seafood cases, have increased the most of any product category.

Table 14. Change in Sales Volume of Sockeye Products in U.S. Grocery Stores, 2012-2015

	Pct. of Volume	----- Change in Sales Volume -----			
		2012	2013	2014	2015*
Random Weight (Mostly Fillets)	80%	+3%	-18%	+22%	+25%
Canned Sockeye	12	-17%	-9%	-10%	9%
Fixed Weight Frozen/Chilled	7	-14%	2%	-2%	16%
Smoked and Other Thermally Processed	<1%	-1%	14%	0%	11%
Total	-	-2%	-15%	15%	22%

*Through most recently available data, compared to similar period from prior year.

Source: McDowell Group estimates based on IRI POP U.S. Grocery Sector data.

POP data covering all U.S. grocery stores show retailers have significantly increased promotions of key sockeye products. Through the first eight or nine months of 2014, slightly more than 40 percent of random-weight sockeye products were sold “on promotion.” This figure increased to 54 percent in 2015. Canned sockeye promotions were relatively rare in 2014, as retailers resisted lowering retail prices on product which was purchased at a higher wholesale prices. However, the volume of canned sockeye sold on promotion has roughly tripled thus far in 2015 (see Table 15).

Table 15. Sales Volume Sold via Promotion in U.S. Grocery Stores, 2014-2015

Product Type	Pct. of Volume 2014	Pct. of Sales Volume via Promotional Price YTD 2014	YTD 2015
Random-Weight (Mostly Fillets)	80%	41%	54%
Canned Sockeye	12%	8%	25%

Source: McDowell Group estimates based on IRI POP U.S. Grocery Sector data.

Recent POP sales data on random weight sockeye fillets sold this past summer is also encouraging. From mid-May through early August sales volume increased 23 percent and the volume sold on promotion increased 42 percent. However, better sales performance was not confined to sockeye, as other random-weight salmon products posted similar performance during the same period.

POP data on sockeye fillets from the most recent period bears special mention. During the four weeks ending 8/9/15, the average retail price of random-weight sockeye fillets declined from \$10.97 to \$9.57 per pound (from the prior four-week period). This appears to have had a significant impact on sales volume, which registered the highest four-week sales volume total of any period since at least 2010 and was 53 percent greater than the same period in 2014. The data point confirms comments received from retailers during interviews for previous sockeye reports, that U.S. retailers can sell significant volumes of sockeye when retail prices are below \$10 per pound. Current wholesale prices allow retailers to offer sockeye fillets on special at \$9.99 or less and still earn healthy margins. Retailers will likely continue to leverage lower wholesale prices and in the process move more Alaska sockeye through the supply chain. It is too early to speculate whether U.S. sockeye promotions can alleviate the supply pressure ahead of next season, but so far U.S. retail sales figures on sockeye are encouraging. Posting higher sales volumes during 2015 and early 2016 would put frozen Alaska sockeye in a better market position entering next season.



Retail Price Lag for Key Sockeye Products

Many fishermen have expressed frustration over lower ex-vessel sockeye prices and seemingly static retail prices. If ex-vessel prices are down more than 50 percent, why are sockeye still sold at retail for \$10 per pound or more? A pair of well-reported articles examining opposing sides of the subject were recently published. Alaska Journal of Commerce reporter DJ Summers summarized the angst felt by fishermen and pointed out that

retailers have little incentive to lower prices now that U.S. consumers are used to paying premium prices for Alaska sockeye fillets (link: <http://www.alaskajournal.com/2015-11-04/confluence-factors-causing-disconnect-salmon-pricing>). John Sackton, the best-known seafood trade press reporter in America, used Urner Barry data on sockeye promotional activity to analyze retailer behavior. In Sackton's view, retailers are behaving normally in response to lower commodity prices (link: <http://www.seafoodnews.com/Story/997520/US-Retail-Sockeye-Fillet-Prices-Falling-in-Normal-Pattern>).

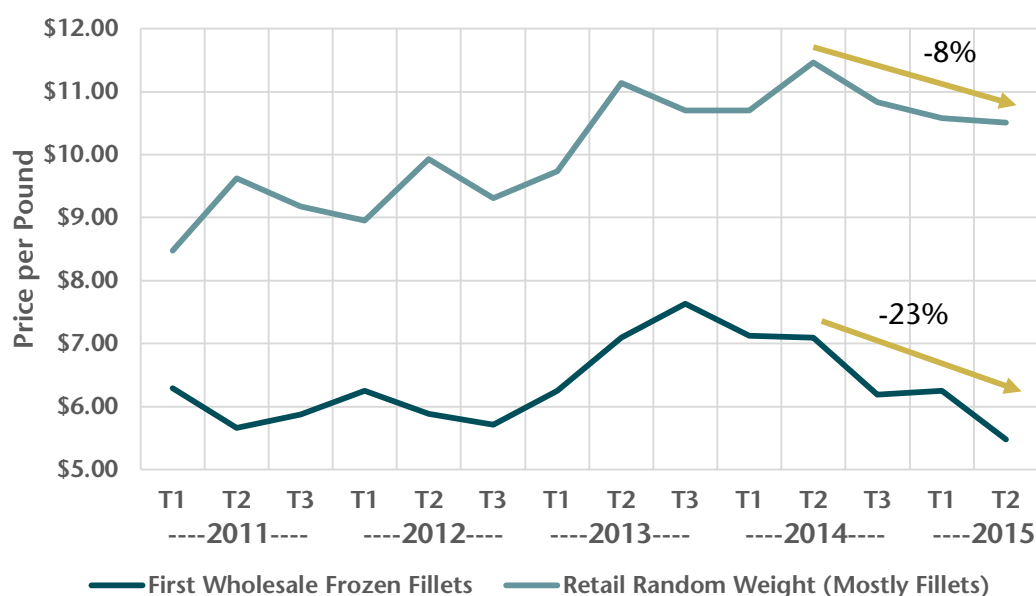
McDowell Group used retail point-of-purchase data and ASPR first wholesale sales data to examine the issue. That examination suggests there is some validity to both viewpoints expressed in the Summers and Sackton articles. Retailers have lowered sockeye prices for both fillets and canned sockeye in response to lower commodity prices; however, not nearly to the degree witnessed in the wholesale market.

Sockeye Fillets

Key Finding: An extensive review of proprietary retail data on sockeye sales suggests retailers are reacting to lower wholesale prices by significantly increasing off-peak promotions and slowly lowering prices. Alaska producers increased retail sales volume through a successful series of in-store sockeye demonstrations between April and early June 2015, coordinated by the Alaska Seafood Marketing Institute. Additional demonstrations were conducted in October 2015 and more are being planned for the 2016 Lenten season.

Figure 13 shows the difference in average price by trimester for sockeye fillets at the retail and first wholesale level. Wholesale prices peaked in late 2013 and have fallen 23 percent, or \$1.61 per pound, since the second trimester last year. Retail prices are only down 8 percent, or \$0.96 per pound. Admittedly, this comparison is somewhat skewed by the fact that the second trimester tends to see higher retail prices due to the fresh sales season. However, the gap in frozen fillet pricing during the important second-trimester was significantly higher in 2014 and 2015 than any of the prior three years.

Figure 13. Average Retail and First Wholesale Price of Sockeye Fillets, by Trimester, 2010-2015



Source: Urner Barry and ADOR (ASPR).

Prior to last summer, retailers maintained upward price momentum even though wholesale fillet prices began declining in late 2013. John Sackton provides a good explanation of why retail prices for fillets lag behind the wholesale market:

Retailers buy on programs that are often locked in months in advance, and they sell their products out of inventory, or contracted fresh deliveries. No retailer can take the chance of running promotions without having locked in the volume and price of the product they anticipate.

As a result, for frozen fillets, they are working down inventories that were purchased at a higher price than current market conditions.

Retail Seafood Departments tend to be evaluated on their gross margins, and as a result a retailer will do everything possible to maintain his margin. That means if he has several hundred thousand pounds of frozen sockeye fillets purchased at a higher price the retailer will sell them off at a high price, maintaining margins, until they are mostly gone.

Despite the lag, there is little doubt that retailers seized the opportunity to increase margins on sockeye products during the summer of 2014 and 2015 by limiting discounts. Now that the summer sales season is over, will retailers lower prices to stimulate off-peak sales this fall?

POP data purchased for this project only extends through August 9, 2015. Based on retail information from the Urner Barry Retail Features database, the average price of advertised sockeye fillets through the first week of November is down \$0.37 per pound (-4 percent) since August 2015. The number of grocery stores running sockeye promotions this fall is also up significantly. These actions support the theory that retail sockeye prices are reacting to lower wholesale prices, meaning retail sockeye prices will likely continue to decline through at least next spring.

ASMI IN-STORE ALASKA SOCKEYE PROMOTIONS

The Alaska Seafood Marketing Institute (ASMI) partnered with 10 different U.S. retail chains in 2015 to operate over 5,000 in-store demonstrations using frozen Alaska sockeye fillets between April and early June. The demonstrations were held in over 4,500 stores across the country (some stores held multiple demonstrations). The promotion included displays and advertisements of Alaska sockeye, and most retailers offered promotional prices on sockeye fillets to help stimulate sales.

The project's performance was outstanding. Retailers reported increased sales figures ranging from 26 to 243 percent over the same time. A review of POP data shows that the sales volume of U.S. retail sockeye fillets increased 28 percent (1.0 million pounds) overall between March 22, 2015 and June 14, 2015.

ASMI coordinated an additional 660 demonstrations which wrapped up in October 2015. More demonstrations are being planned for the 2016 Lent season.

Canned Sockeye

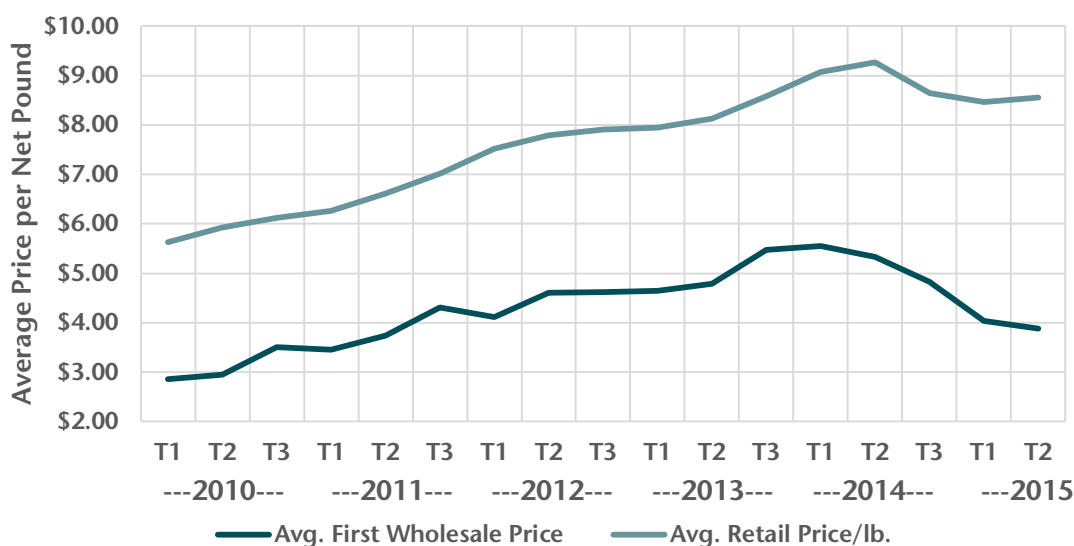
Key Findings: U.S. retail prices for canned sockeye tend to track changes in first wholesale price, but respond slowly to shifts in wholesale price trends. Similar to fillets, first wholesale prices for canned sockeye products have decreased faster than retail prices, resulting in a larger difference between the two market segments.

Retail prices for canned sockeye respond slowly to changes in the wholesale market because the product is shelf-stable and generally has lower turnover than fresh/frozen product. Frozen products are generally sold within 12 to 18 months of being caught, but canned sockeye has a shelf life of up to five years or more. This means retailers are more concerned with earning a margin on the cost basis of their own inventory, rather than adjusting retail prices to changes in the wholesale market.

Canned prices at the retail and first wholesale level have followed the same trend in recent years; however, prices tend to change more gradually in the retail market. First wholesale prices ran out of steam in late 2013, but retail prices did not decline until a year later (see Figure 14). The difference between the two has widened significantly since late 2013. As retailers purchase more product at lower prices to replace higher priced inventory, the retail prices should gradually decline.



Figure 14. Average U.S. Retail and First Wholesale Price of Canned Sockeye, by Trimester, 2010-2015



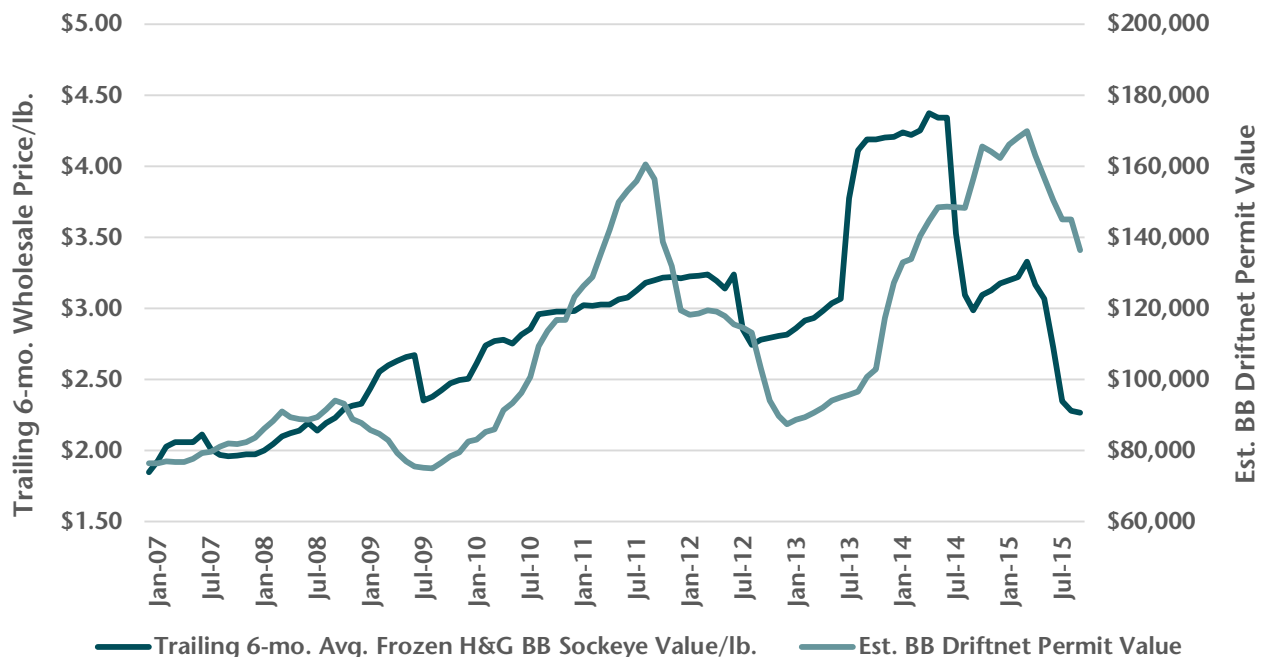
Source: IRI, Inc. and ADOR (ASPR).

Impact of Value and Pricing on Bristol Bay Driftnet Permit Values

Clearly, there is a strong link between wholesale and ex-vessel prices. A relevant question for fishermen is: how does pricing and resource value impact the value of Bristol Bay driftnet permits? McDowell Group compared average permit value data from CFEC with ex-vessel and first wholesale data to investigate the relationship. The analysis suggests there is a consistent relationship between total ex-vessel value for Bristol Bay sockeye and wholesale prices for frozen H&G sockeye have been a leading indicator of permit values in recent years.

Through September 2015, the estimated Bristol Bay driftnet permit value is down 20 percent from its peak of \$169,900 in March 2015. The trailing six-month average first wholesale price of frozen H&G Bristol Bay sockeye is down 32 percent during the same time. Changes in wholesale prices for frozen sockeye have been a leading indicator of changes in permit values in recent years. Not surprisingly, declining wholesale prices and ex-vessel value suggests the value of Bristol Bay driftnet permits may fall further. The last time (trailing six-month average) wholesale prices for frozen Bristol Bay sockeye were below \$2.27/lb. the average permit value was less than \$94,100, or about \$42,000 less than the most recently available data on current permit value (\$136,300 as of September 2015).

Figure 15. Bristol Bay Driftnet Permit Value and First Wholesale Frozen H&G Prices for Bristol Bay Sockeye, 2007-2015

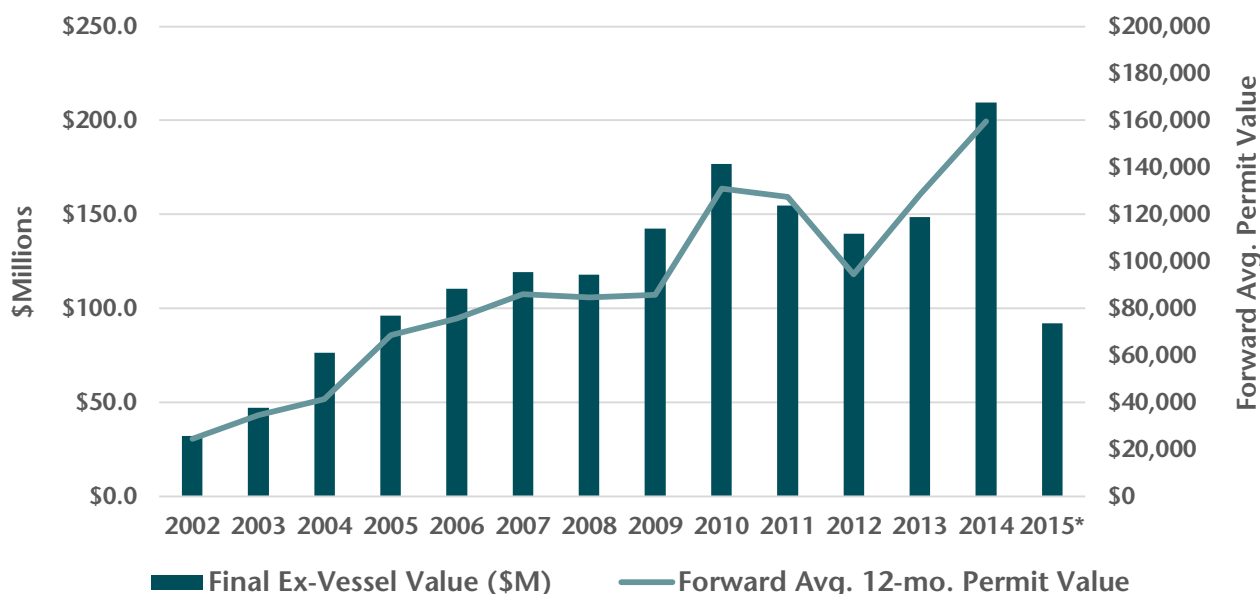


Source: ADOR (ASPR) and ADF&G (CFEC), compiled by McDowell Group.

Historically, the total ex-vessel value of Bristol Bay sockeye is highly correlated with permit value movements occurring during the ensuing twelve months. Intuitively, this makes sense as higher gross earnings increase the market value of fishery access. The final ex-vessel value of the fishery will not be known until next spring;

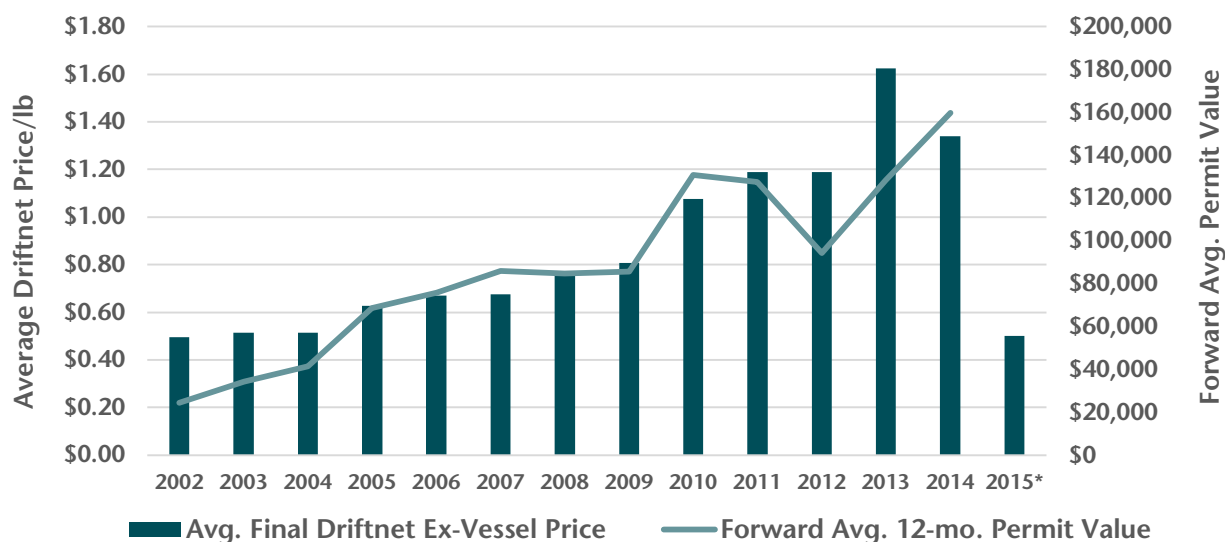
however, 2015 will be down significantly from the prior year. Permit values began declining prior to the 2015 season, but the chart in Figure 16 below will not have a 2015 data point for 12-month forward permit value until July 2016. Readers should note the 2015 ex-vessel value is preliminary and will increase to some degree once additional bonus/adjustment payments are made.

Figure 16. Forward Value of Bristol Bay Driftnet Permits and Total Bristol Bay Sockeye Ex-Vessel Value, 2002-2015



*Ex-vessel value for 2015 is preliminary, reflecting only base prices. Prior years are "final" values including chilling bonuses and other adjustments not included in 2015 data.
Source: ADF&G (COAR, Fish Tickets, and Area Biologist estimates) and ADF&G (CFEC), compiled by McDowell Group.

Figure 17. Forward Value of Bristol Bay Driftnet Permits and Final Driftnet Ex-Vessel Price per Pound for Sockeye, 2002-2015



*Ex-vessel price for 2015 reflects the average base prices. Prior years contain "final" prices including chilling bonuses and other adjustments not included in 2015 data.
Source: ADF&G (COAR, Fish Tickets, and Area Biologist estimates) and ADF&G (CFEC), compiled by McDowell Group.