BSAI Crab Rationalization EDR Audits

Report Prepared for Pacific States Marine Fisheries Commission

2014 Calendar Year Data

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AKT
CPAs AND BUSINESS CONSULTANTS

TABLE OF CONTENTS

Background

The Bering Sea and Aleutian Islands (BSAI) Crab Rationalization Program was developed to create a quota system that grants exclusive harvesting and processing rights to crab harvesters, processors and communities. The rationalized fishery began in fall 2005 with quota allocated to harvesters and processors based on historical participation in the fishery. Because of the expected impact on the industry, an economic data collection program was developed to better understand the economic impacts on the industry.

Economic data reports (EDRs) were developed to obtain information about the crab operations of harvesters and processors to help monitor how costs and economic returns of various stakeholders in BSAI crab fisheries are affected by rationalization. In order to ensure that the data submitted by respondents in the EDRs is accurate, Congress and the North Pacific Fishery Management Council specified that EDR data be subject to mandatory audits conducted by the third party collection agent, Pacific States Marine Fisheries Commission (PSMFC). PSMFC contracted AKT to develop and implement an EDR review and verification system which involves reviewing the data contained within submitted EDRs, conducting verification audits for those EDRs containing data values outside of the expected range, and conducting random audits for a certain percentage of submitted EDRs.

The EDRs were developed to help determine the effects of the rationalization program, including changes to the costs of production and the effect of consolidation. National Marine Fisheries Service (NMFS) sought to understand the general trends over the years and the effects of rationalization to translate to other fisheries that are beginning similar programs.

This validation process is a continuation of similar work done in years 2006 to 2013. Prior years' data is audited in the current year; for example the 2014 data was audited in 2015.

In summary, the purpose of the economic data report and data validation is to:
1) Aid the Council and NMFS in assessing the success of the program;
2) Understand the economic performance of crab fisherman;
3) Understand how the economic performance has changed after rationalization;
4) Isolate the effects attributable to the crab rationalization program;
5) Assess the validity of data reported in submitted EDRs; and
6) Provide guidance on improvements in the EDR process to improve the validity of future data reporting.

Key Participants and Roles

The key participants in the project include:
- *National Marine Fisheries Service (NMFS)* – initiator of the audit process and end-user of the information contained in the EDRs.
- *Pacific States Marine Fisheries Commission (PSMFC)* – collector and manager of the data collected through the EDRs.
- *AKT LLP* – independent accountants and consultants selected to audit and validate the information collected in the EDRs.
- Participants in the crab rationalization program.

Scope of Work

The following procedures were requested to be performed in the scope of work for this project:

1) *Random Audits* – Review and verification of a subset of data values reported in a randomly selected sample of EDRs.

2) *Outlier Audits* – Review and verification of data values reported in EDRs that contained multiple outlier variables. These outliers were identified through analysis performed by NMFS. Analysis is conducted as needed, based on prior year audit results and statistical analysis.

3) *For Cause Audits* – Review and verification of data values reported in EDRs that were non-compliant or that failed the audit process in the previous EDR calendar year.

The methodology to address the procedures above is outlined later in this report.

Based upon conversations with NMFS and PSMFC, the key objectives of the audit were outlined as follows:

▪ Validate key data reported by crab rationalization program participants in the Catcher Vessel (CV), Catcher/Processor (CP), and Shoreside Processor (SP) EDR forms.

▪ Identify problems with the data or EDR instructions and make suggestions for future reporting

▪ Promote compliance with timely and accurate data reporting requirements

▪ Identify appropriate changes to data when missing or incorrect

▪ Characterize, and in some cases quantify, the level of accuracy associated with particular data elements

Key Information

The current analysis is based on the data collected from participants of the BSAI crab rationalization program for the year 2014. A statistical sample was determined based upon a total submitted population of 97, which was comprised of all unique submitters of information. The sample was determined based upon achieving a 95% confidence level with a precision level of 15% in terms of assessing the accuracy of the submitted data (see Appendix A for detailed discussion of the statistical basis of the sample). The following table summarizes the number of EDRs submitted by type and the resulting sample size.

Type	# of EDRs Submitted 2014	Sample Size 2014
Catcher Vessel	75	23
Catcher Processor	2	1
Shoreside/Floating Processor	20	6

AKT, PSMFC and NMFS worked together to determine the best process to analyze data submitted through the EDR process and to determine the methodology to sample and audit the data submitted in the EDRs. The process was based on prior year experience with improvements made to benefit the participants. The following is a summary of the steps taken throughout the audit process.

1) *Determine appropriate variables to validate.* The significance of the data for random audits and available audit evidence is considered when determining the appropriate variables to validate. This is a collaborative process between PSMFC, NMFS and AKT.

2) *Determine population subject to random audit.* The sample size is determined using a statistical model with a 95% confidence level and a 15% precision level. See Appendix A for a discussion of the statistical basis used for selection.

3) *Determine outlier audit population.* Based upon its analysis of the EDR data without vessel identity, NMFS identifies the population that it desires to validate through an outlier audit. These audits focus on EDRs for which significant outliers were identified through analytical review. Six vessels were identified as having outlier variables for the 2014 EDR data year.

4) *Determine for-cause audits.* Vessels selected for for-cause audits are those that did not comply with an audit request in the previous year. 11 vessels were selected for audit in the 2014 EDR data year as a result of a failed audit in the prior year.

5) *Gather and crosscheck EDR data to be audited.* EDR data pertaining to the variables selected for auditing are transferred to AKT from PSMFC. AKT uses a standard auditing analysis spreadsheet and imports data from PSMFC into this format.

6) *Request information subject to audit for random, outlier and for-cause audits.* Selected vessels and processors are asked to provide supporting information for the variables selected for validation. They are given one month to comply with the request, though extensions are granted on an as-needed basis. If the selected vessels and processors do not comply within one month, they are individually contacted and additional contact efforts are made as needed to ensure that each selected vessel and processor has an opportunity to respond in a timely manner.

7) *Validate information by comparing with supporting documentation.* AKT reviews the supporting documentation submitted by vessels and processors and compares the supported values to those submitted on the original EDR. Detailed notes regarding the basis and quality of information are maintained in order to evaluate the validity of selected data. The vessels or processors are contacted as needed for further clarifications and additional supporting documents.

8) *Summarize the results of the audit verification process.* Each audited variable is classified within a support category, which classify and summarize the validity of the audit evidence received, allowing for effective and meaningful overall analysis.

9) *Compile a burden hour estimate.* Selected vessels and processors are asked to estimate the amount of time dedicated to compiling their EDR submissions. The resulting responses are summarized into estimated burden hours by respondent type.

Audit Methodology

AKT selects vessels or processors for random audit based upon the statistical sample outlined in Appendix A. AKT works with NMFS and PSMFC to determine the appropriate variables to validate.

For each data variable requested, AKT critically evaluates the support provided by the selected vessel or processor. Information is evaluated against third party support, such as invoices or fish tickets; internally-generated information, such as crew settlement sheets, general ledger details, invoices, detailed internal reports, or financial statements; and estimates made, including an assessment of the reasonableness of assumptions. Supporting documentation for internally-generated spreadsheets is requested on a judgmental basis. AKT also notes when no support is available to evaluate the information.

Many of the records provided to AKT are unique, specific to the vessels. The processor reporting tends to be more formal and standardized, reflecting the large company nature of those operations. Because the material provided is so unique, the audit process begins with a detailed review of each information packet received while comparing totals for each variable to the original EDR entry. Each supporting document is assessed for accuracy and depth of support. Estimates are accepted as long as a reasonable explanation and/or calculation are also provided. Handwritten statements are also considered adequate, but only after discussion with the EDR preparer and requests for additional support.

If discrepancies are found between the original EDR submission and the supporting documentation provided, AKT contacts the vessel owner and/or preparer to validate the corrected value. Many times this discussion leads to the receipt of additional documentation and/or further explanation as to the methodology used to report EDR values.

If the initially provided documentation is determined to be incomplete or insufficient, then AKT contacts the vessel or processor to request further documentation. Once this additional documentation is received, it is assessed and validated via the process described above.

AKT worked jointly with PSMFC and NMFS to develop the following classifications to describe audit evaluations and summarize the results of the audited values.

Validation Code Original Value	Is original value substantiated?	Is audited value substantiated?	Nature of Reporting Error	Correction	Validation Code - Audit Value
1	Yes	Yes (same)	No error; reported value is clearly substantiated by complete records	No	1
1T	Yes	yes (same)	Original value is blank or N/A	No	1
2	Yes	Yes (same)	Calculation error	Yes	1
2T	Yes	Yes(same)	Typographical Error	Yes	1
3	Yes	Yes (same)	Misinterpretation of question	Yes	1
4	Yes	Yes (same)	Estimate is based on original documentation but flawed assumption/logic	Yes	4
5	Yes	Yes (same)	Data cannot be reported precisely as specified in EDR form and must be estimated; estimate is based on appropriate documentation and sound assumptions/logic and is considered validated	No	5
6	Yes	Yes (updated)	Original value was reported correctly based on original documentation, but corrected based on updated documentation	Yes	1
7	No	No	Reported value is "best guess"; value is not derived from records	No	7
8	No	Yes (new)	Original value is unsubstantiated; correction based on new documentation	Yes	1
9	No	No	No data reported	Yes - "Corrected Value is -9"	9
10	No	No	Item "Not Applicable" to vessel	Yes - "Corrected Value is -7"	10

The records of 34 catcher vessels were requested and 30 were received. Three vessels did not respond to the requests for audit documentation and one vessel was granted a medical waiver. In the current year, nine vessels selected for random audit did not require follow-up information requests. Two catcher vessels submitted audit documentation but did not respond to the requests for additional support. All other catcher vessels complied with AKT's requests for additional support.

AKT analyzed the audit codes assigned to each of the vessels in order to document consistent errors for each variable, along with the reasoning behind the error.

The total number of audit codes possible was determined by the number of EDR variables requested from selected vessels. The 34 catcher vessels that were selected for the audit produced a total of 739 audit codes. The distribution of those audit codes is summarized on the following page. Where significant, a breakdown of the variables receiving the reporting errors is included.

Code - Original Value	Code - Audit Value	Nature of Reporting Error	Number of Occurrences	Percentage
1	1	**No error; reported value is clearly substantiated by complete records**	**485**	**65.63%**
		Table 2- Pounds Transferred	*152*	
		Table 2 - Total Cost	*130*	
		Table 3 - Captain Labor Payment	*60*	
		Table 3 - Captain Benefits	*67*	
		Table 4 - Food and Provisions-Total Cost	*50*	
		Table 5 - Fuel Cost - Annual Gallons	*14*	
		Table 5 - Annual Cost	*12*	
1T	1	**Original value is blank, or N/A**	**0**	**0.00%**
2	1	**Calculation error**	**8**	**1.08%**
2T	1	**Typographical Error**	**7**	**0.95%**
3	1	**Misinterpretation of question**	**10**	**1.35%**
4	4	**Estimate is based on original documentation but flawed assumption/logic**	**0**	**0.00%**
5	5	**Data cannot be reported precisely as specified in EDR form and must be estimated; estimate is based on appropriate documentation and sound assumptions/logic and is considered validated**	**2**	**0.27%**
6	1	**Original value was reported correctly based on original documentation, but corrected based on updated documentation**	**47**	**6.36%**
		Table 2- Pounds Transferred	*21*	
		Table 2 - Total Cost	*21*	
		Table 3 - Captain Labor Payment	*2*	
		Table 4 - Food and Provisions-Total Cost	*1*	
		Table 5 - Fuel Cost - Annual Gallons	*1*	
		Table 5 - Annual Cost	*1*	
7	7	**Reported value is "best guess"; value is not derived from records**	**0**	**0.00%**
8	1	**Original value is unsubstantiated; correction based on new documentation**	**90**	**12.18%**
		Table 2- Pounds Transferred	*24*	
		Table 2 - Total Cost	*43*	
		Table 3 - Captain Labor Payment	*5*	
		Table 4 - Food and Provisions - Total Cost	*3*	
		Table 5 - Fuel Cost - Annual Gallons	*8*	
		Table 5 - Fuel Cost - Annual Cost	*7*	
9	9	**No data reported**	**90**	**12.18%**
		Table 2- Pounds Transferred	*25*	
		Table 2 - Total Cost	*25*	
		Table 3 - Captain Labor Payment	*10*	
		Table 3 - Captain Benefits	*10*	
		Table 3 - Crew Labor Payment	*3*	
		Table 4 - Food and Provisions - Total Cost	*8*	
		Table 4 - Crab Bait Purchased - Total Cost	*1*	
		Table 5 - Fuel Cost - Annual Gallons	*4*	
		Table 5 - Fuel Cost - Annual Cost	*4*	
10	10	**Item "Not Applicable" to vessel**	**0**	**0.00%**

Non-Error Audit Codes

Of the twelve possible audit codes, four do not represent actual errors. These codes are:

- 1-1
- 1T-1

- 5-5
- 10-10

Only two of the four non-error audit codes were used and comprise of 65.9% of all catcher vessel audit codes used, with 1-1 and 5-5 claiming 65.63% and .27% respectively.

Audit codes 1T-1 and 10-10 were not used.

Error Audit Codes

AKT analyzed the following results for the remaining audit codes, which are used to categorize errors:

- 2-1
- 2T-1
- 3-1
- 4-4

- 6-1
- 7-7
- 8-1
- 9-9

Audit code 9-9 was the error code used most frequently at 12.18%.   This audit code was documented across most variables and indicates that the processor did not report any data. Of the number of variables that this code was used for, the majority are related to three catcher vessels that did not supply any audit documentation for the 2014 year.

Audit code 8-1 was also documented at 12.18% of the time.   This audit code was documented across most variables and indicates that the vessel's original submission was incorrect, but that adequate documentation was provided to support the revised value. In some instances the vessels acknowledged the original error, and in others AKT determined the existence of the error based upon the audit information provided and conversations with the vessels. Anecdotal evidence suggests that vessels do not always thoroughly review their records to report an accurate EDR number initially, and only revise the figures when forced to look more closely at their own data to produce auditable support for AKT.

Audit code 6-1 was documented 6.36% of the time. This audit code was documented across most variables and indicates the vessel's original submission was correct, but has been updated based on new information.

Three additional audit codes appeared in a fraction of the catcher vessels: calculation errors (**2-1**) at 1.08%, typographical errors (**2T-1**) at 0.95%, and misinterpretation of the question (**3-1**) at 1.35%.

Audit codes 1T-1, 4-4, 7-7, and 10-10 were not used.

The records of seven processors were requested and five packets were received. Two of the selected processors did not provide any audit documentation. All other processors complied with AKT's requests for additional support.

AKT analyzed the audit codes assigned to each of the processors in order to document consistent errors for each variable, along with the reasoning behind the error.

The total number of audit codes possible was determined by the number of EDR variables requested from selected processors. The six shoreside/floating processors and one catcher processor produced a total of 254 audit codes. The distribution of those audit codes is summarized below.

Code - Original Value	Code - Audit Value	Nature of Reporting Error	Number of Occurrences	Percentage
1	1	**No error; reported value is clearly substantiated by complete records**	43	**16.93%**
1T	1	**Original value is blank, or N/A**	0	**0.00%**
2	1	**Calculation error**	6	**2.36%**
2T	1	**Typographical Error**	0	**0.00%**
3	1	**Misinterpretation of question**	121	**47.64%**
		Table 2a - Product Code	8	
		Table 2a - Process Code	8	
		Table 2a - Box Size Code	8	
		Table 2a - Finished Pounds	8	
		Table 2a - Gross Revenue	8	
		Table 2b - Product Code	15	
		Table 2b - Process Code	15	
		Table 2b - Box Size Code	15	
		Table 2b - Finished Pounds	15	
		Table 2b - Gross Revenue	15	
		Table 4 - Cost	4	
		Table 9 - Fuel Cost - Total Gallons	1	
		Table 9 - Fuel Cost - Total Cost	1	
4	4	**Estimate is based on original documentation but flawed assumption/logic**	0	**0.00%**
5	5	**Data cannot be reported precisely as specified in EDR form and must be estimated; estimate is based on appropriate documentation and sound assumptions/logic and is considered validated**	4	**1.57%**
6	1	**Original value was reported correctly based on original documentation, but corrected based on updated documentation**	4	**1.57%**
7	7	**Reported value is "best guess"; value is not derived from records**	0	**0.00%**

8	1	Original value is unsubstantiated; correction based on new documentation	30	11.81%
		Table 3 - Raw Pounds Purchased	2	
		Table 3 - Gross Payment	3	
		Table 4 - Product Code	5	
		Table 4 - Pocess Code	5	
		Table 4 - Raw Pounds	5	
		Table 4 - Finished Pounds	5	
		Table 4 - Cost	5	
9	9	No data reported	25	9.84%
		Table 3 - Raw Pounds Purchased	1	
		Table 4 - Product Code	4	
		Table 4 - Pocess Code	4	
		Table 4 - Raw Pounds	4	
		Table 4 - Finished Pounds	4	
		Table 4 - Cost	4	
		Table 7 - Number of Non-Processing Employees	2	
		Table 7 - Total Wages	2	
10	10	Item "Not Applicable" to vessel	21	8.27%
		Table 1 - IFQ Type	7	
		Table 1 - Pounds Sold	7	
		Table 1 - Gross Revenue	7	

Audit code 1-1 accounted for 16.93% of variables tested. This has decreased significantly from prior year audits. The decline is related to two processors that did not submit the requested audit documentation and one vessel that did not originally submit their EDR for table 4. This caused a high number of variables to have 9-9 or 8-1 audit codes. Also, the decline can be related to one processor who had 115 error codes due to original reporting in the wrong EDR tables.

In total, non-error audit codes (1-1, 5-5, and 10-10) comprised 26.77% of processor audit codes used. Without the processors that did not submit any information, the processor that did not submit their original EDR, and the processor who reported in the incorrect tables, this total is 76.4%. Non-error audit code 1T-1 was not used.

Error Audit Codes

AKT analyzed the following results for the remaining audit codes:

Audit code 3-1 was the error code used most frequently at 47.64%. This audit code was documented across all variables and indicates that the processor misunderstood the question. Of the number of variables that this code was used for, the majority are related to one processor that reported values in the incorrect tables, which were updated with subsequent information.

Audit code 8-1 was documented 11.81% of the time. This code was documented across multiple variables and indicates that the vessel's original submission was incorrect, but that adequate documentation was provided to support the revised value. In some instances the vessels acknowledged the original error, and in others AKT determined the existence of the error based upon the audit information provided and conversations with the vessels. Anecdotal evidence suggests that the vessels do not always thoroughly review their records to report an accurate EDR number initially, and only revise figures when forced to look more clearly at their own data to produce auditable support for AKT.

Audit code 9-9 was used at 9.84%. This audit code was documented across most variables and indicates that the processor did not report any data. Of the number of variables that this code was used for, the majority are related to two processors that did not supply any audit documentation for the 2014 year.

Two additional audit codes appeared in a fraction of the catcher vessels: calculation error (**2-1**) at 2.36% and original value was reported correctly based on original documentation, but corrected based on updated documentation, (**6-1**) at 1.57%.

Audit codes 1T-1, 4-4, and 7-7 were not used.

OUTLIER AUDIT CODE ANALYSIS

Through the NMFS analysis process described in the Methodology section of the report, six vessels were selected for outlier audits. AKT received support for the unique variables identified by NMFS for each of the six entities selected. In the current year, one vessel selected for the outlier audit did not require additional requests. All other outliers complied with AKT's requests for additional support.

AKT analyzed the audit codes it assigned to each of the outliers in order to document consistent errors for each variable, along with the reasoning behind the error.

The total number of audit codes possible was determined by the number of EDR variables requested from the outliers, totaling 18. The distribution of those audit codes is summarized below.

Code - Original Value	Code - Audit Value	Nature of Reporting Error	Number of Occurrences	Percentage
1	1	No error; reported value is clearly substantiated by complete records	14	77.78%
1T	1	Original value is blank, or N/A	0	0.00%
2	1	Calculation error	4	22.22%
2T	1	Typographical Error	0	0.00%
3	1	Misinterpretation of question	0	0.00%
4	4	Estimate is based on original documentation but flawed assumption/logic	0	0.00%
5	5	Data cannot be reported precisely as specified in EDR form and must be estimated; estimate is based on appropriate documentation and sound assumptions/logic and is considered validated	0	0.00%
6	1	Original value was reported correctly based on original documentation, but corrected based on updated documentation	0	0.00%
7	7	Reported value is "best guess"; value is not derived from records	0	0.00%
8	1	Original value is unsubstantiated; correction based on new documentation	0	0.00%
9	9	No data reported	0	0.00%
10	10	Item "Not Applicable" to vessel	0	0.00%

Audit code 1-1 was used most frequently, at 77.78%, with overall non-error codes (1-1) totaling 77.78%.

Audit code 2-1 was used 22.22% of the time and was used on fuel variables. This audit code indicates that the entity miscalculated data when submitting EDR, but adequate documentation was provided to support the revised value.

Audit codes 1T-1, 2T-1, 3-1, 4-4, 5-5, 6-1, 7-7, 8-1, 9-9, and 10-10 were not used.

In addition to assessing the distribution and use of the various audit codes, AKT analyzed the EDR variables which were most frequently not supported by direct documentary evidence. This lack of support includes both errors and the necessary use of estimates.

Random Audit – Catcher Vessel EDR Records

AKT identified six variables which received unsupported audit codes in greater than 30% of instances. Vessels were unable to substantiate these variables resulting in errors. A summary of those variables is provided below.

EDR Section (Year)	EDR Item Description/Year	# of Vessels Error	% of Vessels unable to substantiate
2.0 CR Crab Fishing Quota Costs	Pounds Transferred	72	32%
	Total Costs	94	42%
3.0 Crab Crew Labor Costs	Crew Labor	3	100%
4.0 Vessel Operating Expenses, by CR Fishery	Crab Bait Purchased - Total Cost	1	100%
5.0 Vessel Operating Expenses, Annual	Fuel Cost - Annual Gallons	19	58%
	Fuel Cost - Annual Cost	21	64%

Nearly one-third of vessels received an unsupported audit code for the pounds transferred and over one-third received an unsupported audit code for total costs portions of *Table 2 – CR Crab Fishing Quota Costs, by CR Fishery and Quota Type: Market-Value and Negotiated Price Transfers Only*. This rate of unsubstantiation is in large part due to three vessels that did not provide the requested audit documentation. Additionally, some of the vessels originally reported pounds transferred and sold in the incorrect IFQ Type.

The variables for crew labor and crab bait purchased in *Table 3 –CR Crab Crew Labor Payments, by CR Fishery* and *Table 4-Vessel Operating Expenses, by CR Fishery* elicited unsupported audit codes for 100% of vessels due solely to the three vessels that did not provide the requested audit documentation.

Over half of the vessels received an unsupported audit code for the fuel cost-annual gallons and fuel cost-annual cost portions of *Table 5 – Vessel Operating Expenses, Annual*. This rate of unsubstantiation is in large part due to the three vessels that did not provide the requested audit documentation. Additionally, some of the vessels originally reported the cost of fuel used instead of purchased, and some of the vessels original data could not be substantiated, but corrected values could based on vessel supplied audit documentation.

Random Audit – Processor EDR Records

As noted in the Processor Audit Code Analysis section, two of the vessels did not submit the requested audit documentation, one vessel did not submit EDR information originally (account for 25 error codes) and one vessel misunderstood the question and reported numbers in the wrong sections (accounting for 115 error codes), resulting in a high number of error audit codes in total. Once these processors were removed it was noted that the quality of submissions was very high, with 76.4% of variables receiving a 1-1, 5-5, or 10-10 audit code. Accordingly, analysis of frequent errors is not material to the processors.

As a result of its analysis and contact with the vessels and processors selected for audit, AKT asked all vessels and processors to provide information regarding the time commitment (burden hours) to prepare original EDR submissions for PSMFC and to prepare submissions for AKT.

Catcher Vessels EDR Form

A summary of the burden hours estimated by the responsive vessels is included below. Note that four vessels provided estimates as to the amount of time taken to prepare the initial EDR, while three provided estimates for the time spent preparing supporting materials for validation.

Original EDR Submission to PSMFC			EDR Validation to AKT		
Burden Hour Estimate Range	Number of Vessels	Percentage	Burden Hour Estimate Range	Number of Vessels	Percentage
< 5 hours	3	50.0%	< 3 hours	4	66.7%
6 - 10 hours	3	50.0%	4 - 6 hours	2	33.3%
11 - 15 hours	0	0.0%	7 - 9 hours	0	0.0%
16 - 20 hours	0	0.0%	10 - 12 hours	0	0.0%
> 20 hours	0	0.0%	> 13 hours	0	0.0%

Estimates regarding the time required for catcher vessels to complete the original EDR submission ranged from 4 hours to 10 days. The distribution of the vessels that took less than and more than 20 hours was 100% and 0%, respectively.   See the chart below for a comparison of 2013 and 2014 burden hour estimates.
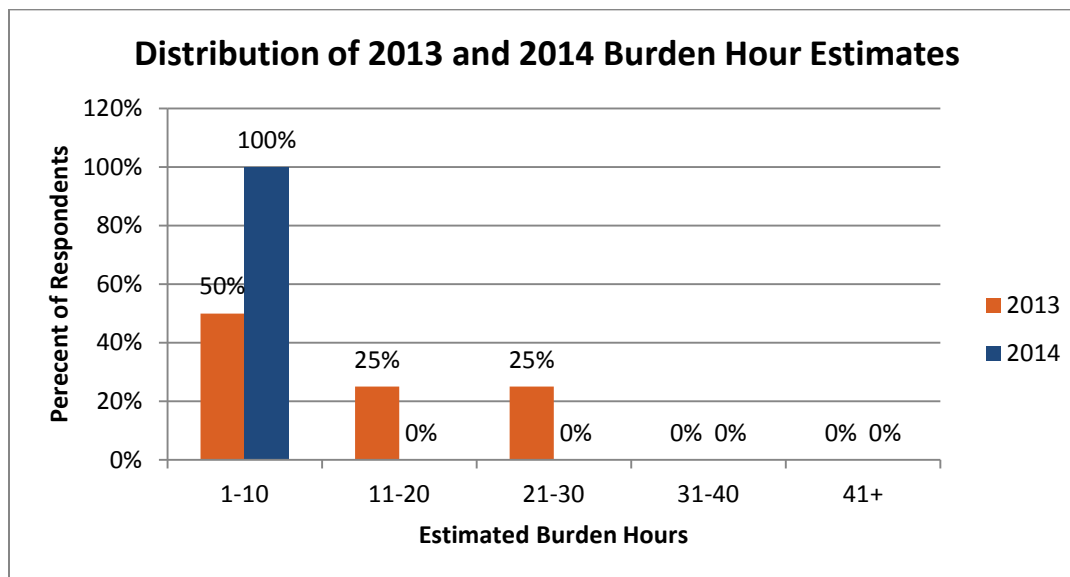
Distribution of 2013 and 2014 Burden Hour Estimates

Estimates regarding the amount of time needed to compile documentation for AKT after being selected for audit ranged from 1 hour to 7 hours, with 67% of vessels spending less than 3 hours on the process.

Shoreside Processor EDR Form

A summary of the burden hours estimated by the responsive processors is included below. Note that 2 processors provided estimates as to the amount of time taken to prepare the initial EDR and provided estimates for the time spent preparing supporting materials for validation.

Original EDR Submission to PSMFC			EDR Validation to AKT		
Burden Hour Estimate Range	Number of Processors	Percentage	Burden Hour Estimate Range	Number of Processors	Percentage
< 5 hours	0	0.0%	< 3 hours	1	50.0%
6 - 10 hours	1	50.0%	4 - 6 hours	0	0.0%
11 - 15 hours	0	0.0%	7 - 9 hours	1	50.0%
16 - 20 hours	0	0.0%	10 - 12 hours	0	0.0%
> 20 hours	1	50.0%	> 13 hours	0	0.0%

Estimates regarding the time required for processors to complete the original EDR submission ranged from 8 hours to 24 hours, with the distribution of processors taking less than and more than 20 hours at 50% and 50% respectively. As was noted for the vessels, the time burden has remained consistent with the prior year.

Estimates regarding the amount of time needed to compile documentation for AKT after being selected for audit ranged from 2 hours to 8 hours.

See Appendix B for detailed results of burden hour inquiries.

AKT worked collaboratively with members of the PSMFC and NMFS staff and would like to thank them for their commitment and time.

Name	Organization
Dave Colpo	Pacific States Marine Fisheries Commission
Geana Tyler	Pacific States Marine Fisheries Commission
Brian Garber-Yonts	National Marine Fisheries Service
Audit participants	Individual vessels and/or processors

The 2014 EDR yielded a high response rate from all catcher vessels and catcher, floating and shoreside processors. The vessels that contained errors on their submissions were corrected easily by contact with the vessel or by the addition of new information to substantiate the data reported.

AKT appreciates the opportunity to work with PSMFC and NMFS staff. This collaborative relationship is critical to AKT's success in completing this yearly audit.

Statistical Sample

In order to determine an appropriate sample size as the basis of selection for the random audits, the main criteria to consider are the level of precision desired, the level of confidence or risk and the degree of variability in the attributes being measured. These elements are defined as follows:

- *Level of Precision* – Also referred to as the margin of error, this is the range in which the true point value of the population is estimated to be. This is expressed as a percentage ± the true value (e.g., ± 5%). Thus, if it is found from the sample that on average 15% of the fisherman did not submit data then is could be concluded that for the total population, between 10% and 20% of the fisherman have not submitted data.

- *Confidence Level* – The degree to which we are certain that a result or estimate obtained from the study includes the true population percentage, when the precision is taken into account. In a normal distribution, 95% of the sample values are within two standard deviations of the true population value. If 100 vessels were sampled, 95 would have the true population values within the range specified.

- *Degree of Variability* – This measures the variability within the population (e.g. Catcher Vessels, Catcher/Processor Vessels, Shore/Floating Processors, Large Vessels, Small Vessels). The more heterogeneous a population, the larger the sample size required to obtain a given level of precision. The more homogenous a population, the smaller the sample size required. A variability of 50% signifies the greatest variability.

Due to the variability within the industry and the variability of the data being analyzed, there is not one specific variable that can be used to create a statistical model that would enable AKT to calculate a standard deviation and regression analysis for the project. This fact places the project in a similar category as a questionnaire, political poll, surveys and extension program impacts.

While there are no statistical analyses that can be applied directly, there are similar projects that derive statistical sampling methods relating to extension program impact. In these projects the samples are used to evaluate a change made to the extension programs.

The following sampling formulas were used to ensure a statistical basis for the samples chosen:

$$n_0 = \frac{Z^2 (p)(q)}{(e)^2} \qquad\qquad n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

n_0 = Sample size
n = Sample size with finite population correction for proportions
Z = The number of standard deviations a point x is from the mean; is a scaled value
p = Population variability
$q = 1 - p$
e = The desired level of precision
N = Total population

For this project p (variability) equals .5 to account for maximum variability in the population.

This type of sampling methodology takes into account errors and missing information in the data. The precision level quantifies the tolerable level of error based on the sample size. This error level is then projected to the total population.

The samples were stratified based on the proportion of the group versus the total population. The reasoning behind this is that by sampling each individual population there would be no statistical basis for both the Catcher/Processor and Stationary/Floater Processors. The only way to have a statistical basis for this population would be to census the population. Because this is not a reasonable approach, AKT suggested that the population include all groups and then additional random audits be performed for the Catcher/Processor and Stationary/Floater Processor populations.

The sample population was ultimately chosen based upon a 95% confidence level with 15% precision and variability of 50% (due to the variability of the information requested). This method ensures the data are correct (outlier audits) and provides a process to measure the quality of data (random audits). This sampling method provides a statistical basis for future studies and gives the agencies a basis to measure the accuracy of the population data.

Time Burden Estimates

Time burden estimates for each respondent are summarized below:

Type	Original EDR Submission to PSMFC	EDR Validation to AKT
Catcher Vessel	6 hours	2 hours
Catcher Vessel	10 hours	6.25 hours
Catcher Vessel	3 hours	1 hour
Catcher Vessel	4 hours	3.5 hours
Catcher Vessel	4 hours	1.5 hours
Catcher Vessel	8 hours	2 hours
Shoreside Processor	24 hours	2 hours
Shoreside Processor	8 hours	8 hours