

APPENDIX A.

QA/QC Memo to Cathy Pearson

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Cathy D. Pearson
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[State of the Salmon](#)

Re: SoS Inventory QA/QC

Cathy,

I have been giving some thought to the data quality issue for the salmon data inventory records in ASDI. Clearly with the international scope of the SoS project, it would make sense to have some standardization of how a data quality parameter is set for the diverse data sets included in the inventory. We have previously come to the conclusion that having a statistic describing data quality would be unrealistic given the nature of salmon data. However, there have been some efforts to apply quality rankings or descriptors to salmon data. Knudsen, in *Sustainable Fisheries Management*, describes a system for ranking escapement data into four quality categories: Excellent, Good, Fair and Poor, with an additional category for “no method” or “no information”. ADF&G has adopted a similar ranking system that is applied across the data sources that are employed in the analysis for setting salmon escapement goals. An example of this is provided in Fair et al 2004 for escapement goals in Bristol Bay. Even with a qualitative system as described here, the classification of many data sets may ultimately come down to a professional judgment call. The attached tables 1-3 outline the data quality classification system that I am employing for the Bristol Bay proxy of ASDI.

Cheers,

James

Knudsen, E. Eric, 2000. *Managing Pacific Salmon Escapements: The Gaps Between Theory and Reality*. Chapter 17, pp 237-272, of *Sustainable Fisheries Management, Pacific Salmon*. Knudsen et al eds. CRC, Lewis Publishers.

Fair, L.F., B. G. Bue, R. A. Clark and J. J. Hasbrouck. 2004. Spawning escapement goal review of the Bristol Bay salmon stocks. Regional Informational Report No. 2A04-17. Alaska Department of Fish and Game, Division of Commercial Fisheries, Anchorage.

Table 1. Qualitative data quality descriptors used for escapement data-sets in ASDI.

Escapement Data Descriptor	Criteria
Excellent	<p>Escapement estimates with the highest level of accuracy and precision.</p> <p><u>Examples:</u> Weirs, some sonar projects, dams, towers, video projects</p> <p><u>Criteria:</u></p> <ul style="list-style-type: none"> • Daily counts • The period of operation brackets the entire spawning migration • Long standing and consistently practiced operational procedures • River bottom configuration, water velocity and other site specific factors are optimal
Good	<p>Escapement estimates with a relatively high level of accuracy and precision.</p> <p><u>Examples:</u> Weir, sonar, video, towers, aerial surveys, foot surveys, mark & recapture</p> <p><u>Criteria:</u></p> <ul style="list-style-type: none"> • Data collected a minimum of 2 days per week • Period of operation brackets the peak of the spawning migration • Long standing and consistently practiced operational procedures • River bottom configuration, water velocity and other site specific factors are less than optimal
Fair	<p>Escapement estimates with a relatively low level of accuracy and precision.</p> <p><u>Examples:</u> Some sonar projects, aerial surveys, foot surveys, mark & recapture</p> <p><u>Criteria:</u></p> <ul style="list-style-type: none"> • Data collected a minimum of 1 day every two weeks • Period of operation brackets the peak of the spawning migration • Operational procedures inconsistent • River bottom configuration, water velocity and other site specific factors are less than optimal
Poor	<p>Escapement indexed with the lowest acceptable levels of accuracy and precision.</p> <p><u>Examples:</u> Aerial surveys, foot surveys, mark & recapture</p> <p><u>Criteria:</u></p> <ul style="list-style-type: none"> • Only one or two observations made per year • Observations are not well correlated with the peak of the spawning migration • Operational procedures inconsistent • River bottom configuration, water velocity and other site specific factors are less than optimal

Table 2. Qualitative data quality descriptors used for harvest data-sets in ASDI.
Harvest Data

Harvest Data Descriptor	Criteria
Excellent	<p>Harvest estimates with the highest level of accuracy and precision.</p> <p><u>Examples:</u> ADF&G Commercial Harvest Fish Tickets</p> <p><u>Criteria:</u></p> <ul style="list-style-type: none"> • There is a well designed and reliable system for obtaining harvest information throughout the fishing season. • Compliance with harvest reporting procedures and regulations is high. • Harvest numbers have a high degree of accuracy with respect to time, location, fishing effort, and the numbers and weight of each species harvested.
Good	<p>Harvest estimates with a high level of accuracy and precision.</p> <p><u>Examples:</u> Commercial Harvest Fish Tickets, calibrated harvest surveys</p> <p><u>Criteria:</u></p> <ul style="list-style-type: none"> • There is a reliable system for obtaining harvest information. • Estimated data or parameters are based on sub-sampling • Compliance with harvest reporting procedures and regulations is high. • Harvest numbers have a relatively high degree of accuracy, some parameters such as non target species or average fish weights may be based on a sub sampled portion of the harvest. • Harvest number are obtained for weekly time periods throughout the fishing season.
Fair	<p>Harvest estimates with a relatively low level of accuracy and precision.</p> <p><u>Examples:</u> Un-calibrated harvest surveys, postal surveys, catch calendars, voluntary reporting.</p> <p><u>Criteria:</u></p> <ul style="list-style-type: none"> • There is a consistently applied system for obtaining harvest estimates. • Annual data are collected, and an annual harvest number is estimated. • Harvest estimates are corrected for un-reported harvest.
Poor	<p>Harvest estimates with a minimally acceptable level of accuracy and precision.</p> <p><u>Examples:</u> Un-calibrated harvest surveys, harvest projections</p> <p><u>Criteria:</u></p> <ul style="list-style-type: none"> • Harvest projections or estimates are based upon quantitative data collected at least once each three years.

Table 3. Qualitative data quality descriptors used for age, sex and size data-sets in ASDI.

Age, sex and size Data Descriptor	Criteria
Excellent	<p>Age structure, sex ratios and size estimates with the highest level of accuracy and precision.</p> <p><u>Examples:</u> <u>Criteria:</u></p> <ul style="list-style-type: none"> • Long standing and consistently practiced operational procedures that are consistent with techniques described in published literature. • Aging techniques are not compromised by scale absorption • Samples are stratified temporally to a minimum of two strata per week. • Samples are stratified spatially • Sufficient samples are taken per stratum to simultaneously estimate the true percentage of each age class within 5% of its true value 95% of the time.
Good	<p>Age structure, sex ratios and size estimates with a relatively high level of accuracy and precision.</p> <p><u>Examples:</u> <u>Criteria:</u></p> <ul style="list-style-type: none"> • Long standing and consistently practiced operational procedures that are consistent with techniques described in published literature. • Aging techniques are not compromised by scale absorption • Samples are stratified temporally to a minimum of one strata per week. • Samples are stratified spatially • Sufficient samples are taken per stratum to simultaneously estimate the true percentage of each age class within 5% of its true value 90% of the time.
Fair	<p>Age structure, sex ratios and size estimates with a relatively low level of accuracy and precision.</p> <p><u>Examples:</u> <u>Criteria:</u></p> <ul style="list-style-type: none"> • Consistently practiced operational procedures • Aging techniques are not compromised by scale absorption • Samples are stratified temporally to a minimum of one strata per month. • Sufficient samples are taken per stratum to simultaneously estimate the true percentage of each age class within 5% of its true value 90% of the time.
Poor	<p>Age structure, sex ratios and size estimates with the lowest acceptable level of accuracy and precision.</p> <p><u>Examples:</u> <u>Criteria:</u></p> <ul style="list-style-type: none"> • Operational procedures are described • Recognized aging techniques are used • Samples are stratified temporally to a minimum of one strata per fishing year. • Sufficient samples are taken per stratum to simultaneously estimate the true percentage of each age class within 5% of its true value 85% of the time.