AK Weights

## Introduction

In examination of the 2018 paper by Ruggerone and Irvine and specifically the associated supplementary data[[1]](#footnote-20), it would seem that more appropriate regional average weights for each of the species could have been used to convert adult abundance estimates to adult biomass for Alaska. This is specific to the 1985 to 2015 estimates. In 1985, Alaska Department of Fish and Game, Division of Commercial Fisheries modified Alaska’s Commercial Fisheries Regions from 3 regions (Southeast Alaska, Southcentral[[2]](#footnote-22), and Western Alaska) to the 4 current regions (Southeast Alaska, Central, Westward, and Arctic-Yukon-Kuskokwim). In 1985, Alaska also changed the reporting of commercial fisheries, sport fishing and subsistence catches to these regions for the annual NPAFC catch statistics (see Metadata report for details). This change means there is a discontinuity in the regional time series for Alaska data. Of particular note, some management areas were separated from the Central Region and the Western Alaska Region to a new region called Westward. The Westward Region includes Kodiak, Chignik and South Alaska Peninsula management areas (formerly included in Southcentral Region) and North Alaska Peninsula (formerly included in Western Region). Furthermore, starting in 1985, Bristol Bay Management Area (formerly Western Alaska) was included in Central Region. Note the similarity in names for the former **Western Alaska Region**, which included management areas from the North Alaska Peninsula and north to Kotzebue, and the current **Westward Region**, which includes both North and South Alaska Peninsula as well as Kodiak and Chignik.

The potential confusion between Western/Westard and Southcentral/Central appears to have lead to applying inaccurate average weights calculated from catch statistics sourced from the NPAFC database when estimating adult return biomass (Supplementary Tables 13-15) for Alaska pink, chum and sockeye salmon. Alternatively, this might have been a concious choice of the authors because these were the data that were readily available; however, this descion was not explicitly documented in their paper. As an example, we back-calculated the average weights used to estimate the adult return biomass for the Western Alaska region in Ruggerone and Irvine (2018) and compared them to the average weights for Western and Westard regions calculated from the NPAFC catch statistics database as described in Ruggerone and Irvine (2018) ([Figure 2](#fig-RIaverageweight)).

## Methods

* show how average weights calculated from NPAFC data were misapplied. Specifically, Westward average weights were used to convert AYK numbers to biomass and Central average weights were applied to management areas in Westward (NEED TO DOUBLE CHECK ON THIS)
  + essentially see if I can replicate R&I biomass estimates
* Need AK commercial harvest data (numbers and weights) that are supplied to NPAFC, but broken down by appropriate management areas. (use data supplied for ESR, but cross check with NPAFC provided data
  + Note - might need to pull data so splits Area M into North and South Pen (or do I?)
* Calculate annual average weights of fish for each species and management area and/or areas as specified in R&I then apply to their abundance estimates.
* Calculate difference in annual biomass for each area/AK/total

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| Figure 1: Average weights back-calculated from Ruggerone and Irvine (2018) for Alaska pink, chum and sockeye salmon by region, 1952-2015. |

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| Figure 2 |

Year avg\_wt avg\_wt.1 avg\_wt.2  
1 1952 1.568366 1.568366 NA  
2 1953 1.582993 1.582993 NA  
3 1954 1.575665 1.575665 NA  
4 1955 1.582986 1.582986 NA  
5 1956 1.547125 1.547125 NA  
6 1957 1.582628 1.582628 NA  
7 1958 1.552245 1.552245 NA  
8 1959 1.582325 1.582325 NA  
9 1960 1.772968 1.772968 NA  
10 1961 1.837957 1.837957 NA  
11 1962 1.384183 1.384183 NA  
12 1963 1.389321 1.389321 NA  
13 1964 1.363520 1.363520 NA  
14 1965 1.406593 1.406593 NA  
15 1966 1.414103 1.414103 NA  
16 1967 1.594901 1.594901 NA  
17 1968 1.477940 1.477940 NA  
18 1969 1.862732 1.862732 NA  
19 1970 1.634173 1.634173 NA  
20 1971 1.528338 1.528338 NA  
21 1972 1.481992 1.481992 NA  
22 1973 1.515116 1.515116 NA  
23 1974 1.839517 1.839517 NA  
24 1975 1.321112 1.321112 NA  
25 1976 1.552530 1.552530 NA  
26 1977 1.644827 1.644827 NA  
27 1978 1.479682 1.479682 NA  
28 1979 1.641453 1.641453 NA  
29 1980 1.488791 1.488791 NA  
30 1981 1.534743 1.534743 NA  
31 1982 1.458934 1.458934 NA  
32 1983 1.624368 1.624368 NA  
33 1984 1.517170 1.517170 NA  
34 1985 1.727679 NA 1.727679  
35 1986 1.628079 NA 1.628079  
36 1987 1.627432 NA 1.627432  
37 1988 1.673089 NA 1.673089  
38 1989 1.533841 NA 1.533841  
39 1990 1.417362 NA 1.417362  
40 1991 1.360577 NA 1.360577  
41 1992 1.572424 NA 1.572424  
42 1993 1.443018 NA 1.443018  
43 1994 1.611316 NA 1.611316  
44 1995 1.603837 NA 1.603837  
45 1996 1.525606 NA 1.525606  
46 1997 1.510397 NA 1.510397  
47 1998 1.653893 NA 1.653893  
48 1999 1.379880 NA 1.379880  
49 2000 1.429852 NA 1.429852  
50 2001 1.573438 NA 1.573438  
51 2002 1.667835 NA 1.667835  
52 2003 1.642697 NA 1.642697  
53 2004 1.613324 NA 1.613324  
54 2005 1.525007 NA 1.525007  
55 2006 1.659863 NA 1.659863  
56 2007 1.651022 NA 1.651022  
57 2008 1.597050 NA 1.597050  
58 2009 1.490253 NA 1.490253  
59 2010 1.615171 NA 1.615171  
60 2011 1.463963 NA 1.463963  
61 2012 1.615080 NA 1.615080  
62 2013 1.427595 NA 1.428552  
63 2014 1.444153 NA 1.581204  
64 2015 1.593834 NA 1.472599

1. Ruggerone & Irvine (2018), supplementary information: <https://afspubs.onlinelibrary.wiley.com/action/downloadSupplement?doi=10.1002%2Fmcf2.10023&file=mcf210023-sup-0001-TableS1-S24.xlsx> [↑](#footnote-ref-20)
2. The proper name for the region was Central, but is referred to as Southcentral in the NPAFC catch statistics database to avoid confusion because they encompass somewhat different geographic area. [↑](#footnote-ref-22)