Appendix C. Coastwide Pre-Recruit Indices from SWFSC and NWFSC/PWCC Midwater trawl Surveys (2001-2016)

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Introduction

This document provides an update of coastwide pre-recruit indices of abundance developed for past stock assessment cycles (Ralston et al. 2015), using data collected during SWFSC, NWFSC and PWCC/NWFSC midwater trawl surveys for young-of-the-year (YOY) pelagic juvenile groundfish. Due to time constraints and complications related to the discovery of a problem in how past indices were developed, this document reports indices for only a handful of those species typically evaluated, with a focus on those being assessed for the 2017 assessment cycle (bocaccio, blue/deacon and yellowtail) and one relatively abundant species from which to evaluate the consequences of the computational issues in past indices (shortbelly rockfish). Some preliminary explorations of an alternative means of developing indices are also included for consideration in review panels of those assessments.

In recent stock assessment cycles, these indices have been developed with guidance from the 2006 Pre-Recruit Survey Workshop (Hastie and Ralston 2007), such that data collected by these different surveys using identical gear and methods could be pooled to develop "coastwide" indices of abundance for YOY *Sebastes* spp. (see Ralston et al. 2013, Ralston and Stewart 2013 and Sakuma et al. 2016 for reviews of data, methods, vessel comparison and select results). This was in recognition that the data collected over a longer time period (1983-present) from the "core" area of the SWFSC survey were likely to present a biased and/or imprecise representation of coastwide YOY abundance due to significant interannual shifts in the spatial distribution of pelagic juvenile YOY (Ralston and Stewart 2013). However, variable ship availability and survey effort make the development of truly "coastwide" indices for some years impossible.

Data Analysis

As in recent assessment cycles, we used only years with the most comprehensive coverage to evaluate the spatial scope appropriate for each individual stock for which an index might be developed. Figure 1 shows haul locations for the different surveys over time, for the SWFSC (1983-2016, fixed stations), NWFSC (2011, 2013-2016, fixed stations) and PWCC/NWFSC (no fixed stations) datasets. Table 1 shows the total number of hauls by 2° latitude bins (the reported latitude in the Table represents the "mean" latitude for that bin, such that latitude 46 includes hauls from 45°- 47° N) for all of the survey data when pooled together. As the years 2004-2009 and 2013-2016 included very