Supplementary Material

Supplementary Material 1

General Catch and Survey Data Summaries

In general, the rockfish species diversity and quantity decreased in the catch data from east to west in the GOA (Supplementary Figure 2) with NPT and LL as the dominant gear types. Subareas 640 and 650 (Eastern GOA) and subarea 630 (eastern part of Central GOA) had the highest diversity and catch compared to other regions, while the highest diversity was observed in the lower southeast GOA. Some species were caught in most gears and subareas, such as yelloweye (*S. ruberrimus*), silvergray (*S. brevispinis*), redbanded (*S. babcocki*) and rosethorn (*S. helvomaculatus*; Supplementary Figure 2). In comparison, other species were only caught by specific gear, such as china rockfish (*S. nebulosus*) by LL and JIG (Supplementary Figure 2).

The two dominant gear types, NPT and LL, each had their highest catch in subarea 630 (Supplementary Figure 2). The NPT and PTR had higher catch of Other Rockfish species compared to the other commercial gear types (Supplementary Figure 2). The average annual catch across all subareas, excluding commercially targeted northern rockfish, for NPT was 805 mt compared to 324 mt for LL. However, LL caught more rockfish species in more subareas in the GOA. The JIG gear fishery mainly occurred in two subareas, 630 and 650, but had a similar catch composition as LL.

The two surveys, trawl and longline, tended to catch a different species composition from one another (Supplementary Figure 2). An average of 17 Other Rockfish species were caught by the trawl survey per year. However, there were eight species that constituted 90% of the total catch for the Other Rockfish complex, which were redbanded, silvergray, sharpchin (*S. zacentrus*), harlequin, yelloweye, redstripe (*S. proriger*), rosethorn and greenstriped (*S. elongates*). The longline survey caught an average of 1,340 individuals from the Other Rockfish complex per year with about 515 set-depth combinations. The longline survey typically caught 7 rockfish species in the Other Rockfish complex. Of the top five most commonly caught Other Rockfish species in the longline survey by numbers, only three (yelloweye, canary and rosethorn) have been designated to the Demersal Shelf Rockfish complex in subarea 650.
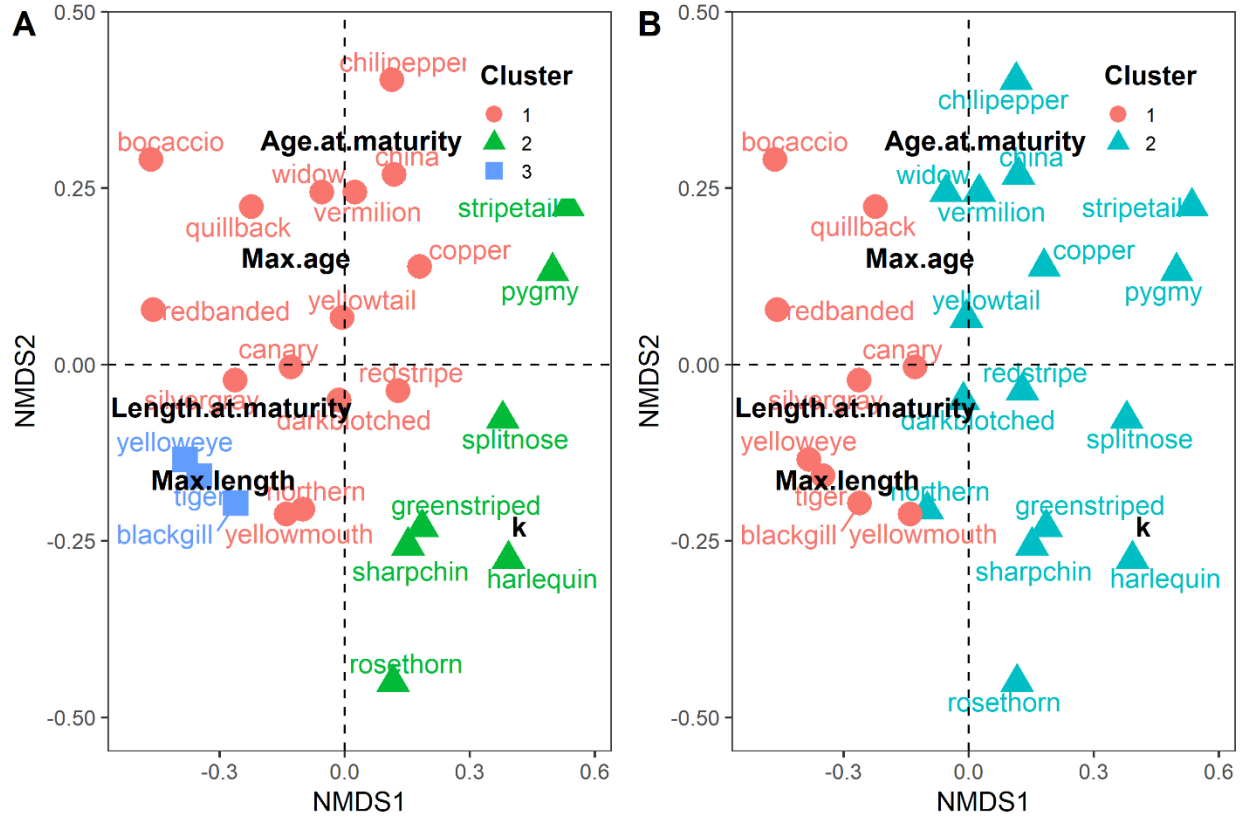
Supplementary Tables

Supplementary Table 1. Variance associated with each CCA axis from the CCA proportions matrix with units (year-month-subarea-gear).

| CCA Axis	Variance
1	0.3895
2	0.2542
3	0.1603
4	0.0434
5	0.0244
6	0.0176
7	0.0108
8	0.0081
9	0.0007
10	0.0001

Supplementary Figures
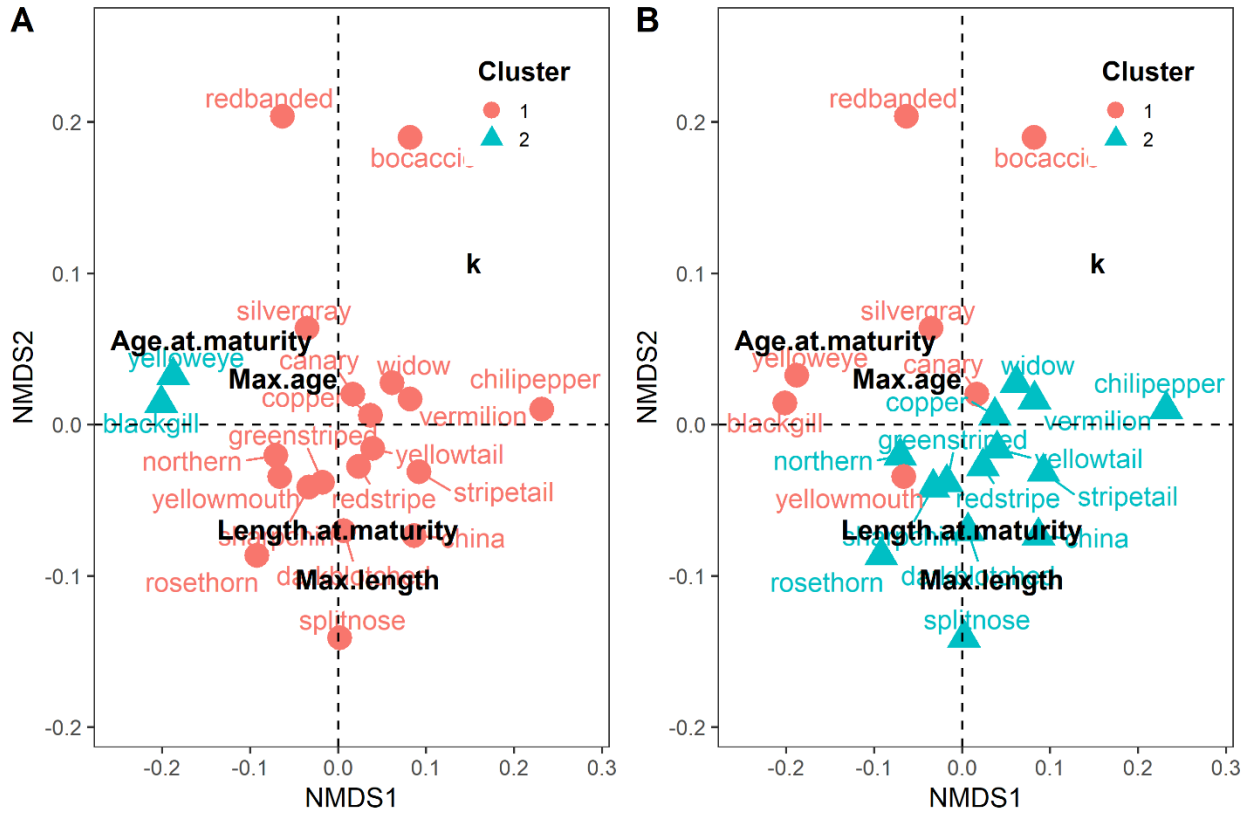
Supplementary Figure 1. NMDS plot of species' clusters identified from the life history table using species with all values (complete cases) from (A) Ward's hierarchical cluster analysis and (B) *k*-mediods.

Supplementary Figure 2. NMDS plot of species' clusters identified from the life history table with binned values (0-25%, 26- 50%, 51-75%, and 76-100% percentile bins) from (A) Ward's hierarchical cluster analysis and (B) *k*-mediods.
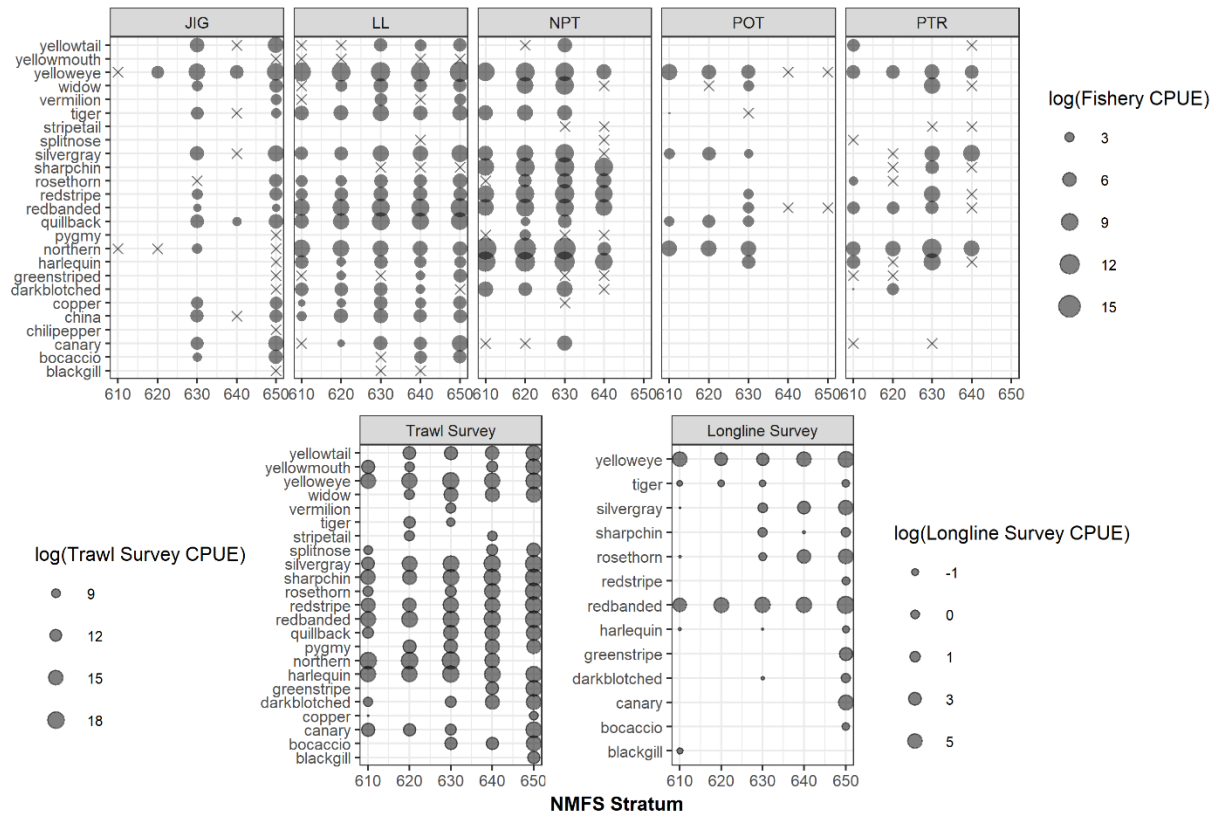
Supplementary Figure 3. Total log(CPUE) for each fisheries gear type (top panel; jig [JIG], longline hook and line [LL], non-pelagic trawl [NPT], pot [POT], and pelagic trawl [PTR]) in each NMFS subarea and survey gear (bottom panel; longline and trawl). CPUE is measured in metric tons caught per vessel trip for all fishery gear types, kilograms per km^2 swept for the trawl survey and number of individuals caught per hook set for the longline survey. NMFS subarea are arranged from 610 (western GOA) to 650 (southeastern GOA). Confidential data are indicated by an "x".
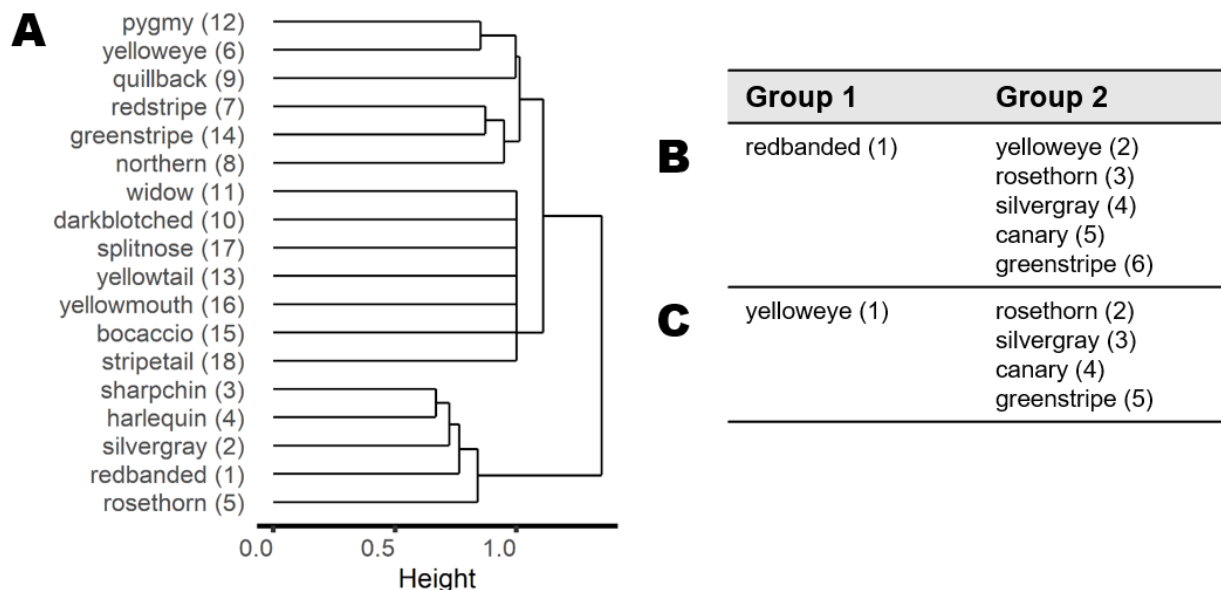
Supplementary Figure 4. Typical examples of results from cluster analyses using R-mode with individual sub-unit matrices. (A) A dendrogram of Ward's hierarchical cluster analysis using transformed presence-absence data from the NMFS bottom trawl survey in NMFS subarea 640. Suggested groupings from k-mediods based on the highest average silhouette width using transformed presence-absence data from the NMFS longline survey in NMFS subarea 650 with the rank of presence of rockfish from highest to lowest indicated by parentheses with (B) and without (C) redbanded rockfish, which is the most highly abundant species in subarea 650.
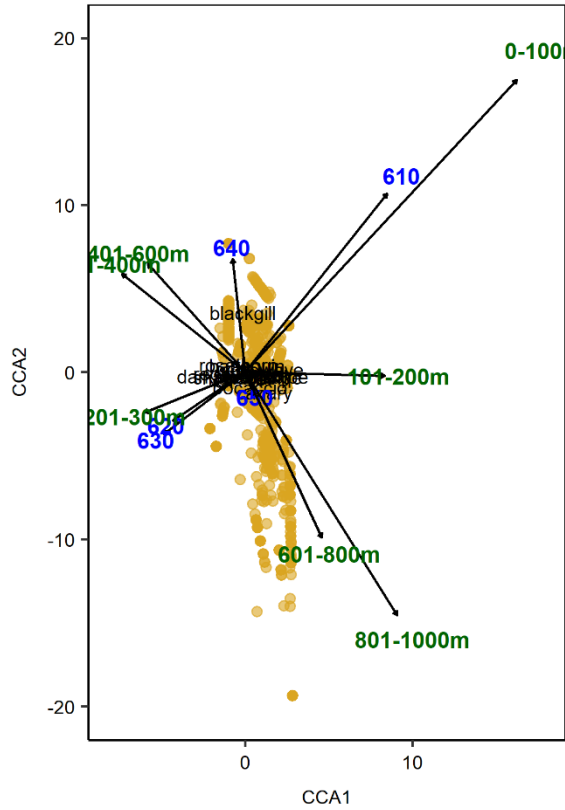
Supplementary Figure 5. Example of a CCA ordination using individual sub-unit matrix from the NMFS longline survey with individual haul units (points), species (black text) and additional environmental factors, including depth bins (green text) and NMFS subarea (blue text). Arrows indicate the strength and direction of the environmental factor.
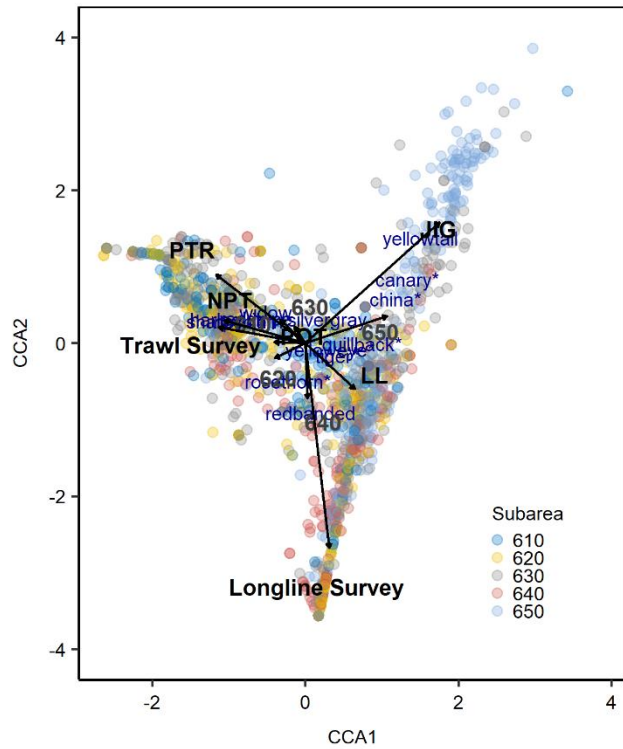
Supplementary Figure 6. CCA results using the proportions matrix with units (year-month-subarea-gear) plotted on the first two CCA axes with each unit color coded by NMFS subarea designation, species marked in blue text (with species currently assigned to the Demersal Shelf Rockfish marked with "*") and factors, gear and subarea, in black bold text.