# APPENDIX A TO THE PROPOSED ACCEPTABLE BIOLOGICAL CATCH AND OPTIMUM YIELD SPECIFICATIONS AND MANAGEMENT MEASURES FOR THE 2007-2008 PACIFIC COAST GROUNDFISH FISHERY

# AND

# AMENDMENT 16-4: REBUILDING PLANS FOR SEVEN DEPLETED PACIFIC COAST GROUNDFISH SPECIES

**PRELIMINARY DRAFT**

**JUNE 2006**

# SOCIOECONOMIC ENVIRONMENT

## A.1 Trends in Fishing and Seafood Processing Related Establishments and Employment in West Coast Fishing Communities (1997-2005)

Based on US-Census Bureau[1] data, trends in the number of fishing and seafood processing related establishments and employment (estimated) were determined for fishing communities in the states of California, Oregon and Washington. Using the ZIP Code Business Patterns[2] (CPB) data on the total number of establishments and employment, we will be able to provide information on the number of establishments per nine employment-size categories by industry category between 1997 and 2005.

At the same time we used the Economic Census[3] to take into account the Nonemployer Statistics which provide U.S. and subnational economic data by industry for businesses that have no paid employees and are subject to federal income tax. This series is useful for studying the economic activity of small businesses at various geographic levels.

The classification for fishing and seafood processing related activities, used by the CPB, is based on the North American Industry Classification System (NAICS) which assigns the industry code 1141--- for Fishing, and 3117--- for Seafood Product Preparation and Packaging. For the latter we will include Seafood Canning and Fresh and Frozen Seafood Processing together.

Regarding the reliability of the CPB data, it is important to state, that according to the Census Bureau, "all data are tabulated from universe files and are not subject to sampling errors. However, the data are subject to nonsampling errors. Nonsampling errors can be attributed to many sources: inability to identify all cases in the universe; definition and classification difficulties; differences in interpretation of questions; errors in recording or coding the data obtained; and estimation of employers who reported too late to be included in the tabulations and for records with missing or misreported data. The accuracy of the data is determined by the joint effects of the various nonsampling errors. No direct measurement of these effects has been obtained; however, precautionary steps were taken in all phases of collection, processing, and tabulation to minimize the effects of nonsampling errors."

At the end of this report, a preliminary overview of quarterly trends in employment and salaries is addressed using Census Bureau's Local Employment Dynamics[4] data starting in 2001. This data also included age and gender distribution among the employees population, among other Quarterly Workforce Indicators (QWI).

The data presented in this paper is still under analysis at the city and county level, therefore we are only able to present it at the state level.

### *A.1.1 Establishments*

The Census Bureau defines Establishment as "a business or industrial unit at a single location that distributes goods or performs services." It is not necessarily identical with a company, firm or enterprise, which may consist of one or more establishments. When two or more activities are carried on at a single location under a single ownership, all activities generally are grouped together as a single establishment.

[1] : http://www.census.gov/
[2] : http://censtats.census.gov/
[3] : http://www.census.gov/econ/census02/
[4] : http://lehd.dsd.census.gov/led/

The entire establishment is classified on the basis of its major activity and all data are included in that classification.

In the case of the Nonemployer Statistics it counts each distinct business income tax return filed by a nonemployer business as an establishment. Nonemployer businesses may operate from a home address or a separate physical location. Therefore, special note must be taken since most geography codes are derived from the business owner's mailing address, which may not be the same as the physical location of the business.

### *A.1.2 Employment estimation*

Based on the number of establishments per employment-size category we established the minimum and maximum number of employees per category, and calculated an average to provide an estimation of total employment. For example, in Table A.1-1 the total average number for the 114111 industry would be 54.5, which is the results of estimating an average from a total minimum number of employees of 26 (16 + 10) and total maximum of 83 (64 + 19).

**Table A.1-1. Example of table provided the Zip Code Business Patterns data**

| Industry Code | Industry Code Description | Total Est. | Number of Establishments by Employment-size class | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1-4 | 5-9 | 10-19 | 20-49 | 50-99 | 100-249 | 250-499 | 500-999 | 1000 or more |
| 114111 | Finfish Fishing | 17 | 16 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 311712 | Fresh and Frozen Seafood Processing | 3 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 |

### *A.1.3 Results*

These preliminary results will include the trends observed for each state and a list of the communities and/or counties included in the total estimations. The listed communities are those that have Census data for fishing and seafood processing related activities. At this time, Nonemployer Statistics are only available for the fishing-related activities.

#### A.1.3.1. Fishing (BCP)

According to NAICS, this industry comprises establishments primarily engaged in the commercial catching or taking of finfish, shellfish, or miscellaneous marine products from a natural habitat, such as the catching of bluefish, eels, salmon, tuna, clams, crabs, lobsters, mussels, oysters, shrimp, frogs, sea urchins, and turtles. For the purpose of this study we are only including establishments primarily engaged

in the commercial catching or taking of finfish (e.g., bluefish, salmon, trout, tuna) from their natural habitat.

The list of communities that take at least one finfish included:

*California*: Bodega Bay, Crescent City, Dana Point (Capistrano Beach), Eureka, Fort Bragg, Los Angeles, Monterey, Morro Bay, Oakland, Oceanside, Oxnard, Port Hueneme, Richmond, San Diego, San Francisco, Santa Barbara, Trinidad, and Ventura.

*Oregon*: Astoria, Brookings, Cannon Beach, Coos Bay, Florence, Garibaldi, Seaside, Hood River, Newport, Port Orford, Portland, Siletz, Waldport, Warrenton, and Reedsport (Winchester Bay).

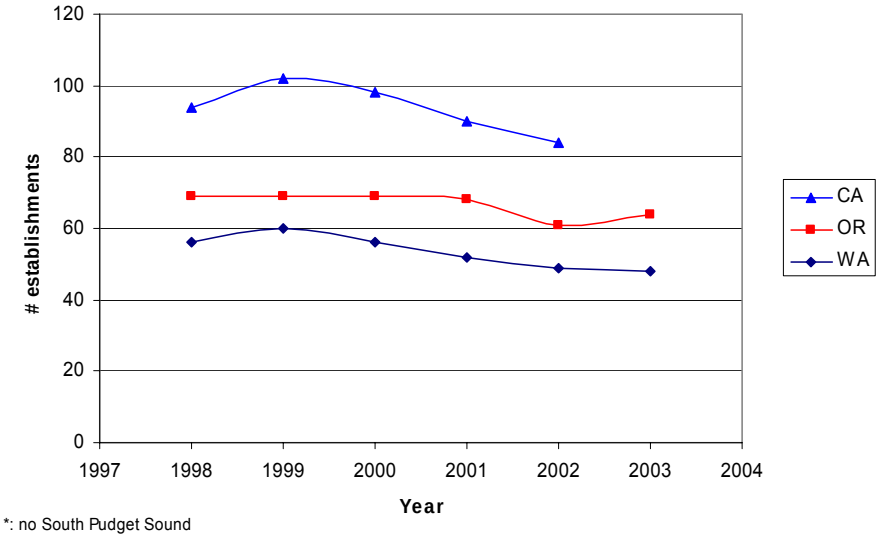
*Washington*: Anacortes, Bellingham, Blaine Chinook, Everett, Friday Harbor, Ilwaco, La Conner, Port Angeles, Port Townsend, Sequim, and Westport. In order to avoid inflating the data with the Alaska fisheries, the ports of Olympia, Seattle and Tacoma were not included in this study.

For the three states comparison we use CA data with the info of metro communities (Los Angeles – Long Beach, Oakland, San Diego, San Francisco and Ventura) that probably were misrepresented by the data collected by zip-code only.

Based on the trends observed in Figures A.1-1 and A.1-2, it could be inferred that after year 2000 there is a slight reduction in the number of establishments for California and Washington. Although no statistical analysis has been performed yet for this study, Oregon data seems to be no significant.

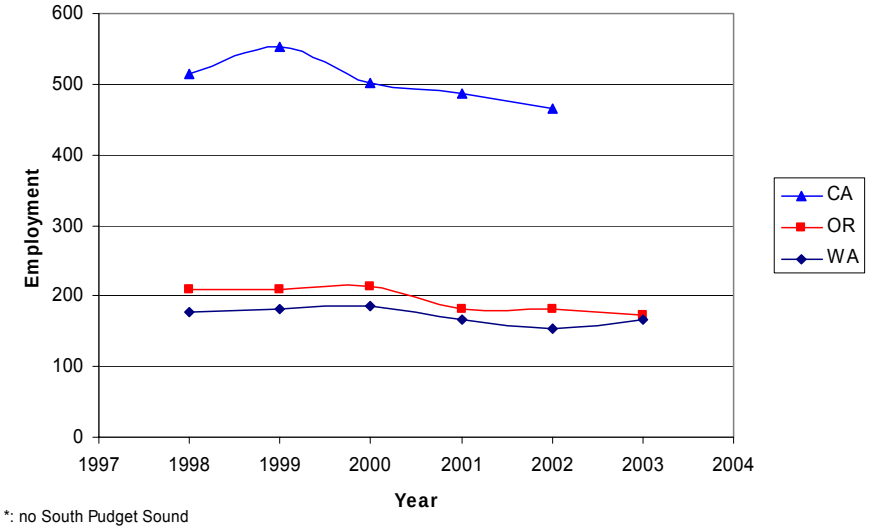
In the case of employment, the pattern seems to be the same for all these states.

**Figure A.1-1. California, Oregon and Washington's fishing-related establishments (1998-2003).**




*: no South Pudget Sound

**Figure A.1-2. California, Oregon and Washington's fishing-related employment (1998-2003)**




### A.1.3.2 Fishing (Nonemployer statistics)

Besides the number of the establishments, the Nonemployer statistics include the receipts, which are the gross receipts, sales, commissions, and income from trades and businesses, as reported on annual business income tax returns. Business income consists of all payments for services rendered by nonemployer businesses, such as payments received as independent agents and contractors.

The list of counties that take at least one finfish included:

*California*: Alameda, Contra Costa, Del Norte, Humboldt, Los Angeles, Marin, Mendocino, Monterey, Orange, San Diego, San Francisco, San Joaquin, San Luis Obispo, San Mateo, Santa Barbara, Santa Cruz, Solano, Sonoma, and Ventura.

*Oregon*: Clatsop, Columbia, Coos, Curry, Douglas, Hood River, Lane, Lincoln, Multnomah, and Tillamook.

*Washington*: Clallam, Clark, Cowiltz, Clark, Cowlitz, Grays Harbor, Island, Jefferson, Kitsap, Lewis, Pacific, Sam Juan, Skagit, Skamania, Snohomish, Thurston, Wahkiakum, and Whatcom.

With this data, we observe that despite of a decline in the number of establishments (Figure A.1-3) the gross receipts are increasing (Figure A.1-4). From this result it could be implied that less people are getting more profits from this activity (Figure A.1-5).

**Figure A.1-3. California, Oregon and Washington's Nonemployer fishing-related establishments (1997-2003)**

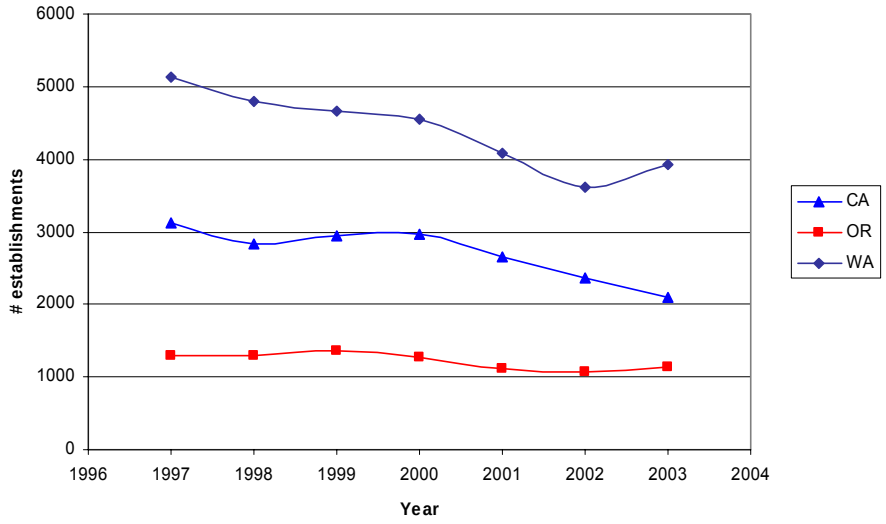



**Figure A.1-4. California, Oregon and Washington's Nonemployer fishing-related receipts (1997-2003)**

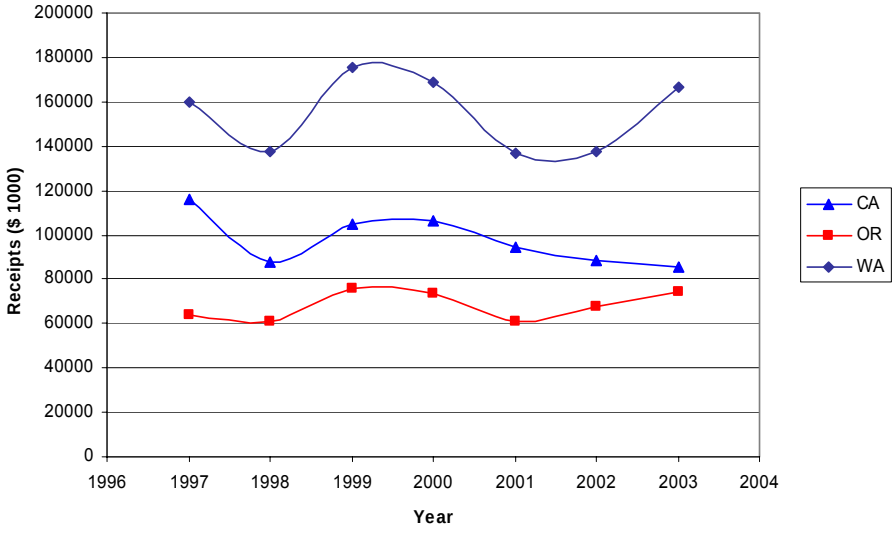
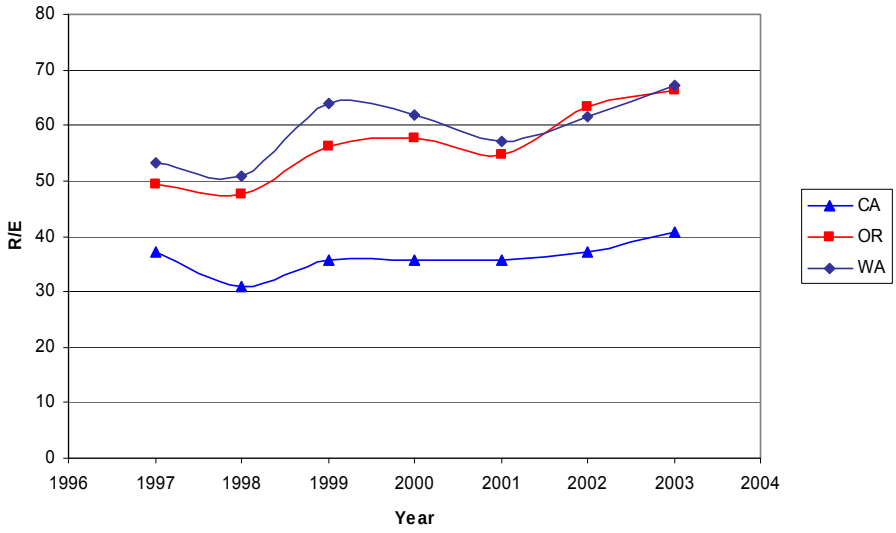


**Figure A.1-5. California, Oregon and Washington's Nonemployer fishing-related Receipts ($1000) per Establishment (1997-2003)**




### A.1.3.3. Seafood Product Preparation and Packaging

According to the NAICS, this industry comprises establishments primarily engaged in one or more of the following: (1) canning seafood (including soup); (2) smoking, salting, and drying seafood; (3) eviscerating fresh fish by removing heads, fins, scales, bones, and entrails; (4) shucking and packing fresh shellfish; (5) processing marine fats and oils; and (6) freezing seafood. Establishments known as "floating factory ships" that are engaged in the gathering and processing of seafood into canned seafood products are included in this industry.

The list of communities that have at least on establishment:

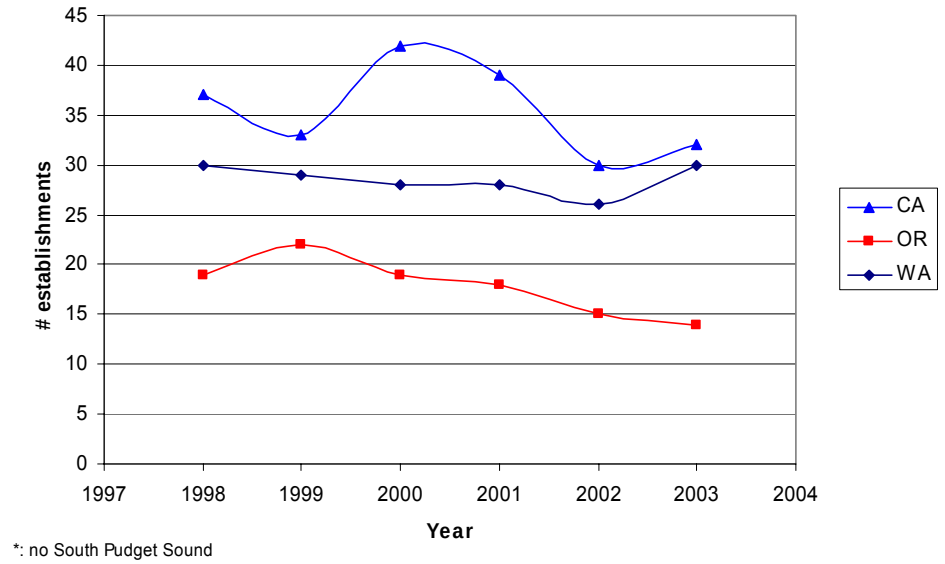
California: Crescent City, Eureka, Fort Bragg, Long Beach, Los Angeles, Monterey, Oxnard, Port Hueneme, Richmond, San Diego, San Francisco, Santa Barbara, and Ventura.

Oregon: Astoria, Brookings, Coos Bay, Florence, Garibaldi, Newport, Port Orford, Portland, Warrenton, and Reedsport (Winchester Bay).

Washington: Anacortes, Bellingham, Blaine Chinook, Everett, Friday Harbor, Ilwaco, La Conner, Neah Bay, Port Angeles, Sequim, and Westport. In order to avoid inflating the data with the Alaska fisheries, the ports of Olympia, Seattle and Tacoma were not included in this study.

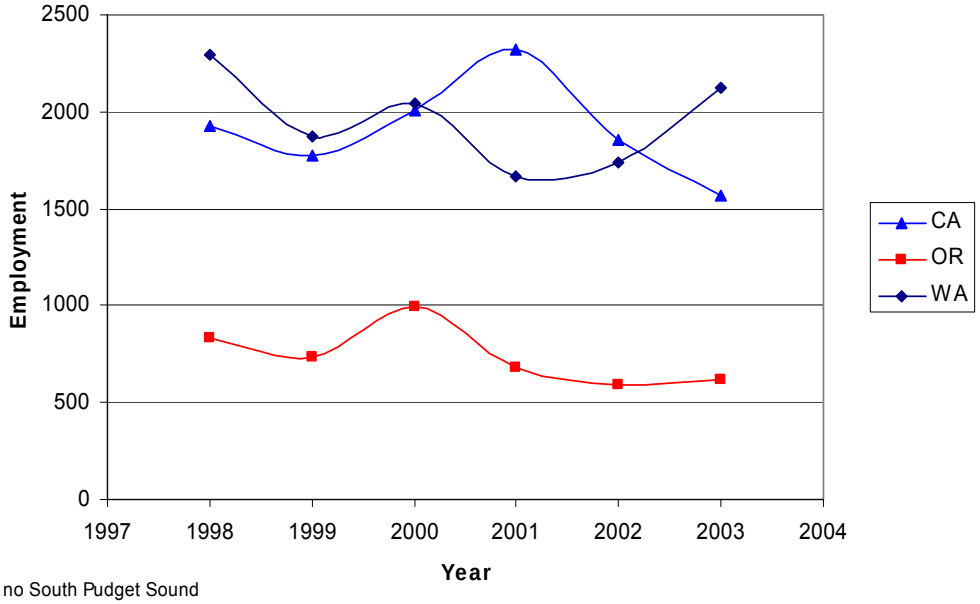
With this data, we observe that the trends in number of establishment and employment are very similar within each state (Figures A-1.6 and A-1.7).

**Figure A.1-6. California, Oregon and Washington's Seafood processing-related establishments (1998-2003)**




*: no South Pudget Sound

**Figure A.1-7. California, Oregon and Washington's Seafood processing-related employment (1998-2003)**




*: no South Pudget Sound

### A.1.3.4. Local Employment Dynamics (LED)

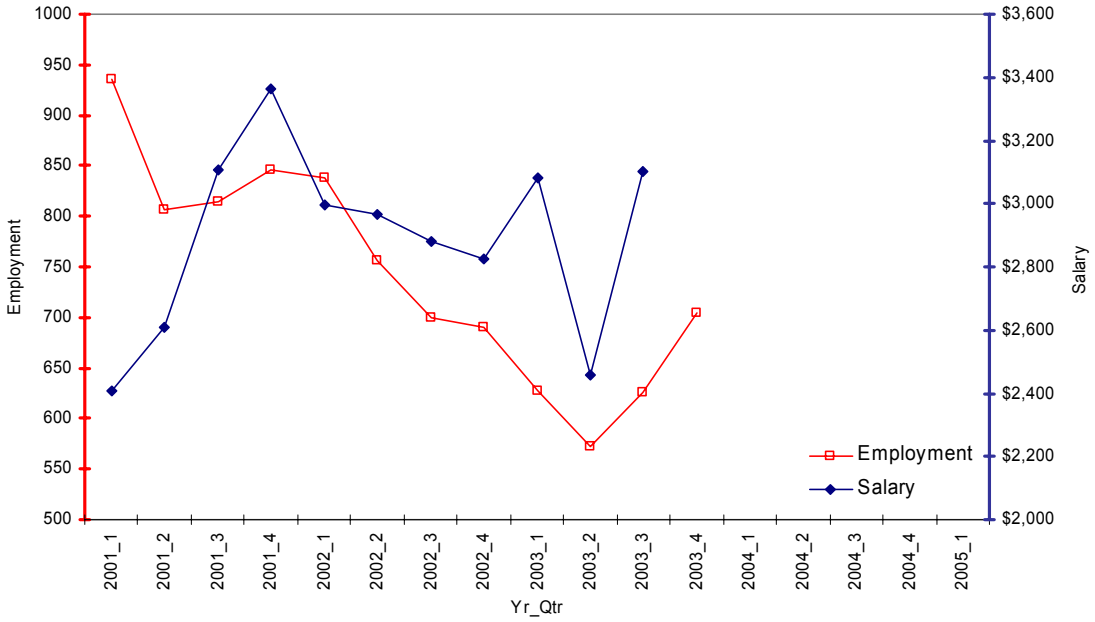
The Census Bureau publishes 8 (out of 29) labor force indicators in its Quarterly Workforce Indicators (QWI) online. The eight indicators include total employment measures of change such as job flow, new hires, separations, and average earnings. In this preliminary report we take into consideration two of them: total employment and average earnings.

In Figure A.1-8 (a, b, c), we present the quarterly trends in employment and salary in the fishing industry for the three states between 2001 and 2004 (actual years varies according the data availability for each state). For California and Oregon it could be noted that there was a decreasing trend in employment more noticeable in the former until the second quarter of 2003 (Fig. A.1-8a). At the same time, the state of Oregon (Figure A.1-8.b) presents a seasonal trend in which the third quarter of each year shows a peak in high salaries. This trend could be based on the small nature of the industry for Oregon if it were compared with the one of Washington in which a high amount of fishing comes from Alaska waters and does not necessarily reflect a seasonal pattern.

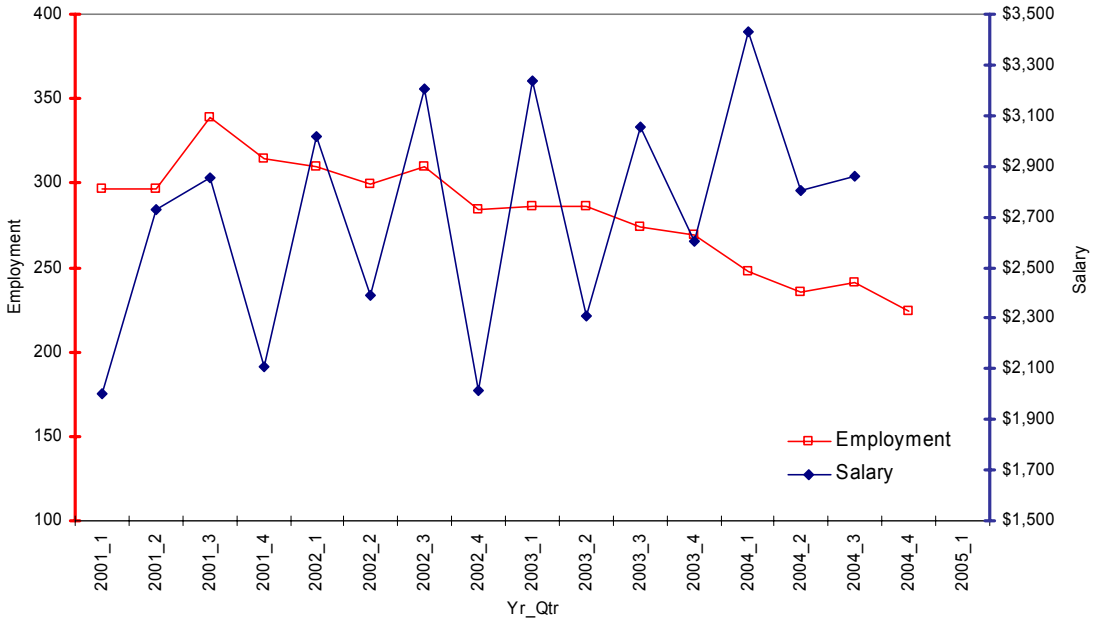
The same observation is applicable to the seafood processing industry in which Oregon shows the same patterns in employment and salaries (Figure A.1-9b), while the other two states do not. In the case of California, there are high levels of imports that do not necessarily reflect the seafood processing of local fisheries catches.

**Figure A.1-8. Quarterly fishing related employment and salaries by state (2001-2005)**

**a) California**



**b) Oregon**




**c) Washington**

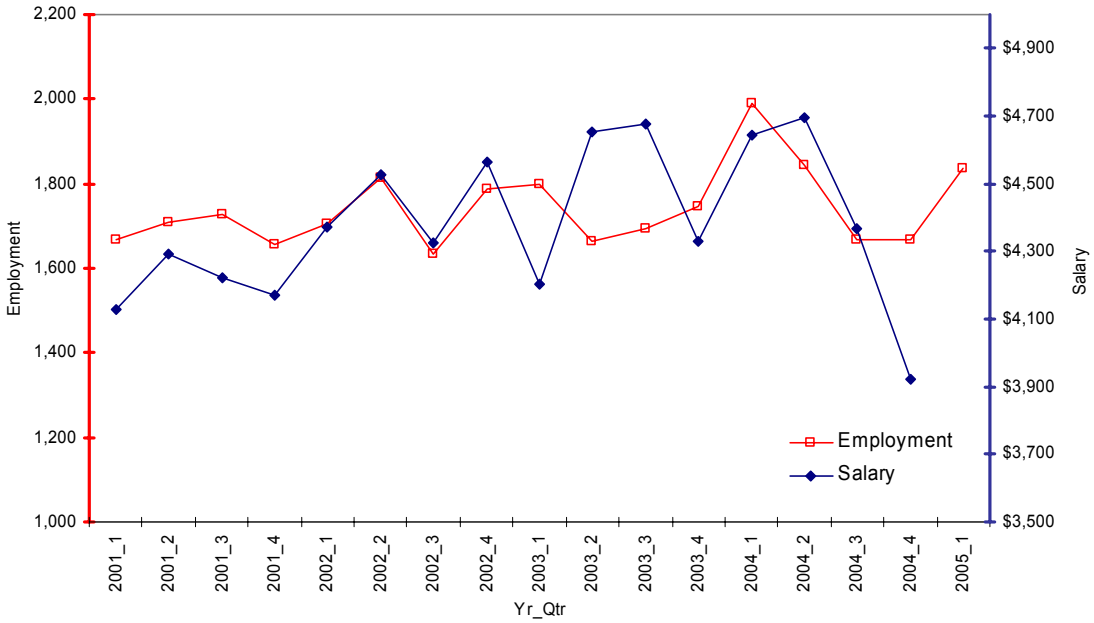
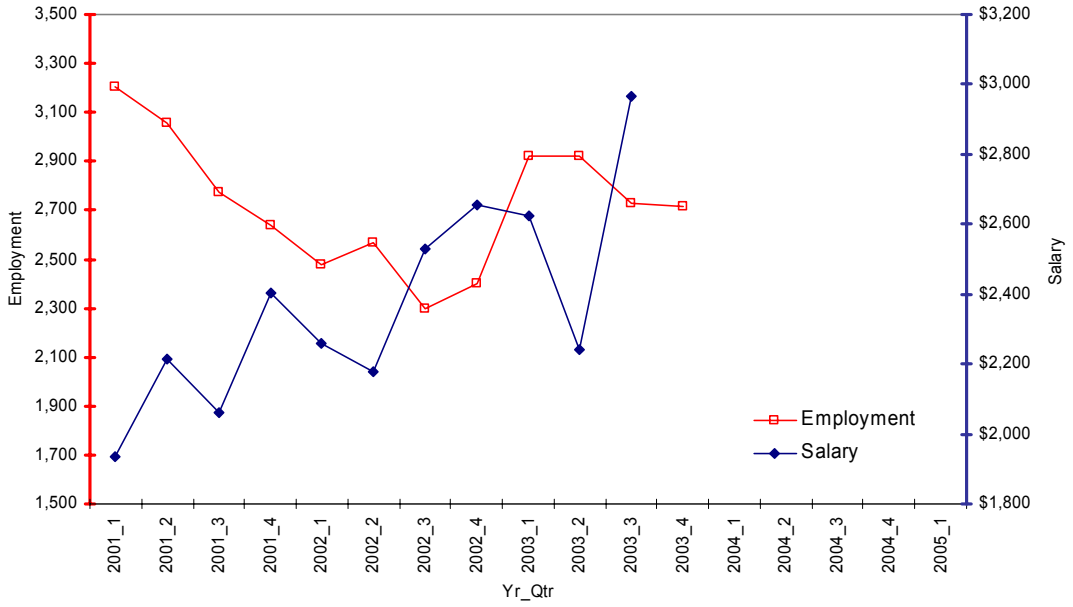
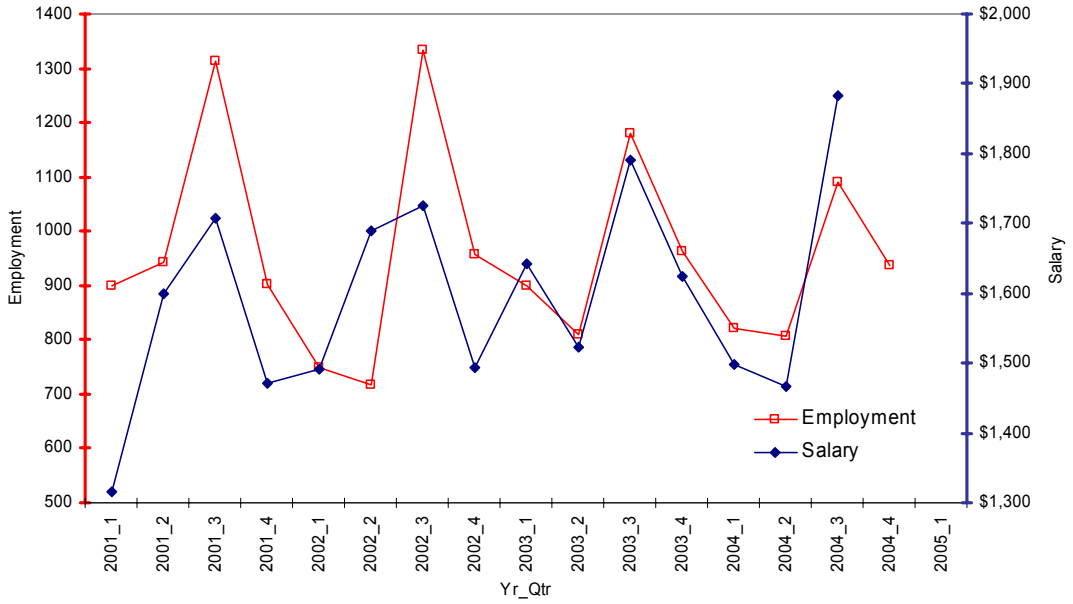


**Figure A.1-9. Quarterly seafood processing employment and salaries by state (2001-2005)**

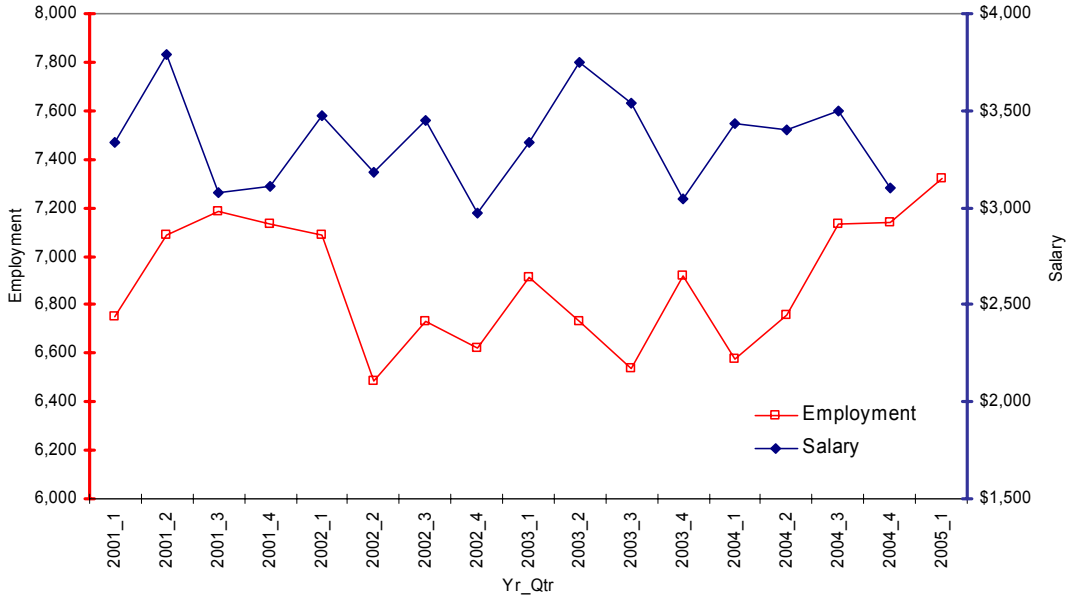
**a) California**




**b) Oregon**



**c) Washington**

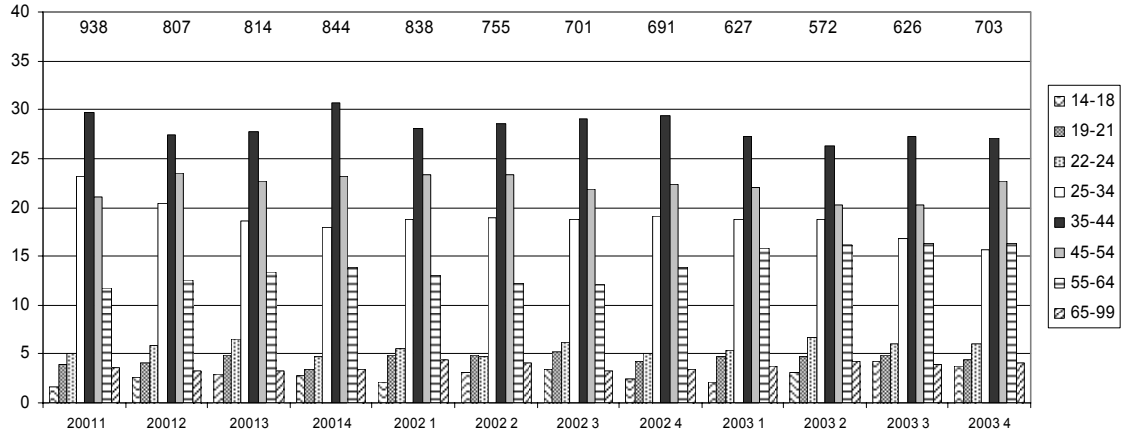



Age distribution among employees.

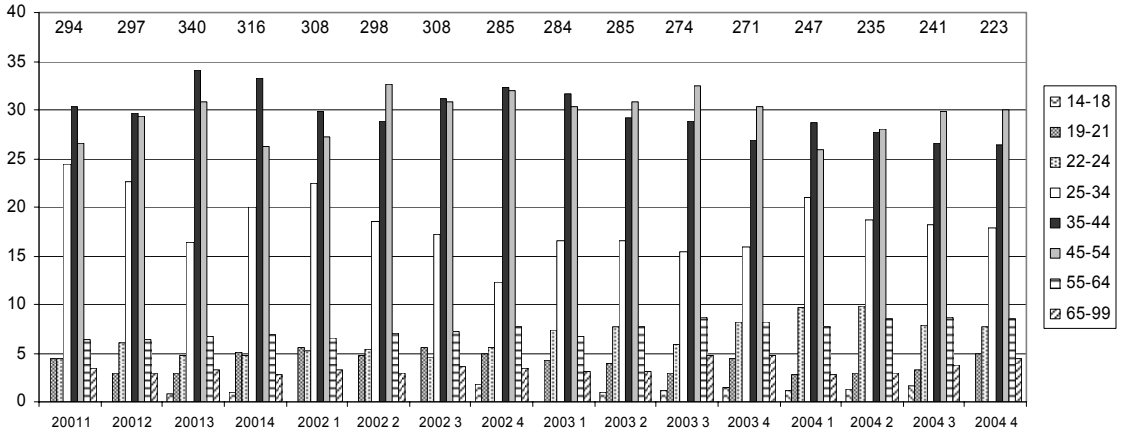
For both industries, the 35-44 age group is the predominant workforce in all three states with a 30-35 % (Figures A.1-10 and A.1-11). It is followed by the 45-54 age group with the exception of the state of Washington where the 24-25 group is the second highest.

**Figure A.1-10. Age distribution (%) among employees in the fishing related industry (2001-2005)**

**a) California**



**b) Oregon**




**c) Washington**

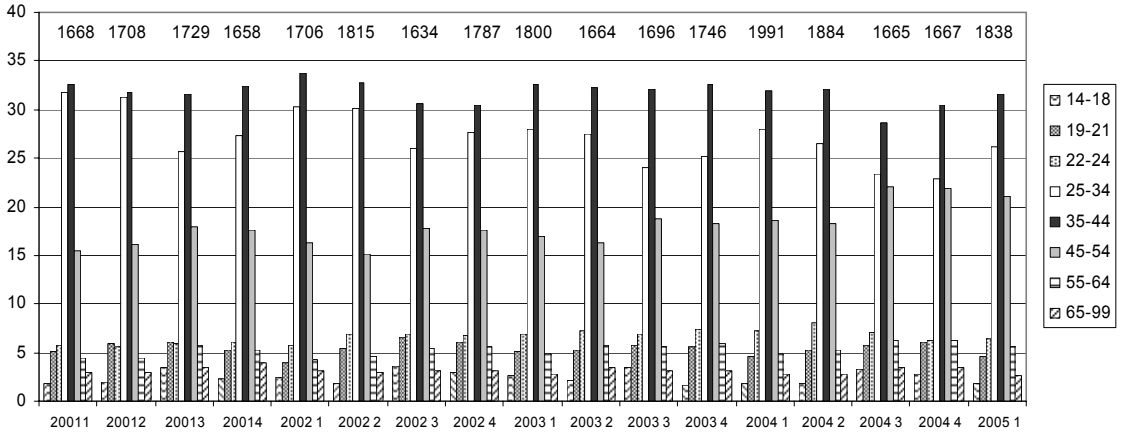
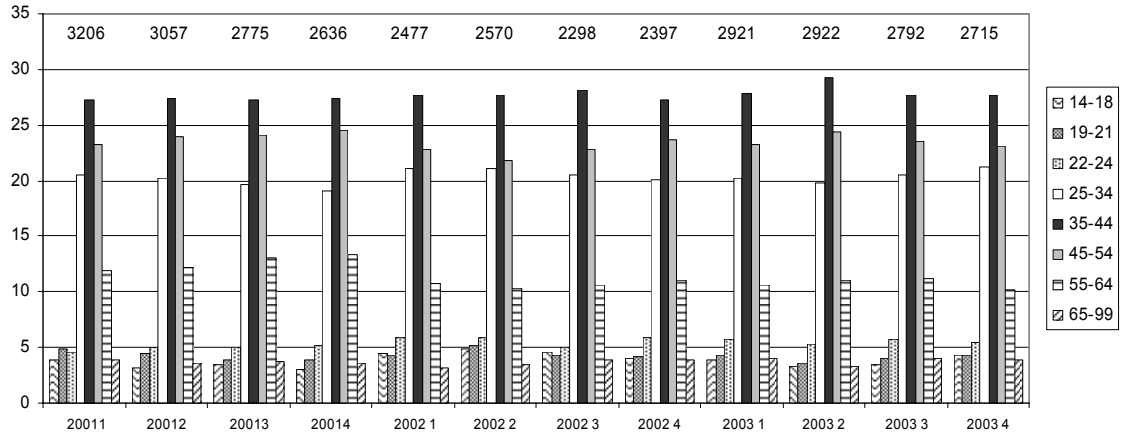
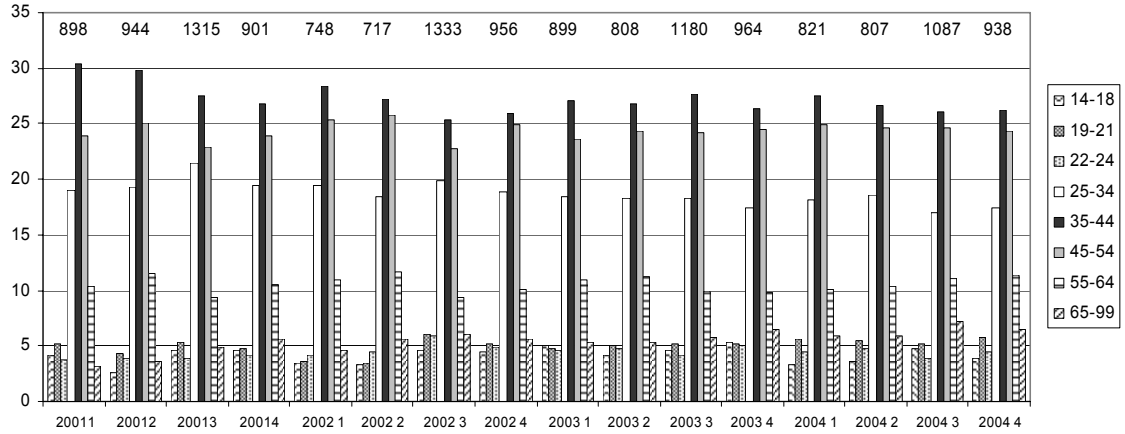


**Figure A.1-11. Age distribution (%) among employees in the seafood processing related industry (2001-2005)**

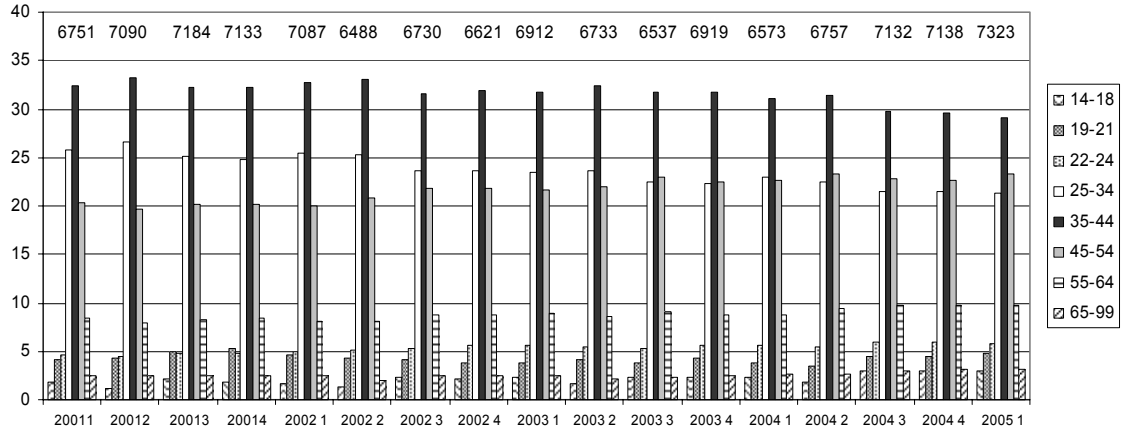
**a) California**




**b) Oregon**




**c) Washington**



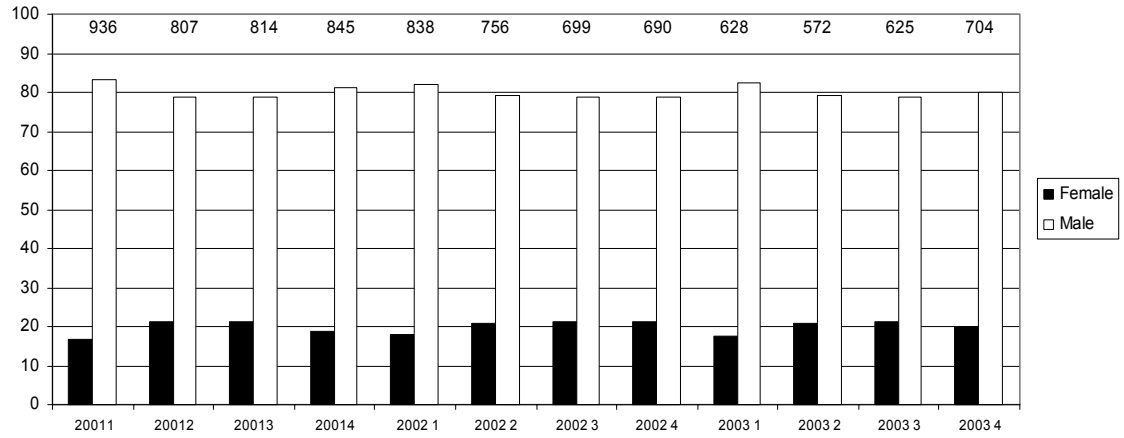
## Gender distribution

Male employees accounts for about 80 % of the workforce in the fishing industry for all three states (Figure A.1-12). California is the only state with quarters in which the female population overpasses the 20 % mark without an apparent discrimination between high or low employment periods.

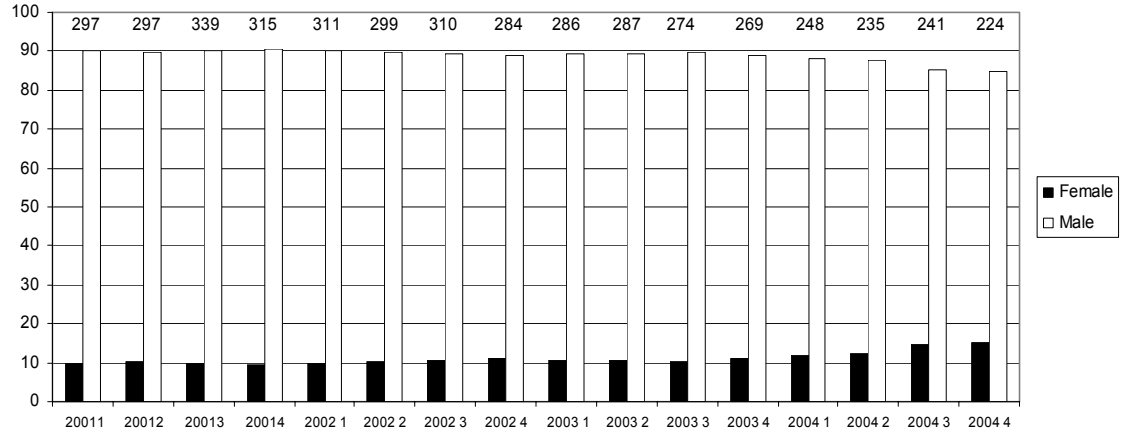
In the case of the seafood processing sector the distribution varies according to the state. In California there are more female workers in an almost a 50-50 distribution (Figure A.1-13a). Nevertheless, in Oregon and Washington the majority corresponds to male workers (60 and 70 % respectively).

**Figure A.1-12. Gender distribution (%) among employees in the fishing related industry (2001-2005)**

**a) California**




**b) Oregon**



**c) Washington**

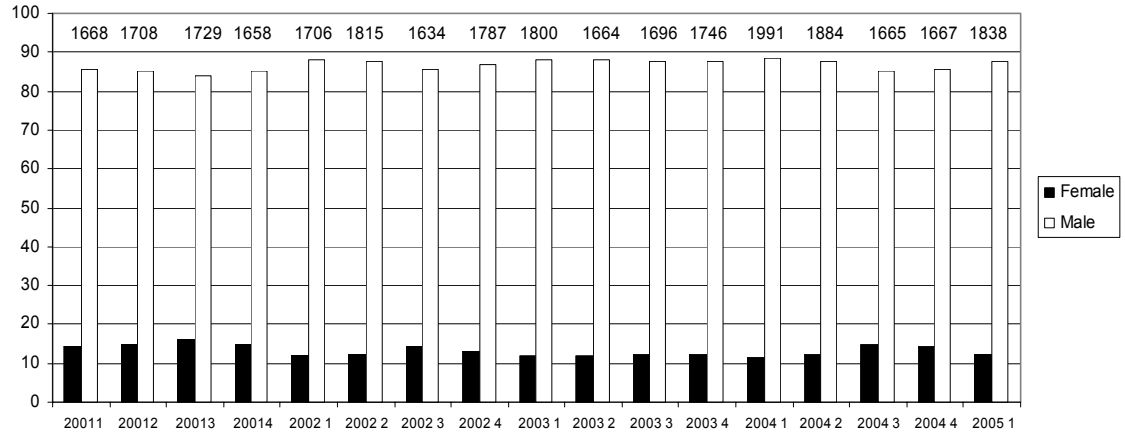
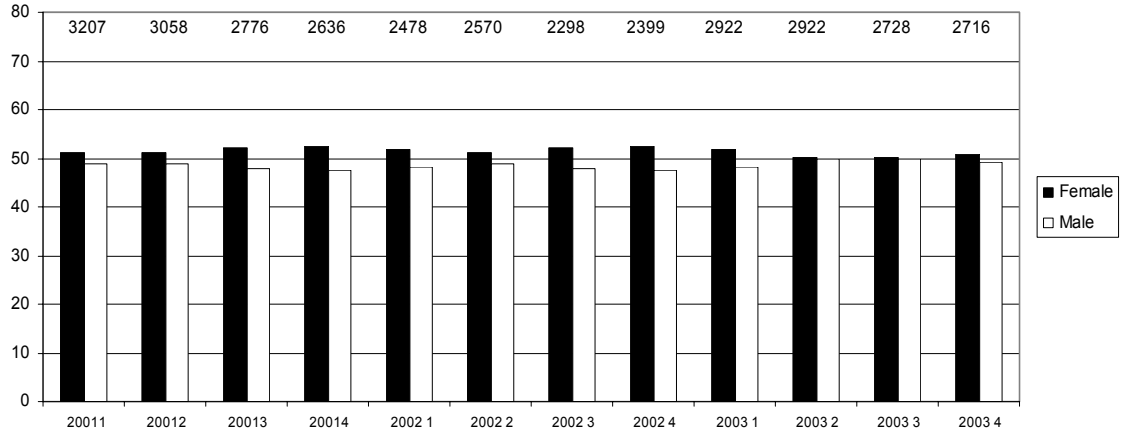
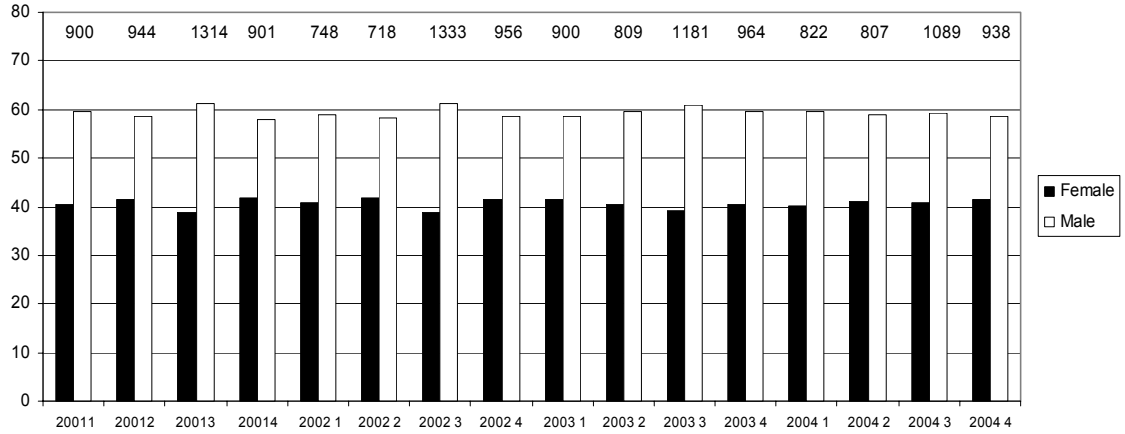



**Figure A.1-13. Gender distribution (%) among employees in the seafood processing related industry (2001-2005)**

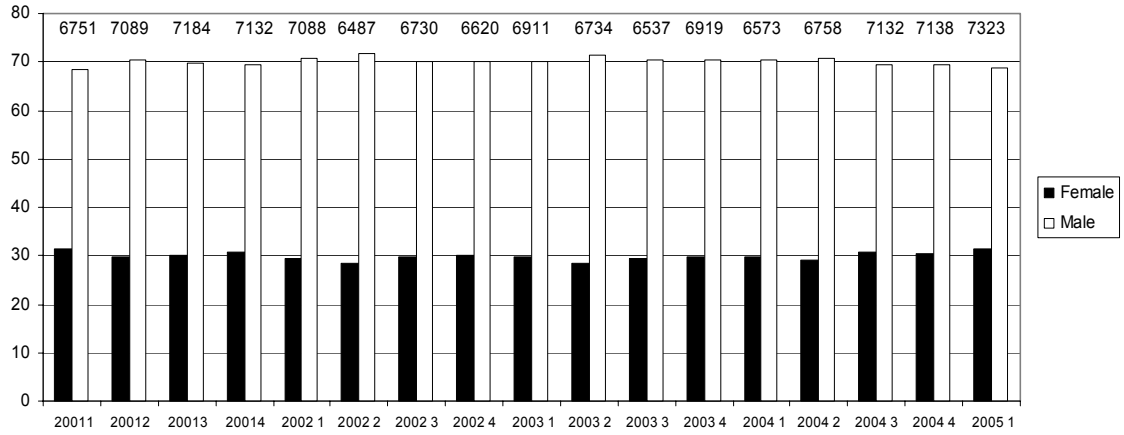
**a) California**




**b) Oregon**



**c) Washington**




### *A.1.4. Future steps*

The information presented in this report is not intended to produce any major conclusions. It is more an illustration of the steps that we are following to address the socio-economic issues involving fishing communities in the west coast. We are currently processing more information at the county and community level; however the data does not always have the same level of resolution that is required. Sometimes socio-economics indicators only reach the county level, leaving communities without a closer look.

At the same time the information gathered on employment combined with other demographic, social and economic data will allow us to develop the dependency analysis on fishing related industries by the communities, as well as to evaluate their resiliency.

## A.2 Economic Revenue and Distributional Impacts Associated with Overfished Species Management in West Coast Commercial Groundfish Fisheries

### *A.2.1 Introduction*

The management of West Coast groundfish fisheries is heavily centered on the need to rebuild seven overfished groundfish species. A species is considered overfished when its biomass is below 25% of estimated unfished biomass level. West Coast groundfish stocks are highly inter-mixed, meaning that overfished species co-occur and are caught in common with more abundant groundfish stocks. This inter-mixed nature of groundfish stocks means that eliminating the directed targeting of overfished species usually does not achieve the catch reductions needed to meet rebuilding goals. To adequately constrain total catch of overfished species, management must also constrain targeted fishing on healthy stocks that co-occur with overfished species in order to reduce incidental overfished species catch. This need to constrain harvest of healthy stocks has economic implications to sectors and communities engaged in fish harvesting and processing, because of the loss in landings and revenue that could have been derived from both overfished species and many target species that co-occur with those overfished species.

According to the Magnuson-Stevens Fishery Conservation and Management Act, when a fishery is overfished, any fishery management plan, amendment, or proposed regulations shall:

*A) specify a time period for ending overfishing and rebuilding the fishery that shall—*

*i) be as short as possible, taking into account the status and biology of any overfished stocks of fish, the needs of fishing communities, recommendations by international organizations in which the United States participates, and the interaction of the overfished stock of fish within the marine ecosystem; and*

*ii) not exceed 10 years, except in cases where the biology of the stock of fish, other environmental conditions, or management measures under an international agreement in which the United States participates dictate otherwise;*

*B) allocate both overfishing restrictions and recovery benefits fairly and equitably among sectors of the fishery*

The MSA defines a fishing community as a "community which is substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community." Social scientists and economists have struggled to come to a resolution with this definition of fishing community. Several perspectives have been proposed to identify fishing communities and include, for example: a collective fishing sector such as the "West Coast bottom trawl community", a geographic port of landing such as "the community of Astoria, Oregon," or a neighborhood within a large city such as the "Ballard fishing community" of Seattle, Washington where multiple fishing families have lived for generations. In the end, it may be worthwhile to consider any of the above possibilities when "taking into account…the needs of fishing communities."

The analysis in this document is provided with the intention that it can be used to consider both the needs of fishing communities, and the fair and equitable distribution of overfishing and recovery benefits (FMP Objective #13). Analyses in this document include: an analysis of changes in commercial fishery sector specific revenues associated with reductions in the mortality of overfished species, an identification of sectors most likely to be affected by management designed to reduce mortality of overfished species – the assumption being that those sectors with the highest impact of overfished species are more likely to be constrained by management designed to achieve reductions in overfished species mortality, and an

identification of ports affected by management designed to achieve reductions in overfished species mortality.

### *A.2.2 Approach*

The Pacific Fishery Management Council's Groundfish Management Team (GMT) has developed several models for estimating the catch of overfished species in commercial groundfish fisheries. These models have used data from the West Coast Groundfish Observer Program, state fish ticket programs, and state logbook programs to estimate the correlation in catch of target species and overfished species that occur on depth and latitudinal bases. The NMFS Northwest Regional Office augmented these models with economic data to directly compare exvessel revenue and overfished species mortality. NMFS ran several simulations with these models to develop an exvessel revenue – overfished species mortality relationship. The assumption in this approach was to keep exvessel revenue at the highest possible level given a set of area closures and the relative price per pound of target species. In the case of a fishery with multiple targets, such as the nearshore fixed gear groundfish fishery, or the bottom trawl groundfish fishery, reductions in the allowable take of target species were prioritized toward target species with the lowest price per pound. Taking this approach assures that vessels are more able to continue prosecuting high value target species, while achieving reductions in the take of overfished species with reductions in the targeting of less valuable species. In the case of a fishery with a single target such as the Pacific whiting or fixed gear sablefish fisheries, a reduction in the mortality of overfished species is directly proportional to the catch of target species, and (if one assumes a constant price per pound), directly proportional to reductions in exvessel revenue.

To identify likely distributional affects of reductions in overfished species mortality, we (NMFS Northwest Region working with members of the GMT) constructed a relational database. This database used available data on the interaction of fishery sectors with overfished species, and historical management actions that have been taken to achieve management targets of overfished species. We also used information from the 2005 groundfish stock assessments to identify the distributional range of various overfished species, and then analyzed it in conjunction with the size of fishing sectors on a regional basis. The resulting combined effect of relative stock size and relative fleet size helps identify the risk that a regional component of a fishing sector poses to a stock of an overfished species. In this case, "risk" is the potential catch that a particular regional sector has the potential to attain relative to the OY and relative to the capability of other sectors operating in the same area. Using this information on the relationship of groundfish stock and fleet sizes, we constructed a data set that identifies sectors that have high, med-high, med-low, and low or no impact on each overfished species, within a coastwide series of latitude-bounded management areas. Fishing sectors that were analyzed include:

1. limited entry bottom trawl – deep;
2. limited entry bottom trawl –shelf;
3. limited entry midwater trawl – Pacific whiting;
4. limited entry fixed gear – sablefish;
5. limited entry fixed gear – nearshore;
6. limited entry fixed gear – dogfish;
7. open access fixed gear – sablefish;
8. open access fixed gear – nearshore; and
9. open access fixed gear – dogfish.

Although other commercial sectors arguably exist, one can reasonably assume that these other sectors are minor compared to those listed, or can be considered a component of one of those sectors listed. Our data set further divided sectors by coastal management area where different overfished species commonly occur: north of 40˚ 10' N. lat., between 40˚ 10' N. lat. and 38˚ N. lat., between 38˚ N. lat. and 36˚ N. lat., and south of 36˚ N. lat.. The area north of 40˚ 10' N. lat. is a traditional area used for management of

commercial fisheries and tends to have the highest degree of impact for several overfished species, including darkblotched rockfish, yelloweye rockfish, and Pacific ocean perch. In the area between 38˚ N. lat. and 40˚ 10' N. lat., darkblotched rockfish populations are more moderate, Pacific ocean perch is nearly non-existent, and the area, and the northern portion the assessed portion of bocaccio rockfish begins. The area south of 38˚ N. lat. and north of 36˚ N. lat. contains few, if any, of the more northern overfished species such as darkblotched rockfish, but canary rockfish still tend to be caught in the area, as well as more southern oriented stocks such as bocaccio rockfish. Few canary rockfish occur south of 36˚ N. lat., but this area contains both bocaccio rockfish and cowcod.

Information from the Pacific Coast Fisheries Information Network (PacFIN) was used to identify vessels that participate in each of the sectors, and a principal port for those vessels was also identified. Vessels were assumed to participate in a sector based on a filter of specific gear type, and if 50 percent of landings for that vessel occurred at any time over the past 4 years, though in the case of the LE trawl sector only 2004 and 2005 were used because that sector has changed substantially since the 2003 buyback program. The methods used to identify sectors in this case are the same methods used to identify historic catch by sector for the November 2005 Groundfish Allocation Committee meeting. The end result is a list of sectors and ports that are likely to be affected at some level based on the assumption that relatively high impact fisheries are likely to be most constrained to achieve reductions in overfished species mortality.

### *A.2.3 Exvessel Revenue – Overfished Species Catch Tradeoffs in Commercial Fisheries*

This section presents the result of analysis displaying the tradeoff between the catch of overfished species and exvessel revenue of individual fishery sectors. In this case, catch of overfished species is defined as landings plus discard. In general, this analysis shows that reductions in the catch of overfished species become increasingly more costly in a sector with multiple targets, whereas reductions in the catch of overfished species in a single target sector is proportional to changes in exvessel revenue.

The analyses presented in this section are two-dimensional. That is, these analyses examine the relationship between exvessel revenue and overfished species catch by analyzing the relationship between catch of target species and catch of overfished species. These relationships will change as area management changes; however, for this analysis, area management is assumed to be constant.

#### A.2.3.1 Revenue – Overfished Species Catch Tradeoffs in the Pacific Whiting Fishery

The Pacific whiting fishery is a single target sector. Often the catches of overfished species in this sector are characterized by a random disaster tow where large amounts of overfished species are caught in a single tow of a trawl net. However, in more recent years the total annual catch of overfished species in this sector has become roughly proportional to the size of the Pacific whiting catch, though large random catches of overfished species still occasionally occur. Although random disaster tows still occur, for general diagnostic purposes, it is reasonable to analyze changes in the catch of overfished species mortality as being proportional to exvessel revenue to the Pacific whiting sector, while realizing that variability in the proportions (and therefore predicted relationships) will and do occur.

Figure A.2-1 shows the relationship between exvessel revenue and overfished species caught in the Pacific whiting fishery. From this figure it is evident that widow rockfish is the predominant overfished species caught in this sector, and that a reduction in the catch of widow that is on the order of 25 metric tons without area-based management would correspond to a reduction in Pacific whiting revenues of $5.8 million. Because the catch of overfished species is predicted to be proportional to the catch of Pacific

whiting, reductions in the metric tonnage catch of widow rockfish appear to be less costly per ton than reductions in the metric tonnage catch of other overfished species.

**Figure A.2-1. Exvessel Revenue vs Projected Overfished Species Catch in the Whiting Fishery**

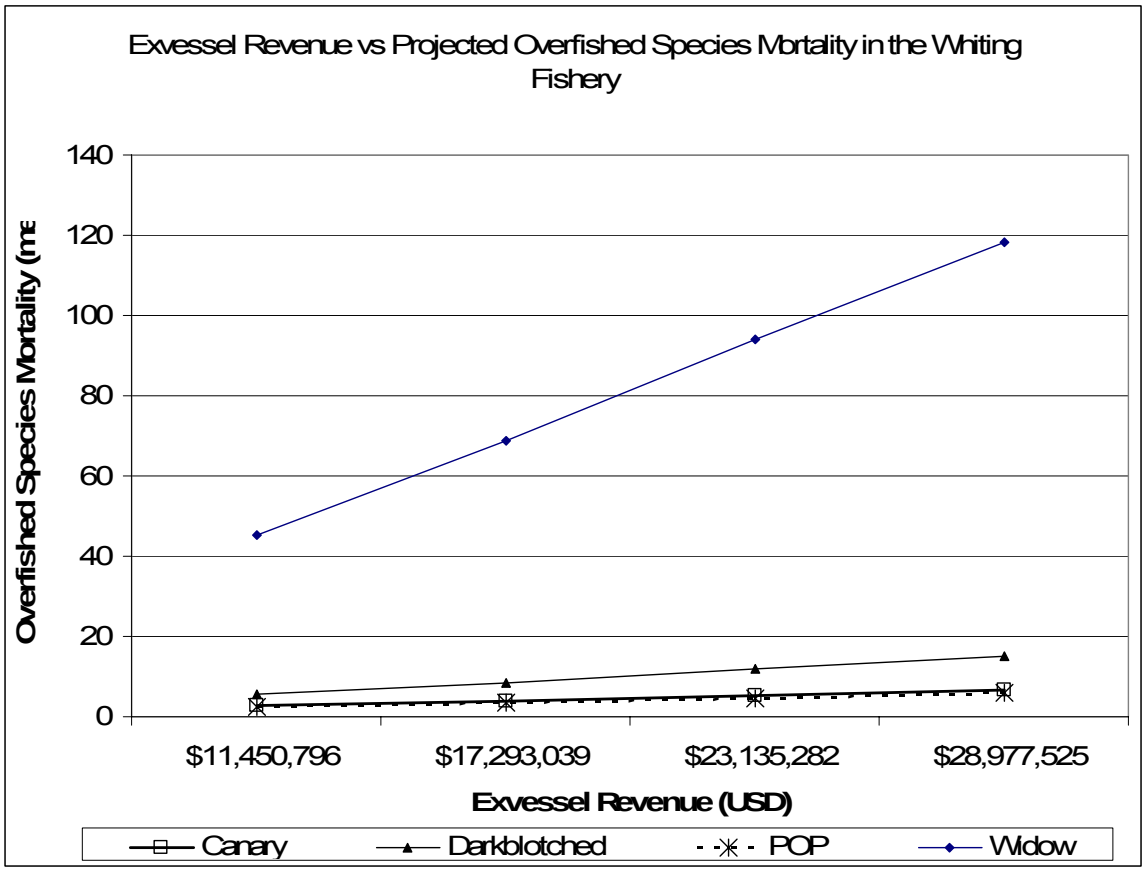
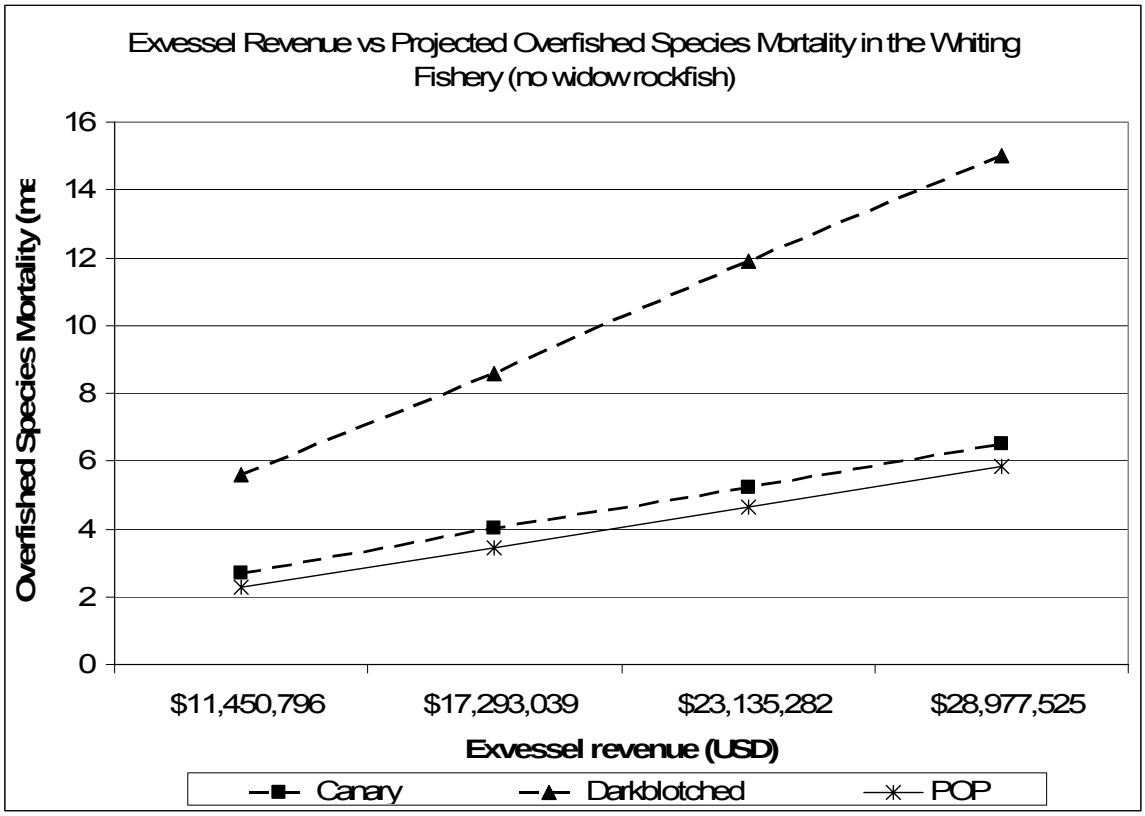



Figure A.2-2 provides a better perspective on the relationship between overfished species other than widow rockfish and exvessel whiting fishery revenue. This figure shows the relationship between darkblotched rockfish, POP, and canary rockfish and exvessel revenue in the whiting fishery. From this figure, it is evident that darkblotched rockfish is predicted to be the second highest component of overfished species catch, followed by canary and POP respectively, and that a reduction in the catch of darkblotched rockfish that is on the order of 3 metric tons would correspond to a reduction in Pacific whiting revenues of $5.8 million.

**Figure A.2-2 Exvessel Revenue vs Projected Overfished Species Catch in the Whiting Fishery (no widow rockfish)**

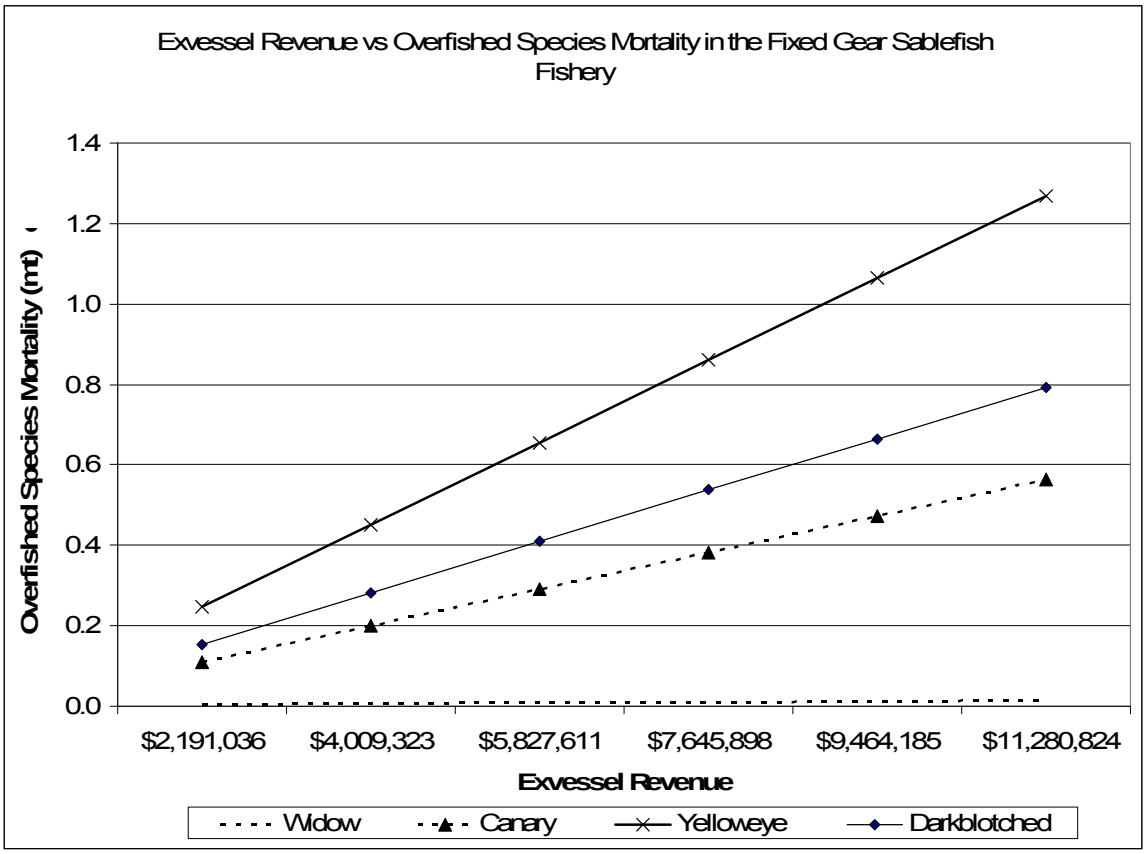



### A.2.3.2 Revenue – Overfished Species Catch Tradeoffs in the Fixed Gear Sablefish Fishery

Like the Pacific whiting fishery, the fixed gear sablefish fishery is a single target fishery. This sector is comprised of both open access and limited entry components, but both components are subject to the same area-based management, and therefore, the catch rate of overfished species in each component is assumed to be the same. While trawl fisheries are prone to "disaster tow" events where large quantities of overfished species can be caught in a single tow, fixed gear fisheries are typically not characterized by disaster-type catch events of the same degree. This means that it is likely the variability in the assumed proportion of overfished species to sablefish catch is small from year to year relative to trawl fisheries.

Figure A.2-3 shows the predicted relationship between overfished species mortality and exvessel revenue. Based on these predictions, yelloweye rockfish is the largest component of overfished species mortality in this sector, and a reduction of approximately 0.2 metric tons of yelloweye rockfish in this sector would correspond to a reduction of approximately $1.8 million in exvessel revenues (holding area closures constant), while a reduction of 0.1 metric tons of darkblotched would correspond to a reduction of $1.8 million in exvessel revenue.

**Figure A.2-3 Exvessel Revenue vs Overfished Species Mortality in the Fixed Gear Sablefish Fishery**




### A.2.3.3 Revenue – Overfished Species Catch Tradeoffs in the Nearshore Open Access Groundfish Fishery

The nearshore open access fishery is a fishery that targets multiple species. Target species include shallow and deeper nearshore groundfish, cabezon, kelp greenling, black rockfish, and blue rockfish amongst others. Available data shows this fishery operates shallower than 50 fathoms, and primarily shallower than 20 fathoms. The targets in this fishery are often bound for different markets, and therefore have different prices per pound. In areas south of 40˚ 10' N. lat., the most valuable species are shallow nearshore rockfish, followed by cabezon, kelp greenling, and deeper nearshore rockfish, respectively. In areas north of 40˚ 10' N. lat., the most valuable species are "other minor nearshore rockfish" followed by kelp greenling, cabezon, black rockfish, and blue rockfish respectively. By prioritizing reductions in target species catch toward those species that are least valuable on a price per pound basis, reductions in the catch of overfished species can be achieved more cheaply than by reducing the catch of all target species on a proportional basis to achieve reductions in overfished species catch. To analyze reductions in overfished species catch, we prioritized those reductions toward the least valuable species, because vessels can alter their behavior to focus on or avoid different target species. This sector was analyzed as two components--north and south of 40˚ 10' N. lat. We analyzed these two areas separately because management objectives have historically differed in the two areas.

Figure A.2-4 shows the relationship between exvessel value and the mortality of canary rockfish in areas south of 40˚ 10' N. lat.. Based on West Coast groundfish observer data, canary rockfish is the only overfished species that is caught in this sector and region. The figure shows that a reduction in the catch

of canary rockfish from 0.33 metric tons to 0.07 metric tons would cost approximately $400,000 (holding area closures constant), while a reduction in the catch of canary rockfish from 0.07 metric tons to 0.01 metric tons would cost over $1 million. However, over a range of values (approximately $1.3 million to $800,000) there is little or no reduction in the catch of canary rockfish. This is because over this revenue range, the approach taken to reduce the catch of overfished species is mostly being attributed to reductions in the catch of cabezon. Based on the depth range where cabezon is primarily caught, there is very little incidental catch of canary rockfish, and discard survival is high relative to deeper depths. Therefore, reducing the allowable cabezon catch in the area south of 40˚ 10' N. lat. may not be necessary to achieve reductions in overfished species mortality.

**Figure A.2-4. Exvessel Revenue vs Canary Mortality in Southern Nearshore Open Access Fisheries**

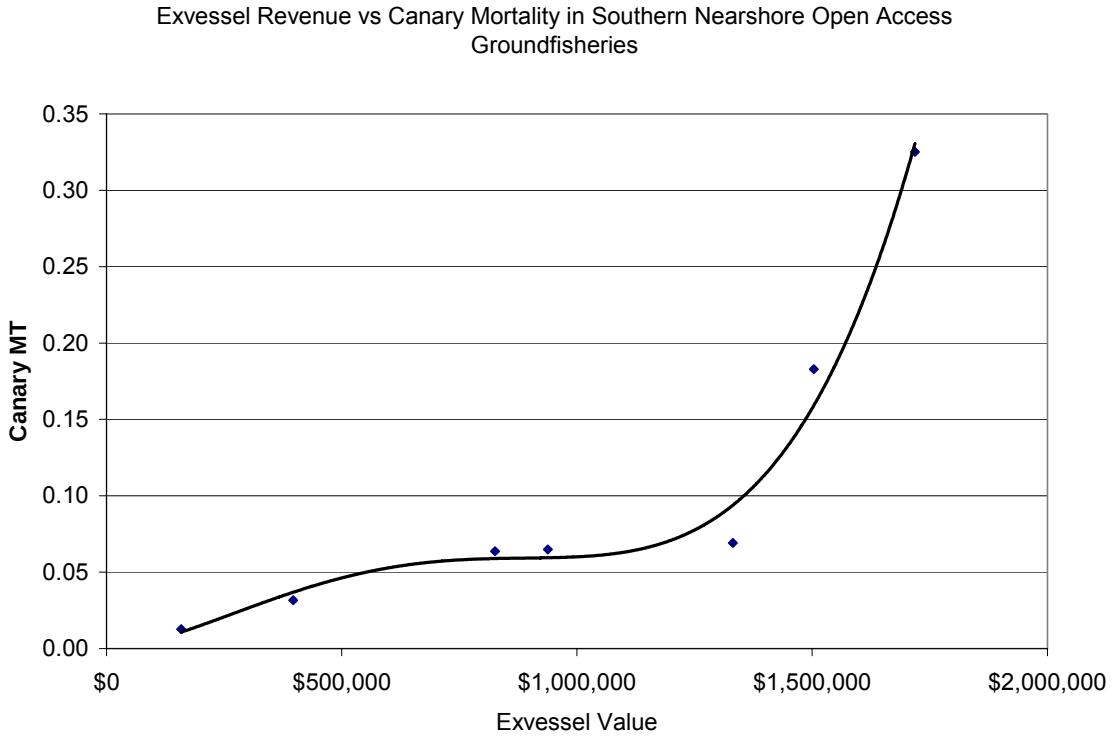
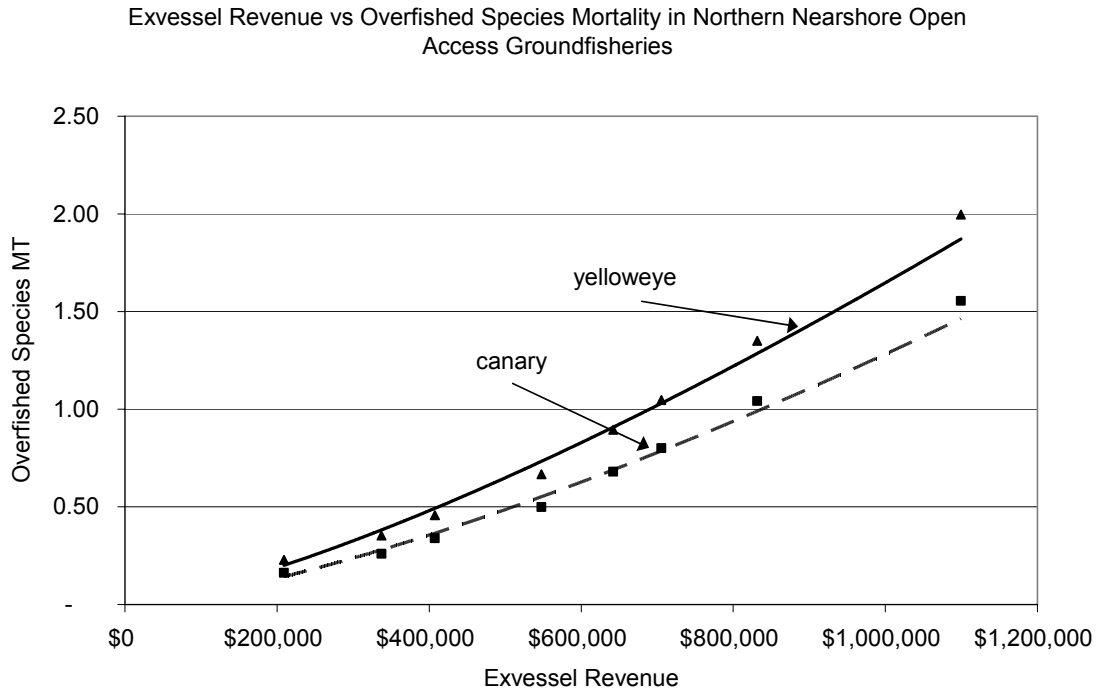



Figure A.2-5 shows the relationship between the catch of overfished species and exvessel revenue in areas north of 40˚ 10' N. lat. This figure shows that yelloweye rockfish is the most frequently caught overfished species, followed by canary rockfish, and–although not shown on the figure–there are also small amounts of widow rockfish caught in the fishery. Information shown in this figure suggests that a reduction of yelloweye catch from 1.9 metric tons to 1 metric ton while holding area closures constant would decrease exvessel revenue by $400,000, while a reduction from 1 metric ton to 0.25 metric tons would decrease exvessel revenue by $500,000. A reduction in the catch of canary from 1.5 metric tons to 0.75 metric tons would decrease revenues by $400,000, and a reduction in the catch of canary from 0.75 metric tons to 0.25 metric tons would decrease exvessel revenues by approximately $500,000.

**Figure A.2-5. Exvessel Revenue vs Overfished Species Mortality in Northern Nearshore Open Access Fisheries**




### A.2.3.4 Revenue – Overfished Species Catch Tradeoffs in the Limited Entry Bottom Trawl Fishery

The limited entry bottom trawl fishery is a fishery that targets multiple species that include Dover sole, thornyheads, sablefish, petrale sole, arrowtooth flounder, Pacific sanddabs, and English sole, amongst others. This fishery operates on both the continental shelf and continental slope, and therefore has a relatively large impact on several overfished species including bocaccio rockfish, canary rockfish, darkblotched rockfish, cowcod, and Pacific ocean perch. The targets in this fishery all have a different price per pound. Typically sablefish and petrale sole have been the most valuable species on a price per pound basis, while arrowtooth has the lowest price per pound. Dover sole, Pacific sanddabs, English sole, and other types of flatfish tend to have a more moderate price per pound with Dover sole traditionally being one of the more valuable flatfish species.

The curves shown in this section are developed by taking the approach of reducing the catch of less valuable species (arrowtooth) first, and reducing the catch of the most valuable species (sablefish and petrale sole) last while attempting to maintain the same level of annual catch opportunity for target species both north and south. This approach assumes that vessels can alter their behavior to focus on or avoid different target species. For example, a reduction in the trip limit for the "other flatfish" complex in the northern areas is accompanied by an equivalent reduction in the southern areas. The effect of this approach is that it becomes increasingly more costly to reduce the catch of overfished species in this sector.

Figure A.2-6 shows the relationship between the catch of canary rockfish and exvessel revenues in the LE bottom trawl fishery. Based on the curve that has been fitted to the various data points, reducing the catch of canary rockfish in this sector from 10 metric tons (a level comparable to 2005 estimated catch in this

sector) to 8 metric tons would reduce exvessel revenues by approximately $2 million, while a reduction from 4 metric tons to 2 metric tons would reduce revenues approximately $7 million meaning that initial reductions in the catch of canary rockfish are relatively inexpensive per metric ton compared the cost per metric ton of more dramatic reductions.

**Figure A.2-6 Exvessel Revenue vs Canary Mortality in the LE Bottom Trawl Sector**

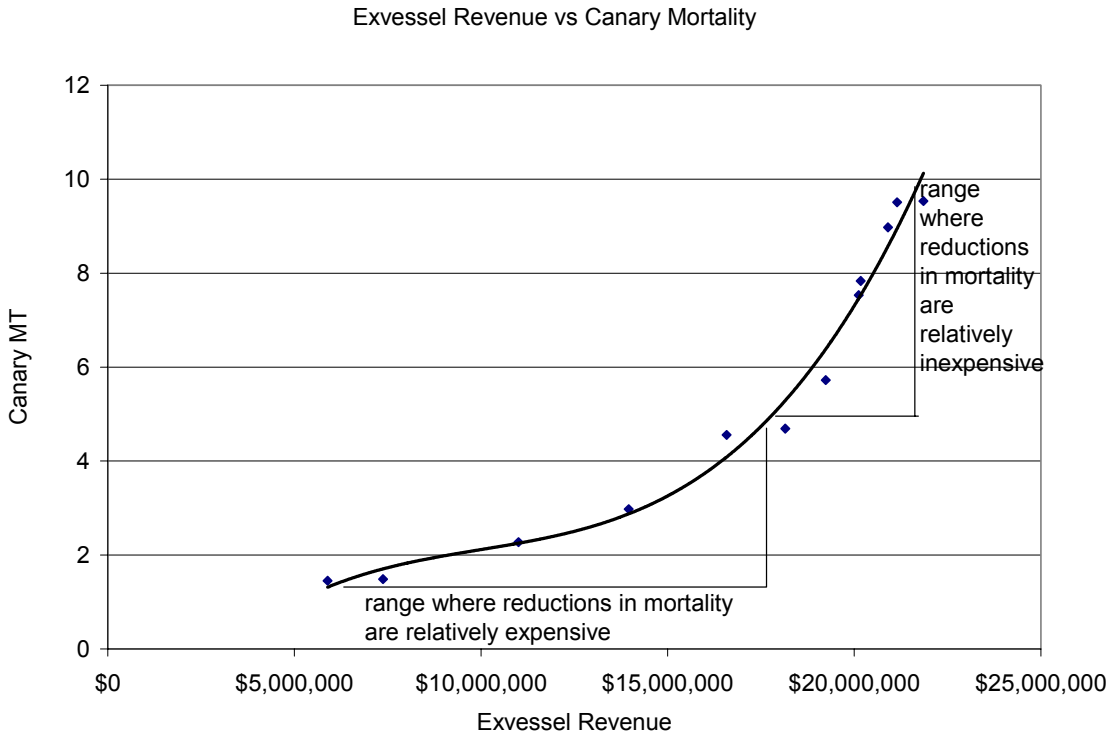
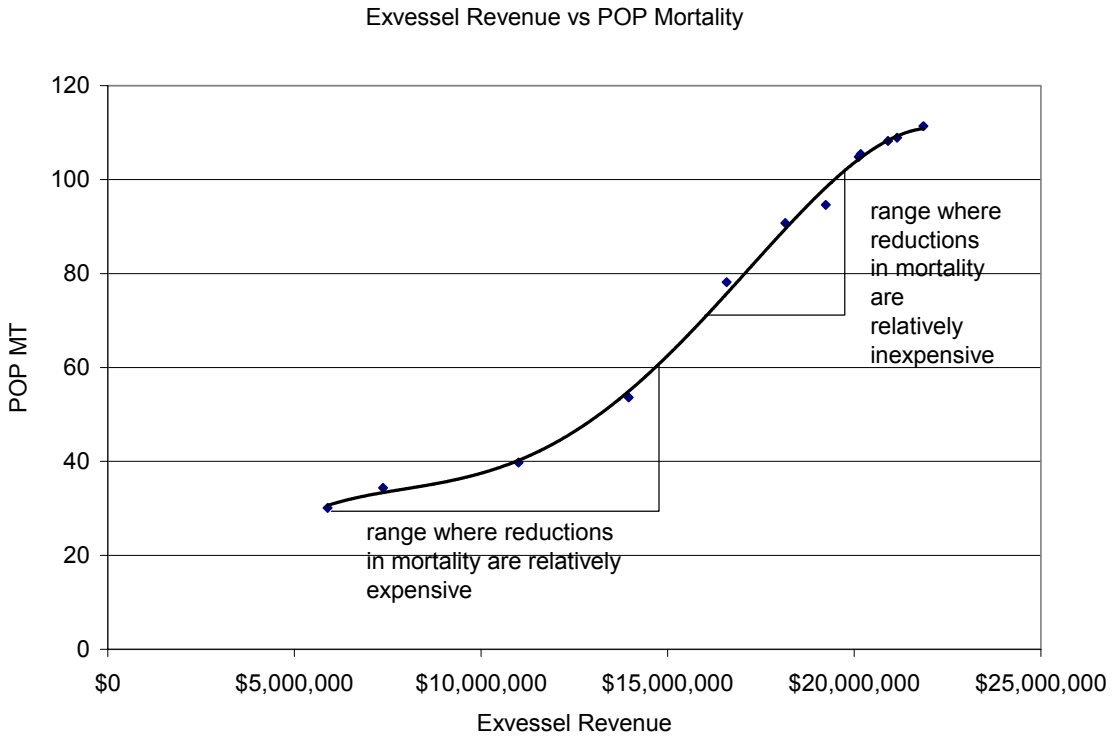



Figure A.2-7 shows the relationship between Pacific ocean perch and exvessel revenues. According to Figure A.2-7, reducing the catch of Pacific ocean perch in the bottom trawl sector from 100 metric tons to 80 metric tons would decrease revenues by approximately $3 million, while a reduction from 45 metric tons to 25 metric tons would decrease revenues by approximately $7 million. This shows that initial reductions in the catch of Pacific ocean perch in the bottom trawl fishery are relatively inexpensive per metric ton compared to the cost per metric ton of more dramatic reductions.

Also shown in the relationship between exvessel revenue and the catch of Pacific ocean perch is that the initial reductions in the catch of low valued species have little effect on the catch of Pacific ocean perch (the range of POP mortality corresponding to $20-$22 million). Since initial reductions in the allowable catch were targeted toward those species with a low price per pound (arrowtooth flounder), this means that the management of low valued species, such as arrowtooth flounder, have a relatively small impact on the catch of Pacific ocean perch compared to more moderately priced species such as Dover sole. Therefore, reductions in the mortality of Pacific ocean perch are likely to come from reductions in the targeting of more valuable species.

**Figure A.2-7. Exvessel Revenue vs Pacific Ocean Perch Mortality in the LE Bottom Trawl Sector**




In Figure A.2-8 the relationship between exvessel revenue and the mortality of darkblotched rockfish shows that reducing the catch of darkblotched rockfish from 140 metric tons to 120 metric tons would decrease revenues by approximately $2 million, while a reduction in the catch of darkblotched rockfish from 60 metric tons to 40 metric tons would decrease exvessel revenue by approximately $6 million. This shows that initial reductions in the catch of darkblotched rockfish in the bottom trawl fishery are relatively inexpensive per metric ton compared to the cost per metric ton of more dramatic reductions.

Like Pacific ocean perch, also shown in the relationship between exvessel revenue and the catch of darkblotched rockfish is that the initial reductions in the catch of low valued species have little effect on the catch of darkblotched (illustrated at the range of darkblotched mortality corresponding to $20-$22 million). Since initial reductions in the allowable catch were targeted toward those species with a low price per pound (arrowtooth flounder), this means that the management of arrowtooth flounder has a relatively small impact on the catch of darkblotched rockfish compared to more moderately priced species such as Dover sole, and reductions in darkblotched mortality are likely to correspond to reductions in the targeting of high valued species.

**Figure A.2-8 Exvessel Revenue vs Darkblotched Mortality in the LE Bottom Trawl Sector**

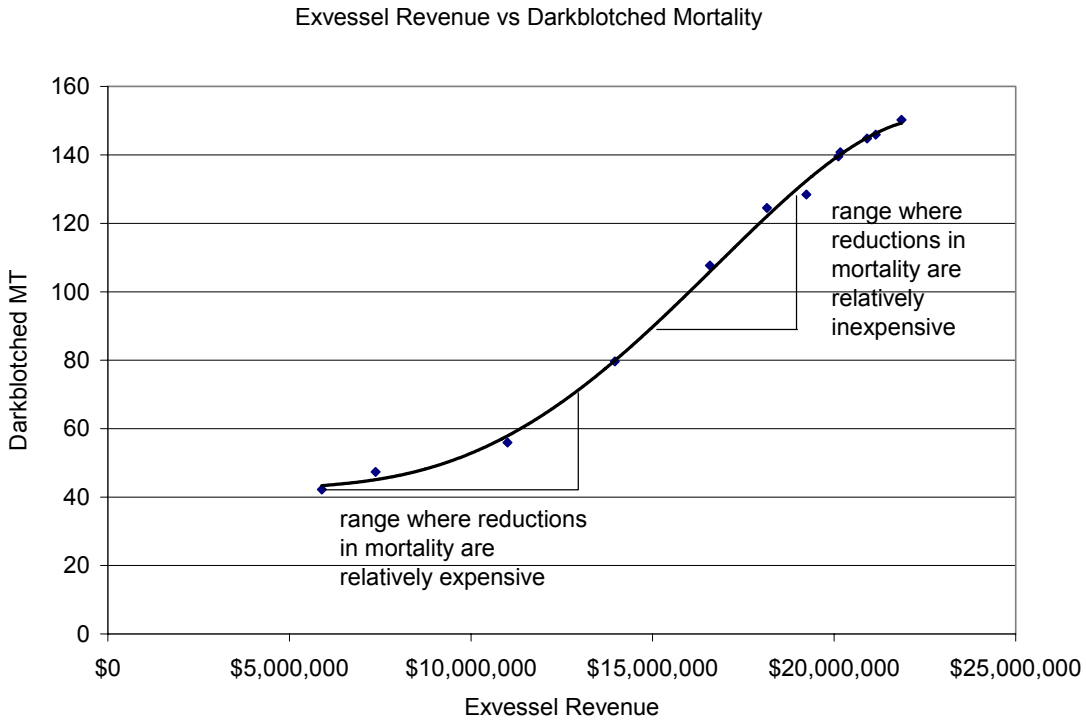



Figure A.2-9 shows the relationship between exvessel revenue and the catch of bocaccio rockfish. From this figure, reducing the catch of bocaccio rockfish from 45 metric tons to 25 metric tons would decrease exvessel revenues by approximately $2 million, while reducing the catch of bocaccio rockfish from 20 metric tons to 10 metric tons would decrease revenues by approximately $5 million. This shows that initial reductions in the catch of bocaccio rockfish in the bottom trawl fishery are relatively inexpensive per metric ton compared to the cost per metric ton of more dramatic reductions.

**Figure A.2-9. Exvessel Revenue vs Bocaccio Mortality in the LE Bottom Trawl Sector**

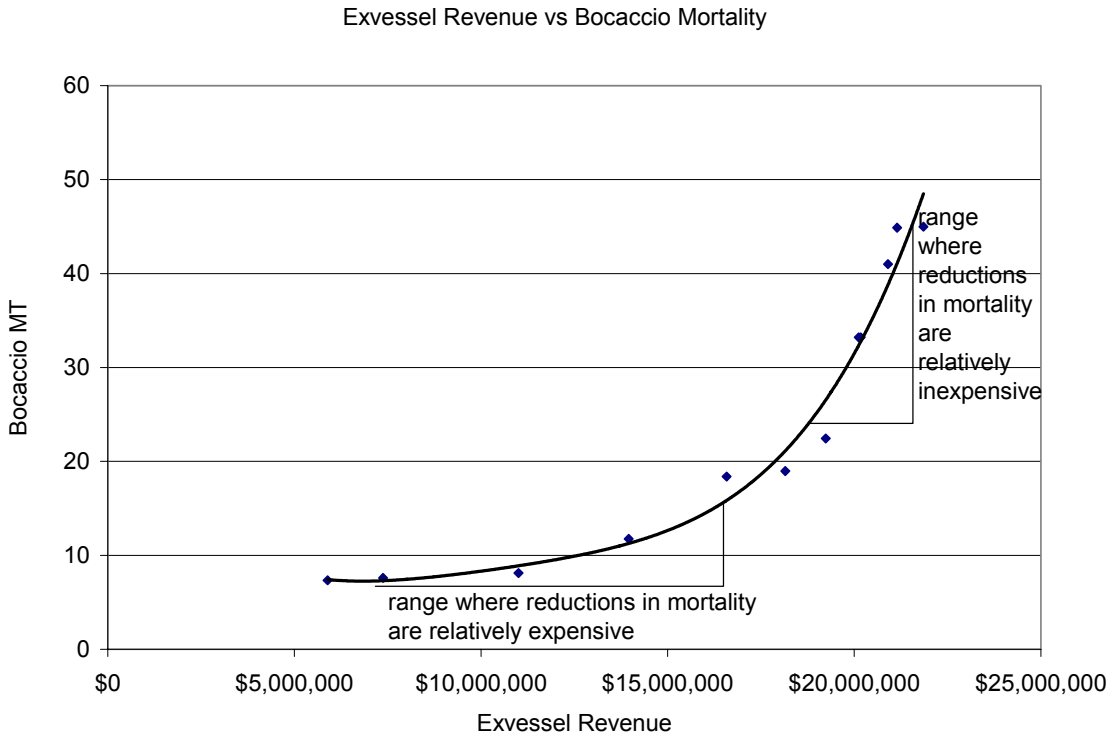



Figure A.2-10 shows the relationship between the catch of cowcod and exvessel revenue in the limited entry bottom trawl sector. This figure shows that reducing the catch of cowcod from 2 metric tons to 1.5 metric tons would decrease revenues by approximately $1 million, while reducing the catch of cowcod from 1 metric ton to 0.5 metric tons would decrease exvessel revenues by approximately $4 million.

**Figure A.2-10. Exvessel Revenue vs Cowcod Mortality in the LE Bottom Trawl Sector**

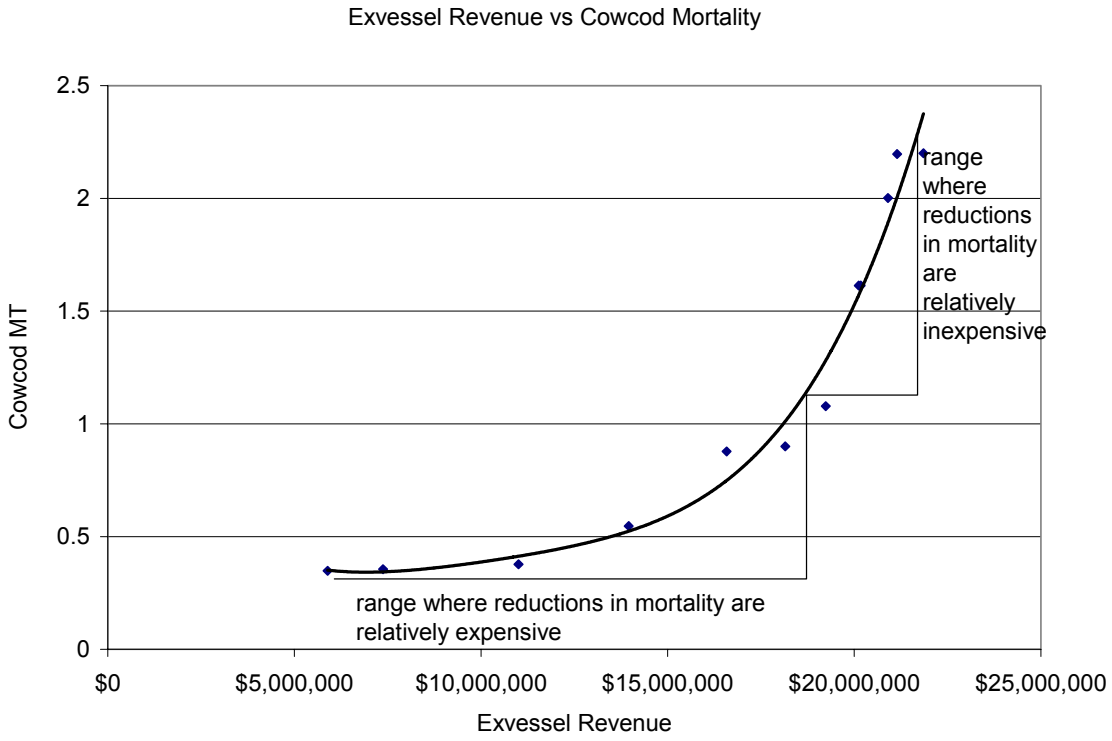
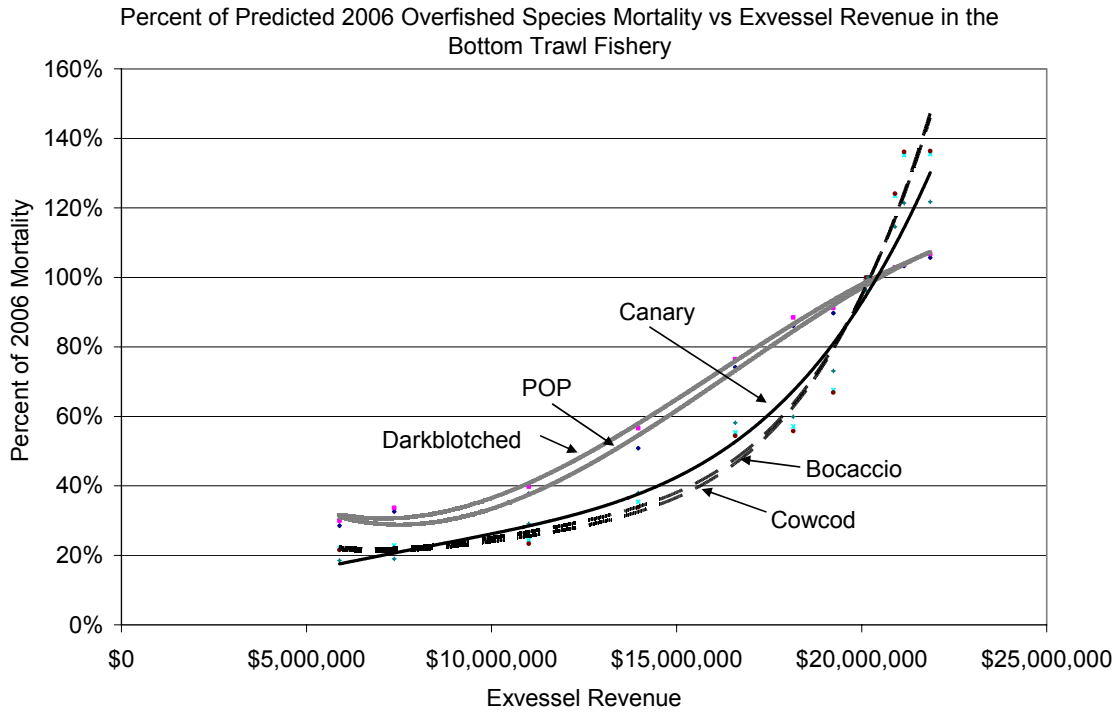



Figure A.2-11 plots the mortality of all overfished species (in percentage terms) against exvessel revenue. In this case, the mortality of overfished species is normalized by estimating it as a percentage of initially predicted mortality in the 2006 fishery. The 100 percent mark is equivalent to predicted 2006 mortality. The difference between Figure A.2-11 and other figures is that mortality is expressed on a percentage basis and compared to exvessel revenues, thus making changes in the mortality of overfished species more comparable.

Based on the information shown in Figure A.2-11, percent reductions in the catch of darkblotched rockfish and POP are generally more costly than percent reductions in the catch of bocaccio rockfish and cowcod, while percent reductions in the catch of canary rockfish can be considered more moderate. The reason percent reductions in the catch of darkblotched and POP are more expensive than bocaccio, canary, and cowcod is because darkblotched and POP are caught in deep areas where more valuable species tend to be caught. Bocaccio rockfish and cowcod are caught largely on the shelf where less valuable flatfish are typically found. Canary rockfish on the other hand are primarily caught in the shelf areas, but small amounts of canary are also caught in deeper areas, thus making the value of a percent change in the catch of canary in-between the values of darkblotched and POP, versus bocaccio and cowcod. It is important to note that while some overfished species are caught together, many are not. Therefore, the information shown in Figure A.2-11 should not be misinterpreted to mean that reductions in the mortality across multiple overfished species need to happen simultaneously.

**Figure A.2-11 Exvessel Revenue vs Mortality for All Overfished Species**




### *A.2.4 Distributional Impacts of Changes in Overfished Species Catch in Commercial Groundfish Fisheries*

The analyses provided in the previous sections showed that overfished species have differential exvessel revenue associations and impacts across sectors. Some overfished species are primarily caught in a single sector, while other overfished species may be caught in multiple sectors. The sector and geographic distribution of economic impacts resulting from management designed to protect overfished species can be substantially different for each overfished species due to the occurrence of certain species across sectors, the latitudinal existence of overfished species, and the degree to which various ports are involved in different fisheries, among other things. This section provides information on the identification of sectors, regions, and ports that are affected by overfished species management, and identifies the degree to which those sectors, regions, or ports are likely to be affected by management that is designed to reduce the catch of overfished species. The underlying assumption is that fisheries with high impacts to overfished species are most likely to be restricted to achieve catch reductions in those overfished species. This assumption is reasonable given the fact that past approaches to achieve such reductions have prioritized catch reductions toward sectors with the highest degree of impact.

For reference purposes, available data on the range of overfished species, historical catch, and current catch of overfished species was used to show where overfished species are found and where they are currently caught in commercial fisheries. Areas where there are minimal amounts of overfished species caught were included, though in the next sections of the document, minimal amounts of impact are left blank and identified as a low or no impact. The relevance of the information shown in Table A.2-1 and Table A.2-2 is that commercial groundfish fisheries operating in the listed latitudinal areas pose some potential risk to the overfished stock even if that risk is minimal.

**Table A.2-1. Range Where Overfished Species are Currently Caught in the Commercial Fishery**

| | OVERFISHED SPECIES | | | | | | |
|---|---|---|---|---|---|---|---|
| AREA | BOCACCIO | CANARY | COWCOD | DARKBLOTCHED | POP | WIDOW | YELLOWEYE |
| N 40 10 | | √ | | √ | √ | √ | √ |
| 38 – 40 10 | √ | √ | | √ | | √ | |
| 36 - 38 | √ | √ | √ | √ | | √ | |
| S 36 | √ | | √ | | | | |

1) although some of the species listed are caught outside the areas check-marked above, the check-mark only applies to the boundary where there is an ABC for these species
2) in some areas only minimal amounts of overfished species are currently caught. These areas are checked-marked

**Table A.2-2. Range Where Overfished Species are Potentially Caught in the Commercial Fishery**

| | OVERFISHED SPECIES | | | | | | |
|---|---|---|---|---|---|---|---|
| AREA | BOCACCIO | CANARY | COWCOD | DARKBLOTCHED | POP | WIDOW | YELLOWEYE |
| N 40 10 | | √ | | √ | √ | √ | √ |
| 38 – 40 10 | √ | √ | √ | √ | √ | √ | √ |
| 36 - 38 | √ | √ | √ | √ | | √ | √ |
| S 36 | √ | √ | √ | √ | | √ | |

1) although some of the species listed are caught outside the areas check-marked above, the check-mark only applies to the boundary where there is an ABC for these species
2) in some areas only minimal amounts of overfished species have historically been caught. These areas are checked-marked

The following tables separate fishing sectors on a latitudinal basis and by the degree of impact on overfished species. We characterize each sector's overfished species effects as having one of four different possible degrees-of-impact: high, medium-high (MH), medium-low (ML), and low or no impact. The degree of impact was assigned relative to the ABC, the 2006 OY, and the relative 2004 and 2005 catch of overfished species estimated to have been taken in each sector. Table A.2-3 shows the assigned level of impact criteria by region, sector, and overfished species. The criteria that were assigned are based partially on the catch of overfished species estimated to have been taken by sector in the 2004 and 2005 fisheries. If area boundaries and targeting opportunities were to be changed, these criteria may change as well. A blank cell means that sector has no, or low impact. While multiple cells are blank, it is important to note that does not necessarily mean a particular sector/area combination is ignored when it comes to reducing the catch of overfished species. In a relatively extreme case, sectors with a low impact may be constrained in addition to sectors with high, med-high, and med-low impacts. However, for the purposes of planning in the long term (one year or more), sectors with a low impact have not traditionally been subject to constraints to protect overfished species. Constraints on low impact fisheries have traditionally been limited to inseason actions.

**Table A.2-3. Level of Overfished Species Impact by Region and Groundfish Sector**

| | | OVERFISHED SPECIES | | | | | | |
|---|---|---|---|---|---|---|---|---|
| AREA | SECTOR | BCCCIO | CANARY | COWCD | D'BLTCH | POP | WIDOW | Y'EYE |
| N 40 10 | LE FG-DOGFISH | | ML | | | | | MH |
| | LE FG-NEARSHORE | | ML | | | | | MH |
| | LE FG-SABLEFISH | | ML | | | | | MH |
| | LE B-TRAWL-DEEP | | ML | | HIGH | HIGH | | |
| | LE B-TRAWL-SHELF | | HIGH | | | | | |
| | LE MW-TRAWL-WHITING | | HIGH | | ML | ML | HIGH | |
| | OA FG-DOGFISH | | ML | | | | | MH |
| | OA FG-NEARSHORE | | MH | | | | | MH |
| | OA FG-SABLEFISH | | ML | | | | | MH |
| 38 - 40 10 | LE FG-NEARSHORE | ML | ML | | | | | |
| | LE FG-SABLEFISH | ML | ML | | | | | |
| | LE B-TRAWL-DEEP | ML | ML | | MH | | | |
| | LE B-TRAWL-SHELF | HIGH | MH | | | | | |
| | OA FG-NEARSHORE | ML | ML | | | | | |
| | OA FG-SABLEFISH | ML | ML | | | | | |
| 36 - 38 | LE FG-NEARSHORE | ML | ML | ML | | | | |
| | LE FG-SABLEFISH | ML | ML | ML | | | | |
| | LE B-TRAWL-DEEP | ML | ML | | | | | |
| | LE B-TRAWL-SHELF | HIGH | ML | MH | | | | |
| | OA FG-NEARSHORE | ML | ML | ML | | | | |
| | OA FG-SABLEFISH | ML | ML | ML | | | | |
| S 36 | LE FG-NEARSHORE | ML | | ML | | | | |
| | LE FG-SABLEFISH | ML | | ML | | | | |
| | LE B-TRAWL-DEEP | ML | | | | | | |
| | LE B-TRAWL-SHELF | HIGH | | MH | | | | |
| | OA FG-NEARSHORE | ML | | ML | | | | |
| | OA FG-SABLEFISH | ML | | ML | | | | |

Table A.2-4 and Table A.2-5 show the relationship between fishery sectors and ports. In these tables, a check-mark identifies a port as being engaged in a particular sector. From this information it is apparent that the sablefish sectors are present in the largest number of ports, and the dogfish sectors are present in the fewest number of ports. What is not contained in this type of information is the scale and relative degree of dependence that each port has on the particular sectors that port is engaged in. However, if one defines a fishing community as a port, or as a port-sector combination, this information can be used to identify communities that are substantially engaged in commercial groundfish fisheries.

**Table A.2-4. Port Engagement in Groundfish Sectors in Areas North of 40 Degrees 10 Minutes Latitude**

| | | SECTOR | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| AREA | PORT | LE B-TRAWL-DEEP | LE B-TRAWL-SHELF | LE FG-DOGFISH | LE FG-NEARSHORE | LE FG-SABLEFISH | LE MW-TRAWL-WHITING | OA FG-DOGFISH | OA FG-NEARSHORE | OA FG-SABLEFISH |
| N 40 10 | ABERDEEN | | | | | | | | | √ |
| | ASTORIA | √ | √ | | √ | √ | √ | | | √ |
| | BANDON | | | | | | | | | √ |
| | BELLINGHAM BAY | √ | √ | √ | | √ | | √ | | √ |
| | BLAINE | √ | √ | √ | | √ | | | | |
| | BROOKINGS | √ | √ | | | √ | | | √ | √ |
| | CATHLAMET | | | | | √ | | | | |
| | CHARLESTON (COOS BAY) | √ | √ | | | √ | √ | | √ | √ |
| | CHINOOK | | | | | √ | | | | √ |
| | CRESCENT CITY | √ | √ | | √ | √ | √ | | √ | √ |
| | DEPOE BAY | | | | | | | | √ | |
| | EUREKA | √ | √ | | | √ | √ | | √ | √ |
| | EVERETT | | | | | √ | | | | |
| | FIELDS LANDING | | | | | | | | | √ |
| | FLORENCE | | | | | | | | | √ |
| | GARIBALDI (TILLAMOOK) | | | | | √ | | | √ | √ |
| | GOLD BEACH | | | | | | | | √ | |
| | ILWACO | | | | | √ | √ | | | √ |
| | LAPUSH | | | | | √ | | | | √ |
| | MILL CREEK | | | | | | | | √ | |
| | NEAH BAY | √ | √ | | | √ | | | | √ |
| | NEWPORT | √ | √ | | | √ | √ | | √ | √ |
| | PACIFIC CITY | | | | | | | | √ | |
| | PORT ANGELES | | | | | √ | | | | √ |
| | PORT ORFORD | | | | √ | √ | | | √ | √ |
| | PORT TOWNSEND | | | | | | | | | √ |
| | SEATTLE | | | | | | √ | | | √ |
| | TOKELAND | | | | | | | | | √ |
| | TRINIDAD | | | | | | | | √ | |
| | WESTPORT | √ | √ | | | √ | √ | | | √ |
| | WINCHESTER BAY | | | | | √ | | | | √ |

**Table A.2-5. Port Engagement in Groundfish Fisheries in Areas South of 40 Degrees 10 Minutes Latitude**

| | | SECTOR | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| AREA | PORT | LE B-TRAWL-DEEP | LE B-TRAWL-SHELF | LE FG-DOGFISH | LE FG-NEARSHORE | LE FG-SABLEFISH | LE MW-TRAWL-WHITING | OA FG-DOGFISH | OA FG-NEARSHORE | OA FG-SABLEFISH |
| 38 - 40 10 | ALBION | | | | | | | | √ | |
| | BODEGA BAY | | | | | √ | | | √ | |
| | FORT BRAGG | √ | √ | | | √ | | | √ | √ |
| | POINT ARENA | | | | | | | | √ | |
| | POINT REYES | | | | | | | | | √ |
| | SHELTER COVE | | | | | | | | √ | |
| 36 - 38 | BIG CREEK | | | | | | | | √ | |
| | BODEGA BAY | | | | | | | | | √ |
| | ELK | | | | | | | | | √ |
| | MONTEREY | √ | √ | | | √ | | | √ | √ |
| | MOSS LANDING | √ | √ | | | √ | | | √ | √ |
| | PRINCETON / HALF MOON BAY | √ | √ | | | √ | | | √ | √ |
| | SAN FRANCISCO | √ | √ | | √ | √ | | | √ | √ |
| | SANTA CRUZ | | | | | | | | √ | |
| | SANTA CRUZ | | | | | | | | | √ |
| S 36 | AVILA | | | | | √ | | | √ | |
| | BERKELEY | | | | | | | | √ | |
| | DANA POINT | | | | | √ | | | | |
| | LONG BEACH | | | | | √ | | | | |
| | MISSION BAY | | | | | √ | | | | √ |
| | MORRO BAY | √ | √ | | | √ | | | √ | √ |
| | NEWPORT BEACH | | | | | √ | | | | |
| | OCEANSIDE | | | | | √ | | | | √ |
| | OXNARD | | | | √ | √ | | | √ | √ |
| | PLAYA DEL REY | | | | | √ | | | | |
| | POINT LOMA | | | | | | | | | √ |
| | SAN DIEGO | | | | | | | | √ | √ |
| | SAN PEDRO | | | | | | | | √ | |
| | SAN SIMEON | | | | | | | | √ | |
| | SANTA BARBARA | | | | √ | | | | √ | |
| | TERMINAL ISLAND | | | | | √ | | | | √ |
| | VENTURA | | | | | | | | √ | √ |
| | WILMINGTON | | | | √ | | | | | |

Through the association of fishing sectors, management to achieve reductions in the catch of overfished species, and port of landing for vessels engaged in various fishing sectors, we can identify which ports would likely be affected by management designed to achieve reductions in the catch of certain overfished species. Table A.2-6 associates regional fishing sectors with greater than a "low/no" impact to identify ports potentially affected if reductions in the catch of overfished species are necessary. This information shows that canary rockfish would potentially affect the largest number of ports, followed by bocaccio, yelloweye, cowcod, darkblotched, POP, and widow rockfish respectively. This table also shows that many ports in the north are potentially affected by up to five overfished species, while ports in the south are affected by two or three overfished species. Individual overfished species also have different regional impacts. For example, while cowcod and bocaccio may not impact the largest number of ports, they potentially affect all commercial groundfish ports south of 38˚ N. latitude.

**Table A.2-6. Ports Potentially Impacted by Reductions in Overfished Species Catch**

| | | OVERFISHED SPECIES | | | | | | |
|---|---|---|---|---|---|---|---|---|
| AREA | PORT | BCACCIO | CANARY | COWCOD | DRKBLTCH | POP | WIDOW | Y'EYE |
| N 40 10 | ABERDEEN | | √ | | | | | √ |
| | ASTORIA | | √ | | √ | √ | √ | √ |
| | BANDON | | √ | | | | | √ |
| | BELLINGHAM BAY | | √ | | √ | √ | | √ |
| | BLAINE | | √ | | √ | √ | | √ |
| | BROOKINGS | | √ | | √ | √ | | √ |
| | CATHLAMET | | √ | | | | | √ |
| | CHARLESTON (COOS BAY) | | √ | | √ | √ | √ | √ |
| | CHINOOK | | √ | | | | | √ |
| | CRESCENT CITY | | √ | | √ | √ | √ | √ |
| | DEPOE BAY | | √ | | | | | √ |
| | EUREKA | | √ | | √ | √ | √ | √ |
| | EVERETT | | √ | | | | | √ |
| | FIELDS LANDING | | √ | | | | | √ |
| | FLORENCE | | √ | | | | | √ |
| | GARIBALDI (TILLAMOOK) | | √ | | | | | √ |
| | GOLD BEACH | | √ | | | | | √ |
| | ILWACO | | √ | | √ | √ | √ | √ |
| | LAPUSH | | √ | | | | | √ |
| | MILL CREEK | | √ | | | | | √ |
| | NEAH BAY | | √ | | √ | √ | | √ |
| | NEWPORT | | √ | | √ | √ | √ | √ |
| | PACIFIC CITY | | √ | | | | | √ |
| | PORT ANGELES | | √ | | | | | √ |
| | PORT ORFORD | | √ | | | | | √ |
| | PORT TOWNSEND | | √ | | | | | √ |
| | SEATTLE | | √ | | | | √ | √ |
| | TOKELAND | | √ | | | | | √ |
| | TRINIDAD | | √ | | | | | √ |
| | WESTPORT | | √ | | √ | √ | √ | √ |
| | WINCHESTER BAY | | √ | | | | | √ |
| 38 – 40 10 | ALBION | √ | √ | | | | | |
| | BODEGA BAY | √ | √ | | | | | |
| | FORT BRAGG | √ | √ | | √ | | | |
| | POINT ARENA | √ | √ | | | | | |
| | POINT REYES | √ | √ | | | | | |
| | SHELTER COVE | √ | √ | | | | | |
| 36 - 38 | BIG CREEK | √ | √ | √ | | | | |
| | BODEGA BAY | √ | √ | √ | | | | |
| | ELK | √ | √ | √ | | | | |
| | MONTEREY | √ | √ | √ | | | | |
| | MOSS LANDING | √ | √ | √ | | | | |
| | PRINCETON / HALF MOON BAY | √ | √ | √ | | | | |
| | SAN FRANCISCO | √ | √ | √ | | | | |
| | SANTA CRUZ | √ | √ | √ | | | | |
| | SANTA CRUZ | √ | √ | √ | | | | |
| S 36 | AVILA | √ | | √ | | | | |
| | BERKELEY | √ | | √ | | | | |
| | DANA POINT | √ | | √ | | | | |
| | LONG BEACH | √ | | √ | | | | |
| | MISSION BAY | √ | | √ | | | | |
| | MORRO BAY | √ | | √ | | | | |
| | NEWPORT BEACH | √ | | √ | | | | |
| | OCEANSIDE | √ | | √ | | | | |
| | OXNARD | √ | | √ | | | | |
| | PLAYA DEL REY | √ | | √ | | | | |
| | POINT LOMA | √ | | √ | | | | |
| | SAN DIEGO | √ | | √ | | | | |
| | SAN PEDRO | √ | | √ | | | | |
| | SAN SIMEON | √ | | √ | | | | |
| | SANTA BARBARA | √ | | √ | | | | |
| | TERMINAL ISLAND | √ | | √ | | | | |
| | VENTURA | √ | | √ | | | | |
| | WILMINGTON | √ | | √ | | | | |

Each sector/region combination has a different level of impact on overfished species, and therefore, a different likelihood that sector would be impacted by management if reductions in the catch of overfished species are necessary. Table A.2-7 through Table A.2-10 shows the relative likelihood that a particular area/sector/port combination would need to be restricted in order to achieve reductions in the aggregate catch of overfished species. Blank cells indicate a low/no likelihood that a particular area/sector/port combination would need to be restricted to achieve reductions in the aggregate catch of overfished species.

**Table A.2-7. Relative Likelihood of LE Trawl Ports Being Affected by Management to Reduce Overfished Species Catch**

| AREA | SECTOR | PORT | BCACCIO | CANARY | COWCOD | DRKBLTCH | POP | WDOW |
|---|---|---|---|---|---|---|---|---|
| N 40 10 | LE B-TRAWL-DEEP | ASTORIA | | ML | | HIGH | HIGH | |
| | | BELLINGHAM BAY | | ML | | HIGH | HIGH | |
| | | BLAINE | | ML | | HIGH | HIGH | |
| | | BROOKINGS | | ML | | HIGH | HIGH | |
| | | CHARLESTON | | ML | | HIGH | HIGH | |
| | | CRESCENT CITY | | ML | | HIGH | HIGH | |
| | | EUREKA | | ML | | HIGH | HIGH | |
| | | NEAH BAY | | ML | | HIGH | HIGH | |
| | | NEWPORT | | ML | | HIGH | HIGH | |
| | | WESTPORT | | ML | | HIGH | HIGH | |
| | LE B-TRAWL-SHELF | ASTORIA | | HIGH | | | | |
| | | BELLINGHAM BAY | | HIGH | | | | |
| | | BLAINE | | HIGH | | | | |
| | | BROOKINGS | | HIGH | | | | |
| | | CHARLESTON | | HIGH | | | | |
| | | CRESCENT CITY | | HIGH | | | | |
| | | EUREKA | | HIGH | | | | |
| | | NEAH BAY | | HIGH | | | | |
| | | NEWPORT | | HIGH | | | | |
| | | WESTPORT | | HIGH | | | | |
| | LE MW-TRAWL-WHITING | ASTORIA | | HIGH | | ML | ML | HIGH |
| | | CHARLESTON | | HIGH | | ML | ML | HIGH |
| | | CRESCENT CITY | | HIGH | | ML | ML | HIGH |
| | | EUREKA | | HIGH | | ML | ML | HIGH |
| | | ILWACO | | HIGH | | ML | ML | HIGH |
| | | NEWPORT | | HIGH | | ML | ML | HIGH |
| | | SEATTLE | | HIGH | | | | HIGH |
| | | WESTPORT | | HIGH | | ML | ML | HIGH |
| 38 - 40 10 | LE B-TRAWL-DEEP | FORT BRAGG | ML | ML | | MH | | |
| | LE B-TRAWL-SHELF | FORT BRAGG | HIGH | MH | | | | |
| 36 - 38 | LE B-TRAWL-DEEP | MONTEREY | ML | ML | | | | |
| | | MOSS LANDING | ML | ML | | | | |
| | | PRINCETON / HALF MOON BAY | ML | | | | | |
| | | SAN FRANCISCO | ML | ML | | | | |
| | LE B-TRAWL-SHELF | MONTEREY | HIGH | ML | MH | | | |
| | | MOSS LANDING | HIGH | ML | MH | | | |
| | | PRINCETON / HALF MOON BAY | HIGH | ML | MH | | | |
| | | SAN FRANCISCO | HIGH | ML | MH | | | |
| S 36 | LE B-TRAWL-DEEP | MORRO BAY | ML | | | | | |
| | LE B-TRAWL-SHELF | MORRO BAY | HIGH | | MH | | | |

**Table A.2-8. Relative Likelihood of LE Fixed Gear Ports Being Affected by Management to Reduce Overfished Species Catch**

| | | | OVERFISHED SPECIES | | | |
|---|---|---|---|---|---|---|
| AREA | SECTOR | PORT | BOCACCIO | CANARY | COWCOD | YELLOWEYE |
| N 40 10 | LE FG-DOGFISH | BELLINGHAM BAY | | ML | | MH |
| | | BLAINE | | ML | | MH |
| | LE FG-NEARSHORE | ASTORIA | | ML | | MH |
| | | CRESCENT CITY | | ML | | MH |
| | | PORT ORFORD | | ML | | MH |
| | LE FG-SABLEFISH | ASTORIA | | ML | | MH |
| | | BELLINGHAM BAY | | ML | | MH |
| | | BLAINE | | ML | | MH |
| | | BROOKINGS | | ML | | MH |
| | | CATHLAMET | | ML | | MH |
| | | CHARLESTON | | ML | | MH |
| | | CHINOOK | | ML | | MH |
| | | CRESCENT CITY | | ML | | MH |
| | | EUREKA | | ML | | MH |
| | | EVERETT | | ML | | MH |
| | | GARIBALDI | | ML | | MH |
| | | ILWACO | | ML | | MH |
| | | LAPUSH | | ML | | MH |
| | | NEAH BAY | | ML | | MH |
| | | NEWPORT | | ML | | MH |
| | | PORT ANGELES | | ML | | MH |
| | | PORT ORFORD | | ML | | MH |
| | | WESTPORT | | ML | | MH |
| | | WINCHESTER BAY | | ML | | MH |
| 38 - 40 10 | LE FG-SABLEFISH | BODEGA BAY | ML | ML | | |
| | | FORT BRAGG | ML | ML | | |
| 36 - 38 | LE FG-NEARSHORE | SAN FRANCISCO | ML | ML | ML | |
| | LE FG-SABLEFISH | MONTEREY | ML | ML | ML | |
| | | MOSS LANDING | ML | ML | ML | |
| | | PRINCETON / HALF MOON BAY | ML | ML | ML | |
| | | SAN FRANCISCO | ML | ML | ML | |
| S 36 | LE FG-NEARSHORE | OXNARD | ML | | ML | |
| | | SANTA BARBARA | ML | | ML | |
| | | WILMINGTON | ML | | ML | |
| | LE FG-SABLEFISH | AVILA | ML | | ML | |
| | | DANA POINT | ML | | ML | |
| | | LONG BEACH | ML | | ML | |
| | | MISSION BAY | ML | | ML | |
| | | MORRO BAY | ML | | ML | |
| | | NEWPORT BEACH | ML | | ML | |
| | | OCEANSIDE | ML | | ML | |
| | | OXNARD | ML | | ML | |
| | | PLAYA DEL REY | ML | | ML | |
| | | TERMINAL ISLAND | ML | | ML | |

**Table A.2-9. Relative Likelihood of OA Fixed Gear Ports North of 40 Degrees 10 Minutes Latitude Being Affected by Management to Reduce Overfished Species Catch**

| | | | OVERFISHED SPECIES | | | |
|---|---|---|---|---|---|---|
| AREA | SECTOR | PORT | BOCACCIO | CANARY | COWCOD | YELLOWEYE |
| N 40 10 | OA FG-DOGFISH | BELLINGHAM BAY | | ML | | MH |
| | OA FG-NEARSHORE | BROOKINGS | | MH | | MH |
| | | CHARLESTON (COOS BAY) | | MH | | MH |
| | | CRESCENT CITY | | MH | | MH |
| | | DEPOE BAY | | MH | | MH |
| | | EUREKA | | MH | | MH |
| | | GARIBALDI (TILLAMOOK) | | MH | | MH |
| | | GOLD BEACH | | MH | | MH |
| | | MILL CREEK | | MH | | MH |
| | | NEWPORT | | MH | | MH |
| | | PACIFIC CITY | | MH | | MH |
| | | PORT ORFORD | | MH | | MH |
| | | TRINIDAD | | MH | | MH |
| | OA FG-SABLEFISH | ABERDEEN | | ML | | MH |
| | | ASTORIA | | ML | | MH |
| | | BANDON | | ML | | MH |
| | | BELLINGHAM BAY | | ML | | MH |
| | | BROOKINGS | | ML | | MH |
| | | CHARLESTON (COOS BAY) | | ML | | MH |
| | | CHINOOK | | ML | | MH |
| | | CRESCENT CITY | | ML | | MH |
| | | EUREKA | | ML | | MH |
| | | FIELDS LANDING | | ML | | MH |
| | | FLORENCE | | ML | | MH |
| | | GARIBALDI (TILLAMOOK) | | ML | | MH |
| | | ILWACO | | ML | | MH |
| | | LAPUSH | | ML | | MH |
| | | NEAH BAY | | ML | | MH |
| | | NEWPORT | | ML | | MH |
| | | PORT ANGELES | | ML | | MH |
| | | PORT ORFORD | | ML | | MH |
| | | PORT TOWNSEND | | ML | | MH |
| | | SEATTLE | | ML | | MH |
| | | TOKELAND | | ML | | MH |
| | | WESTPORT | | ML | | MH |
| | | WINCHESTER BAY | | ML | | MH |

**Table A.2-10. Relative Likelihood of OA Fixed Gear Ports South of 40 Degrees 10 Minutes Latitude Being Affected by Management to Reduce Overfished Species Catch**

| | | | OVERFISHED SPECIES | | | |
|---|---|---|---|---|---|---|
| AREA | SECTOR | PORT | BOCACCIO | CANARY | COWCOD | YELLOWEYE |
| 38 - 40 | OA FG-NEARSHORE | ALBION | ML | ML | | |
| | | BODEGA BAY | ML | ML | | |
| | | FORT BRAGG | ML | ML | | |
| | | POINT ARENA | ML | ML | | |
| | | SHELTER COVE | ML | ML | | |
| | OA FG-SABLEFISH | FORT BRAGG | ML | ML | | |
| | | POINT REYES | ML | ML | | |
| 36 - 38 | OA FG-NEARSHORE | BIG CREEK | ML | ML | ML | |
| | | MONTEREY | ML | ML | ML | |
| | | MOSS LANDING | ML | ML | ML | |
| | | PRINCETON / HALF MOON BAY | ML | ML | ML | |
| | | SAN FRANCISCO | ML | ML | ML | |
| | | SANTA CRUZ | ML | ML | ML | |
| | OA FG-SABLEFISH | BODEGA BAY | ML | ML | ML | |
| | | ELK | ML | ML | ML | |
| | | MONTEREY | ML | ML | ML | |
| | | MOSS LANDING | ML | ML | ML | |
| | | PRINCETON / HALF MOON BAY | ML | ML | ML | |
| | | SAN FRANCISCO | ML | ML | ML | |
| | | SANTA CRUZ | ML | ML | ML | |
| S 36 | OA FG-NEARSHORE | AVILA | ML | | ML | |
| | | BERKELEY | ML | | ML | |
| | | MORRO BAY | ML | | ML | |
| | | OXNARD | ML | | ML | |
| | | SAN DIEGO | ML | | ML | |
| | | SAN PEDRO | ML | | ML | |
| | | SAN SIMEON | ML | | ML | |
| | | SANTA BARBARA | ML | | ML | |
| | | VENTURA | ML | | ML | |
| | OA FG-SABLEFISH | MISSION BAY | ML | | ML | |
| | | MORRO BAY | ML | | ML | |
| | | OCEANSIDE | ML | | ML | |
| | | OXNARD | ML | | ML | |
| | | POINT LOMA | ML | | ML | |
| | | SAN DIEGO | ML | | ML | |
| | | TERMINAL ISLAND | ML | | ML | |
| | | VENTURA | ML | | ML | |

### *A.2.4 Summary*

In general, this document can be separated in two parts. The first section shows the relationship between exvessel revenue and overfished species mortality. The second section shows the relationship between sectors, ports, and regions and overfished species management. Each section has an implied management strategy that is somewhat different but complimentary. The first section implies that incidental catch of overfished species is achieved by reducing the targeting of least valuable species first in order to maintain the highest level of exvessel revenue. The second section implies that sectors that have the largest impact on overfished species will be the most likely sector to be restricted in order to achieve reductions in overfished species catch. While these approaches appear different, both are used on a routine basis in management. The management strategy implied within the first section is used on a within-sector basis, while the management strategy implied within the second section is used on an across-sector basis. That is,

in order to achieve some level of mortality for a specific sector (like the limited entry bottom trawl or open access sector), management has historically been designed to maintain targeting of the most valuable species within that sector. If total reductions in overfished species mortality on a coastwide basis are necessary, management strategies are more likely to look for those reductions to come from sectors that have the largest degree of impact. This second approach is routinely used because a smaller percent decrease in exvessel revenues is more likely to achieve substantial reductions in overfished species mortality in a sector that has a high impact on overfished species than in a sector with a small impact on overfished species. Put in other words, if a 5 metric ton reduction in the mortality of widow rockfish is necessary, it is estimated that it would cost the whiting fleet 3% of revenues (assuming a decrease in the whiting OY from 280,000 to 270,392 mt) whereas if that reduction came from other sectors, it may require a complete closure of multiple sectors to achieve that same reduction.

The first section of this document showed that management measures protecting different overfished species have different exvessel revenue impacts on a particular sector. The catch of darkblotched rockfish in the bottom trawl fishery for example is generally associated with the catch of high valued target species, whereas the catch of bocaccio rockfish is more often associated with the catch of lower valued shelf flatfish species. This means that it is more costly to achieve a given percent reduction in darkblotched rockfish catch than to achieve that same percent reduction in bocaccio rockfish catch. In addition to different overfished species having different implied relative values, the distribution of these impacts across fishing communities can also be substantially different. While darkblotched rockfish arguably has a higher implied value in the bottom trawl fishery than bocaccio rockfish, management designed to achieve a reduction in bocaccio rockfish catch would affect many more ports and sectors than management designed to achieve reductions in darkblotched rockfish catch.

These findings have several implications depending on the management objective. If the objective is to affect the fewest number of ports and sectors, then it would arguably make sense to keep the catch of species that impact large numbers of ports and sectors like bocaccio relatively high. However, if the objective is to maintain total exvessel revenues at the highest possible level, then it arguably would make sense to keep the catch of species associated with high valued target species–such as darkblotched rockfish in the bottom trawl fishery–relatively high. In reality, the objective may be some combination of both.

## A.3 Commercial fisheries information generated from PacFIN data

### Table A.3-1. Revenue Description by Port, 2005

| State | Port | Total Revenue 2005 | Revenue as a share of coastwide revenue | Groundfish Revenue 2005 | Groundfish as a share of total fish revenue | Groundfish as a share of coastwide groundfish revenue |
|---|---|---|---|---|---|---|
| **WASHINGTON** | | | | | | |
| | Anacortes | $1,940,597 | 0.9% | | | |
| | Bellingham Bay | $9,941,236 | 4.5% | $5,496,688 | 55.3% | 10.6% |
| | Blaine | $2,170,655 | 1.0% | $802,825 | 37.0% | 1.6% |
| | Everett | $766,347 | 0.3% | $572,328 | 74.7% | 1.1% |
| | Friday Harbor | $72,068 | | | | |
| | Grays Harbor | * | * | | | |
| | Ilwaco/Chinook | $10,850,699 | 4.9% | $1,592,112 | 14.7% | 3.1% |
| | La Conner | $295,191 | 0.1% | | | |
| | La Push | * | * | * | * | * |
| | Neah Bay | $945,646 | 0.4% | $606,119 | 64.1% | 1.2% |
| | Olympia | * | | | | |
| | Other North Puget Sound | $84,377 | | | | |
| | Other or Unknown WA | * | | | | |
| | Other South Puget Sound | * | | | | |
| | Other WA Coast | * | | | | |
| | Port Angeles | $777,805 | 0.4% | $363,198 | 46.7% | 0.7% |
| | Port Townsend | $467,135 | 0.2% | $1,364 | 0.3% | |
| | Seattle | $1,164,059 | 0.5% | $186,292 | 16.0% | 0.4% |
| | Sequim | * | | | | |
| | Shelton | * | | | | |
| | Tacoma | $259,860 | 0.1% | | | |
| | Westport | $32,151,049 | 14.6% | $4,647,440 | 14.5% | 9.0% |
| | Willapa Bay | $3,348,827 | 1.5% | $1,358 | | |
| **OREGON** | | | | | | |
| | Astoria | $29,501,208 | 13.4% | $9,415,241 | 31.9% | 18.2% |

| | | | | | |
|---|---|---|---|---|---|
| Bandon | * | * | * | * | * |
| Brookings | $3,265,357 | 1.5% | $906,223 | 27.8% | 1.8% |
| Cannon Beach | * | | | | |
| Coos Bay | $17,141,932 | 7.8% | $4,218,087 | 24.6% | 8.1% |
| Depoe Bay | $105,813 | | $4,041 | 3.8% | |
| Florence | $71,210 | | | | |
| Gearhart - Seaside | * | | | | |
| Gold Beach | * | * | * | * | * |
| Nehalem Bay | * | | | 0.0% | |
| Newport | $24,314,506 | 11.1% | $8,728,721 | 35.9% | 16.9% |
| Other Columbia River | $330,590 | 0.2% | $19,184 | 5.8% | |
| Pacific City | $90,362 | | $47,964 | 53.1% | 0.1% |
| Port Orford | $2,503,640 | 1.1% | $1,023,236 | 40.9% | 2.0% |
| Pseudo Port Code for Columbia River | $1,880,055 | 0.9% | | | |
| Tillamook/Garibaldi | $3,331,220 | 1.5% | $76,404 | 2.3% | 0.1% |
| Waldport | $13,654 | | | | |
| Winchester Bay | $1,461,926 | 0.7% | $27,462 | 1.9% | 0.1% |
| Yachats | * | | | | |
| **CALIFORNIA** | | | | | |
| Alameda | * | | | | |
| Albion | * | * | * | * | * |
| Avila | $555,741 | 0.3% | $390,150 | 70.2% | 0.8% |
| Berkeley | $69,119 | | $12,350 | 17.9% | |
| Bodega Bay | $2,232,296 | 1.0% | $63,415 | 2.8% | 0.1% |
| Crescent City | $6,121,760 | 2.8% | $1,163,482 | 19.0% | 2.2% |
| Dana Point | $828,200 | 0.4% | $60,559 | 7.3% | 0.1% |
| Eureka | $4,865,220 | 2.2% | $2,566,598 | 52.8% | 5.0% |
| Fort Bragg | $4,943,778 | 2.3% | $2,008,275 | 40.6% | 3.9% |
| Long Beach | $443,823 | 0.2% | $8,117 | 1.8% | |
| Monterey | $1,057,724 | 0.5% | $178,626 | 16.9% | 0.3% |
| Morro Bay | $1,799,325 | 0.8% | $868,220 | 48.3% | 1.7% |
| Moss Landing | $4,035,353 | 1.8% | $928,340 | 23.0% | 1.8% |

| | | | | | |
|---|---|---|---|---|---|
| Newport Beach | $260,829 | 0.1% | $108,500 | 41.6% | 0.2% |
| Oakland | * | | | | |
| Oceanside | $807,963 | 0.4% | $233,281 | 28.9% | 0.5% |
| Other Humboldt County | $48,518 | | $6,502 | 13.4% | |
| Other LA and Orange County | $839,092 | 0.4% | $443,034 | 52.8% | 0.9% |
| Other Mendocino County | $15,158 | | $1,835 | 12.1% | |
| Other or Unknown California | $23,674 | | $364 | 1.5% | |
| Other San Diego County | $1,212,387 | 0.6% | $264,043 | 21.8% | 0.5% |
| Other San Luis Obispo | * | * | * | * | * |
| Other Santa Barbara and Ventura | * | | | | |
| Other Santa Cruz and Monterey | $29,670 | | $29,670 | 100.0% | 0.1% |
| Other SF Bay and San Mateo | $173,979 | 0.1% | $2,868 | 1.6% | |
| Other Sonoma and Marin | $127,311 | 0.1% | $9,215 | 7.2% | |
| Oxnard | $2,204,775 | 1.0% | $279,976 | 12.7% | 0.5% |
| Point Arena | $312,509 | 0.1% | $57,045 | 18.3% | 0.1% |
| Point Reyes | * | | | | |
| Port Hueneme | $5,653,285 | 2.6% | $77 | | |
| Princeton/Half Moon Bay | $3,551,856 | 1.6% | $819,297 | 23.1% | 1.6% |
| Richmond | $25,318 | | | | |
| San Diego | $766,907 | 0.3% | $47,966 | 6.3% | 0.1% |
| San Francisco | $4,427,387 | 2.0% | $1,486,200 | 33.6% | 2.9% |
| San Pedro | $5,325,844 | 2.4% | $22,354 | 0.4% | |
| Santa Barbara | $4,067,231 | 1.9% | $124,504 | 3.1% | 0.2% |
| Santa Cruz | $1,020,599 | 0.5% | $80,049 | 7.8% | 0.2% |
| Sausalito | $42,417 | | | | |
| Terminal Island | $4,756,695 | 2.2% | $127,784 | 2.7% | 0.2% |
| Tomales Bay | * | | | | |
| Trinidad | $985,034 | 0.4% | $26,307 | 2.7% | 0.1% |
| Ventura | $4,623,809 | 2.1% | $8,190 | 0.2% | |
| Willmington | $59,164 | | $36,597 | 61.9% | 0.1% |
| **Total Coastwide Revenue** | **$219,500,864** | | **$51,769,085** | | |

**Note: An asterix(*) indicates confidential data.**

## Table A.3-2. Ex_Vessel Revenue in $1000s by Port and Sector for 2003-05 and Five Year Average

| | | Non-whiting Grd Trawl | | | | Fixed-Gear | | | | Whiting Trawl | | | | Total Groundfish Revenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| State | Port Name | 2003 | 2004 | 2005 | 2000-04 Avg | 2003 | 2004 | 2005 | 2000-04 Avg | 2003 | 2004 | 2005 | 2000-04 Avg | 2003 | 2004 | 2005 | 2000-04 Avg |
| **WASHINGTON** | | | | | | | | | | | | | | | | | |
| | BELLINGHAM BAY | $2,419 | $2,513 | $1,416 | $2,510 | $4,288 | $4,439 | $4,080 | $4,426 | | | | | $6,707 | $6,952 | $5,497 | $6,936 |
| | BLAINE | $1,345 | $1,527 | $803 | $1,461 | | | | | | $23 | | $22 | $1,345 | $1,550 | $803 | $1,478 |
| | COPALIS BEACH | | | | | | | | $1 | | | | | $0 | | | $1 |
| | EVERETT | | | | | $327 | $462 | $572 | $276 | | | | | $327 | $462 | $572 | $276 |
| | GRAYS HARBOR | | * | | * | * | * | | * | | | | | * | * | | * |
| | ILWACO/CHINOOK | | | | $201 | $682 | $168 | $619 | $225 | $247 | $277 | $973 | $186 | $929 | $445 | $1,592 | $717 |
| | LA CONNER | | | | | | | | $29 | | | | | | | | $29 |
| | LA PUSH | | | | | * | * | * | * | | | | | * | * | * | * |
| | NEAH BAY | $1,032 | $385 | $491 | $706 | $438 | $254 | $115 | $153 | | | | | $1,471 | $638 | $606 | $859 |
| | OTHER OR UNKNOWN WASHI | | | | * | | | | * | | | | | | | | * |
| | PORT ANGELES | | $226 | $97 | $494 | $103 | $336 | $266 | $504 | | | | | $103 | $562 | $363 | $899 |
| | PORT TOWNSEND | | | | $6 | $55 | | $1 | $23 | | | | | $55 | | $1 | $25 |
| | SEATTLE | | | | $20 | $278 | | $186 | $398 | | | | | $278 | | $186 | $407 |
| | WESTPORT | $414 | $440 | $366 | $568 | $1,097 | $825 | $1,046 | $734 | $1,167 | $1,899 | $3,235 | $1,506 | $2,679 | $3,165 | $4,647 | $4,313 |
| | WILLAPA BAY | | | | | $5 | $6 | $1 | $4 | | | | | $5 | $6 | $1 | $4 |
| **OREGON** | | | | | | | | | | | | | | | | | |
| | ASTORIA | $5,660 | $6,113 | $6,021 | $6,445 | $952 | $820 | $1,225 | $1,243 | $1,559 | $1,395 | $2,169 | $1,918 | $8,172 | $8,328 | $9,415 | $11,524 |
| | BANDON | | | | | * | * | * | * | | | | | * | * | * | * |
| | BROOKINGS | $1,241 | $581 | $739 | $1,115 | $222 | $156 | $167 | $162 | | | | $2 | $1,463 | $737 | $906 | $1,278 |
| | COOS BAY | $3,760 | $2,816 | $2,395 | $3,804 | $1,014 | $987 | $1,406 | $953 | $212 | $354 | $416 | $202 | $4,986 | $4,157 | $4,218 | $5,160 |
| | DEPOE BAY | | | | | $7 | $8 | $4 | $14 | | | | | $7 | $8 | $4 | $14 |
| | FLORENCE | $23 | $16 | | $18 | $192 | $1 | | $191 | | | | | $215 | $17 | | $209 |
| | GOLD BEACH | | | | | * | * | * | * | | | | | * | * | * | * |
| | NEWPORT | $2,916 | $2,550 | $2,034 | $3,236 | $1,968 | $2,159 | $1,868 | $1,829 | $2,184 | $3,284 | $4,827 | $2,759 | $7,068 | $7,993 | $8,729 | $10,582 |
| | OTHER COLUMBIA RIVER P | | | | | | | $19 | | | | | | | | $19 | |
| | PACIFIC CITY | | | | | $47 | $48 | $48 | $37 | | | | | $47 | $48 | $48 | $37 |
| | PORT ORFORD | | | | | $965 | $925 | $1,023 | $1,092 | | | | | $965 | $925 | $1,023 | $1,092 |
| | TILLAMOOK/GARIBALDI | $93 | $53 | $9 | $120 | $161 | $146 | $67 | $122 | | | | | $254 | $200 | $76 | $242 |
| | WINCHESTER BAY | | | $2 | $1 | $89 | $4 | $25 | $81 | | | | | $89 | $4 | $27 | $81 |
| **CALIFORNIA** | | | | | | | | | | | | | | | | | |
| | ALBION | | | | | $24 | $36 | $18 | $31 | | | | | $24 | $36 | $18 | $31 |
| | AVILA | $890 | $522 | $8 | $698 | $352 | $470 | $382 | $372 | | | | | $1,242 | $992 | $390 | $1,070 |
| | BERKELEY | | | | $13 | $9 | $8 | $12 | $15 | | | | | $9 | $8 | $12 | $21 |
| | BODEGA BAY | $286 | $29 | | $259 | $47 | $96 | $63 | $119 | | | | | $333 | $125 | $63 | $378 |
| | CRESCENT CITY | $1,160 | $473 | $699 | $1,370 | $707 | $469 | $464 | $622 | $3 | $155 | | $215 | $1,870 | $1,096 | $1,163 | $2,337 |
| | DANA POINT | | | | | $211 | $357 | $61 | $164 | | | | | $211 | $357 | $61 | $164 |
| | EUREKA | $2,597 | $1,987 | $1,929 | $2,461 | $451 | $331 | $276 | $493 | $176 | $536 | $362 | $234 | $3,224 | $2,854 | $2,567 | $3,421 |
| | FIELDS LANDING | | | | * | * | | | * | | | | * | * | | | * |
| | FORT BRAGG | $1,650 | $1,458 | $1,390 | $2,075 | $836 | $939 | $618 | $908 | | | | | $2,486 | $2,397 | $2,008 | $2,983 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LONG BEACH | | | | | $105 | $35 | $8 | $70 | | $105 | $35 | $8 | $70 |
| MONTEREY | $275 | $325 | $96 | $363 | $147 | $155 | $82 | $269 | $0 | $422 | $480 | $179 | $633 |
| MORRO BAY | $144 | $562 | $467 | $244 | $621 | $560 | $402 | $681 | | $764 | $1,121 | $868 | $925 |
| MOSS LANDING | $993 | $837 | $566 | $859 | $1,016 | $612 | $358 | $948 | | $2,009 | $1,448 | $928 | $1,807 |
| NEWPORT BEACH | | | | | $306 | $199 | $109 | $254 | | $306 | $199 | $109 | $254 |
| OAKLAND | | | | | | | | * | | | | | * |
| OCEANSIDE | $1 | | | $2 | $411 | $108 | $233 | $322 | | $412 | $108 | $233 | $323 |
| OTHER DEL NORTE COUNTY | | | | | | * | | * | | | * | | * |
| OTHER HUMBOLDT COUNTY | | | | $3 | $15 | $15 | $7 | $20 | | $15 | $15 | $7 | $20 |
| OTHER LA AND ORANGE CNTY | | | | | $241 | $385 | $443 | $200 | | $241 | $385 | $443 | $200 |
| OTHER MENDOCINO COUNTY | $9 | | | $4 | | $4 | $2 | $2 | | $10 | $4 | $2 | $5 |
| OTHER OR UNKNOWN CALIF | | | | | | | | $1 | | | | | $1 |
| OTHER S. F. BAY AND SA | $9 | $1 | $3 | $6 | | | | $5 | | $9 | $1 | $3 | $11 |
| OTHER SAN DIEGO COUNTY | | | | | $270 | $307 | $264 | $235 | | $270 | $307 | $264 | $235 |
| OTHER SAN LUIS OBISPO | | | | * | * | * | * | * | | * | * | * | * |
| OTHER SANTA BARBARA AN | | | | | * | * | | * | | * | * | | * |
| OTHER SANTA CRUZ AND M | | | | | $30 | $42 | $30 | $50 | | $30 | $42 | $30 | $50 |
| OTHER SONOMA AND MARIN | | $2 | $1 | $1 | $9 | $15 | $8 | $12 | | $9 | $17 | $9 | $13 |
| OXNARD | | | $1 | $12 | $357 | $418 | $279 | $527 | | $358 | $418 | $280 | $537 |
| POINT ARENA | | | | | $34 | $92 | $57 | $68 | | $34 | $92 | $57 | $68 |
| POINT REYES | | | | * | * | * | | * | | * | * | | * |
| PORT HUENEME | $55 | | | $107 | | $3 | | $2 | | $55 | $3 | | $66 |
| PRINCETON / HALF MOON | $715 | $675 | $722 | $856 | $127 | $93 | $98 | $138 | | $842 | $768 | $819 | $994 |
| RICHMOND | | | | | $3 | | | $2 | | $3 | | | $2 |
| SAN DIEGO | | | | $3 | $102 | $82 | $48 | $169 | | $102 | $82 | $48 | $170 |
| SAN FRANCISCO | $1,153 | $1,600 | $1,298 | $1,387 | $296 | $363 | $188 | $439 | | $1,449 | $1,964 | $1,486 | $1,826 |
| SAN PEDRO | | | | | $27 | $32 | $22 | $41 | | $28 | $32 | $22 | $41 |
| SANTA BARBARA | $90 | $13 | $0 | $117 | $269 | $203 | $124 | $403 | | $359 | $216 | $125 | $520 |
| SANTA CRUZ | $19 | $38 | $54 | $52 | $60 | $54 | $26 | $63 | | $80 | $92 | $80 | $116 |
| SAUSALITO | | | | | | | | $1 | | | | | $1 |
| TERMINAL ISLAND | | | | $6 | $97 | $171 | $128 | $156 | | $97 | $171 | $128 | $160 |
| TOMALES BAY | | | | * | * | | | * | | | | | * |
| TRINIDAD | | | | $0 | $10 | $11 | $26 | $18 | | $10 | $11 | $26 | $18 |
| VENTURA | $73 | $6 | $1 | $68 | $71 | $104 | $7 | $100 | | $144 | $110 | $8 | $168 |
| WILLMINGTON | | | | | $36 | $50 | $37 | $44 | | $36 | $50 | $37 | $44 |

**Note: An asterix (*) indicates confidential data.**

## Table A.3-3. Total Vessels by Port, 2003-05 and Five Year Average

| State | Port | 2003 | 2004 | 2005 | 2000-2004 Average |
|---|---|---|---|---|---|
| **WASHINGTON** | | | | | |
| | Anacortes | 119 | 109 | 107 | 113 |
| | Bellingham Bay | 303 | 272 | 232 | 326 |
| | Blaine | 180 | 156 | 101 | 191 |
| | Copalis Beach | 1 | 0 | 0 | 10 |
| | Everett | 41 | 69 | 47 | 81 |
| | Friday Harbor | 25 | 25 | 14 | 18 |
| | Grays Harbor | 38 | 21 | 27 | 39 |
| | Ilwaco/Chinook | 339 | 243 | 169 | 269 |
| | La Conner | 84 | 78 | 76 | 62 |
| | La Push | 32 | 30 | 35 | 29 |
| | Neah Bay | 82 | 61 | 60 | 40 |
| | Olympia | 3 | 0 | 2 | 2 |
| | Oth No Puget Snd ports | 47 | 45 | 16 | 33 |
| | Oth So Puget Snd ports | 23 | 17 | 5 | 14 |
| | Oth WA coastal ports | 11 | 10 | 10 | 16 |
| | Other Col R ports | 68 | 118 | 75 | 79 |
| | Other/unknown WA | 1 | 0 | 17 | 14 |
| | Port Angeles | 56 | 58 | 82 | 83 |
| | Pt Townsend | 46 | 45 | 45 | 49 |
| | Seattle | 158 | 146 | 114 | 177 |
| | Sequim | 18 | 9 | 11 | 15 |
| | Shelton | 3 | 2 | 7 | 4 |
| | Tacoma | 53 | 44 | 32 | 52 |
| | Westport | 323 | 312 | 269 | 307 |
| | Willapa Bay | 128 | 131 | 104 | 130 |
| **OREGON** | | | | | |
| | Astoria | 251 | 248 | 269 | 269 |
| | Bandon | 15 | 13 | 10 | 16 |
| | Brookings | 93 | 116 | 102 | 107 |
| | Cannon Beach | 3 | 2 | 4 | 3 |
| | Coos Bay | 357 | 430 | 392 | 316 |
| | Depoe Bay | 20 | 25 | 18 | 22 |
| | Florence | 56 | 30 | 18 | 47 |
| | Gearhart/Seaside | 0 | 4 | 5 | 2 |
| | Gold Beach | 37 | 32 | 40 | 43 |
| | Nehalem Bay | 3 | 2 | 2 | 3 |
| | Netarts Bay | 0 | 0 | 0 | 0 |
| | Newport | 400 | 447 | 451 | 397 |
| | Pacific City | 31 | 34 | 31 | 28 |
| | Port Orford | 72 | 79 | 80 | 78 |
| | Pseudo port code for Col R | 208 | 199 | 190 | 193 |
| | Salmon River | 0 | 0 | 0 | 0 |
| | Siletz Bay | 0 | 0 | 0 | 0 |
| | Tillamook/Garibaldi | 121 | 141 | 166 | 110 |
| | Waldport | 7 | 9 | 7 | 7 |
| | Winchester Bay | 70 | 74 | 75 | 61 |
| | Yachats | 0 | 1 | 1 | 0 |
| **CALIFORNIA** | | | | | |
| | Alameda | 3 | 6 | 4 | 14 |
| | Albion | 24 | 11 | 11 | 24 |

| | | | | |
|---|---|---|---|---|
| Avila | 114 | 100 | 63 | 118 |
| Berkeley | 27 | 23 | 27 | 36 |
| Bodega Bay | 267 | 284 | 234 | 284 |
| Crescent City | 155 | 168 | 134 | 170 |
| Dana Point | 67 | 60 | 52 | 57 |
| Eureka | 164 | 159 | 101 | 167 |
| Fields Landing | 21 | 6 | 9 | 27 |
| Fort Bragg | 297 | 294 | 257 | 264 |
| Long Beach | 19 | 15 | 12 | 23 |
| Monterey | 120 | 93 | 78 | 122 |
| Morro Bay | 155 | 117 | 111 | 184 |
| Moss Landing | 196 | 203 | 220 | 250 |
| Newport Beach | 25 | 26 | 19 | 28 |
| Oakland | 4 | 3 | 1 | 5 |
| Oceanside | 77 | 32 | 35 | 56 |
| Oth Del Norte cnty ports | 0 | 10 | 0 | 3 |
| Oth Humboldt cnty ports | 22 | 35 | 20 | 21 |
| Oth Marin/Sonoma outer coast ports | 43 | 52 | 30 | 43 |
| Oth Mendocino cnty ports | 21 | 8 | 9 | 14 |
| Oth Monterey/Sta Cruz cnty ports | 14 | 13 | 9 | 18 |
| Oth Orange/LA cnty ports | 93 | 90 | 78 | 92 |
| Oth San Diego cnty ports | 97 | 97 | 60 | 97 |
| Oth San Luis Obispo cnty ports | 9 | 4 | 2 | 13 |
| Oth SFBay/San Mateo cnty ports | 33 | 29 | 24 | 41 |
| Oth Ventura/Sta Barbara cnty ports | 5 | 8 | 1 | 5 |
| Other/unknown CA ports | 10 | 12 | 8 | 12 |
| Oxnard | 95 | 103 | 89 | 112 |
| Point Arena | 40 | 33 | 20 | 41 |
| Point Reyes | 12 | 18 | 20 | 21 |
| Port Hueneme | 46 | 56 | 41 | 55 |
| Princeton | 142 | 255 | 218 | 244 |
| Richmond | 27 | 19 | 9 | 17 |
| San Diego | 91 | 85 | 59 | 112 |
| San Francisco | 281 | 352 | 282 | 323 |
| San Pedro | 160 | 157 | 116 | 188 |
| Santa Barbara | 184 | 178 | 153 | 205 |
| Santa Cruz | 101 | 110 | 120 | 123 |
| Sausalito | 40 | 36 | 24 | 80 |
| Terminal Island | 159 | 161 | 116 | 190 |
| Tomales Bay | 5 | 5 | 2 | 4 |
| Trinidad | 25 | 27 | 22 | 28 |
| Ventura | 105 | 114 | 61 | 112 |
| Willmington | 8 | 8 | 13 | 6 |

## Table A.3-4. Vessels by Port and Sector for 2003-05 and Five Year Average

| | | Non-Whiting Groundfish Trawl | | | | Fixed Gear - Sablefish | | | | Fixed Gear - Pot and H&L Rockfish and Lingcod | | | | Whiting Trawl | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| State | Port | 2003 | 2004 | 2005 | 2000-04 Avg | 2003 | 2004 | 2005 | 2000-04 Avg | 2003 | 2004 | 2005 | 2000-04 Avg | 2003 | 2004 | 2005 | 2000-04 Avg |
| **WASHINGTON** | | | | | | | | | | | | | | | | | |
| | Anacortes | | | | | | | | | | | | | | | | |
| | Bellingham Bay | 12 | 10 | 6 | 13 | 29 | 35 | 24 | 34 | 20 | 12 | 11 | 20 | | | | |
| | Blaine | 9 | 7 | 4 | 10 | | | | | | | | 0 | | 1 | | |
| | Copalis Beach | | | | | | | | | | | | 0 | | | | |
| | Everett | | | | | 1 | 4 | 3 | 2 | 2 | 2 | 4 | 1 | | | | |
| | Friday Harbor | | | | | | | | | | | | | | | | |
| | Grays Harbor | | 1 | | 0 | 4 | 1 | | 3 | | | | | | | | |
| | Ilwaco/Chinook | | | | 2 | 33 | 19 | 31 | 21 | 2 | 3 | 5 | 3 | 3 | 1 | 3 | 2 |
| | La Conner | | | | | | | | 0 | | | | 0 | | | | |
| | La Push | | | | | 14 | 16 | 20 | 14 | | | | 3 | | | | |
| | Neah Bay | 8 | 6 | 8 | 9 | 17 | 13 | 11 | 7 | 4 | 2 | 4 | 2 | | | | |
| | Olympia | | | | | | | | | | | | | | | | |
| | Other Col R ports | | | | | | | 1 | | | | | | | | | |
| | Oth No Puget Snd ports | | | | | | | | | | | | | | | | |
| | Oth So Puget Snd ports | | | | | | | | | | | | | | | | |
| | Oth WA coastal ports | | | | | | | | | | | | | | | | |
| | Other/unknown WA | | | | 0 | | | | 1 | | | | | | | | |
| | Port Angeles | | 6 | 5 | 6 | 8 | 14 | 26 | 24 | | 3 | 5 | 11 | | | | |
| | Pt Townsend | | | | 1 | 5 | | 1 | 1 | | | | 0 | | | | |
| | Seattle | | | | 1 | 6 | | 2 | 5 | | | | 1 | | | | |
| | Sequim | | | | | | | | | | | | | | | | |
| | Shelton | | | | | | | | | | | | | | | | |
| | Tacoma | | | | | | | | | | | | | | | | |
| | Westport | 6 | 5 | 3 | 7 | 49 | 35 | 23 | 32 | | | 1 | 1 | 5 | 6 | 8 | 6 |
| | Willapa Bay | | | | | 4 | 3 | 1 | 3 | | | 1 | 0 | | | | |
| **OREGON** | | | | | | | | | | | | | | | | | |
| | Astoria | 38 | 28 | 29 | 36 | 41 | 35 | 35 | 38 | 3 | 3 | 4 | 4 | 10 | 6 | 5 | 10 |
| | Bandon | | | | | 3 | 1 | | 1 | 1 | 3 | 6 | 3 | | | | |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Brookings | 13 | 8 | 7 | 10 | 8 | 3 | 3 | 3 | 31 | 35 | 24 | 37 | | | | |
| | Cannon Beach | | | | | | | | | | | | | | | | |
| | Coos Bay | 27 | 19 | 20 | 25 | 27 | 23 | 37 | 25 | 6 | 8 | 39 | 17 | 3 | 3 | 2 | 3 |
| | Depoe Bay | | | | | | | | 1 | 6 | 4 | 3 | 6 | | | | |
| | Florence | 1 | 1 | | 1 | 4 | | | 4 | | 1 | | 1 | | | | |
| | Gearhart/Seaside | | | | | | | | | | | | | | | | |
| | Gold Beach | | | | | 2 | | 1 | 1 | 33 | 26 | 30 | 37 | | | | |
| | Nehalem Bay | | | | | | | | | | | | | | | | |
| | Newport | 25 | 24 | 23 | 29 | 45 | 48 | 33 | 40 | 11 | 9 | 6 | 15 | 13 | 13 | 12 | 12 |
| | Pacific City | | | | | | | | | 18 | 23 | 22 | 20 | | | | |
| | Port Orford | | | | | 33 | 23 | 28 | 21 | 47 | 50 | 47 | 55 | | | | |
| | Salmon River | | | | | | | | | | | | | | | | |
| | Tillamook/Garibaldi | 2 | 3 | 1 | 3 | 7 | 9 | 8 | 4 | 28 | 19 | 18 | 20 | | | | |
| | Winchester Bay | | | 1 | 0 | 6 | 1 | 4 | 5 | | | 2 | 2 | | | | |
| **CALIFORNIA** | | | | | | | | | | | | | | | | | |
| | Alameda | | | | | | | | | | | | 1 | | | | |
| | Albion | | | | 0 | 1 | | | 0 | 11 | 5 | 4 | 8 | | | | |
| | Avila | 16 | 8 | 2 | 12 | 1 | 1 | 1 | 1 | 72 | 57 | 39 | 65 | | | | |
| | Berkeley | | | | 1 | | 1 | | 1 | 3 | 3 | 7 | 8 | | | | |
| | Bodega Bay | 5 | 2 | | 5 | 2 | | 1 | 2 | 17 | 19 | 10 | 28 | | | | |
| | Crescent City | 19 | 3 | 5 | 16 | 9 | 6 | 7 | 10 | 29 | 28 | 27 | 39 | 1 | 1 | | 1 |
| | Dana Point | | | | | 3 | 8 | 1 | 5 | 22 | 21 | 15 | 19 | | | | |
| | Eureka | 27 | 14 | 14 | 23 | 24 | 14 | 16 | 20 | 7 | 6 | 3 | 16 | 2 | 3 | 3 | 3 |
| | Fields Landing | | | | 5 | 1 | | | 2 | | | | 1 | | | | 1 |
| | Fort Bragg | 14 | 10 | 10 | 17 | 36 | 35 | 31 | 39 | 32 | 30 | 20 | 42 | | | | |
| | Long Beach | | | | | 1 | | | 1 | 3 | 4 | 2 | 5 | | | | |
| | Monterey | 5 | 2 | 2 | 4 | 13 | 4 | 1 | 6 | 20 | 16 | 14 | 31 | | | | |
| | Morro Bay | 9 | 11 | 8 | 11 | 4 | 2 | 1 | 3 | 75 | 42 | 46 | 74 | | | | |
| | Moss Landing | 15 | 15 | 13 | 14 | 38 | 27 | 25 | 33 | 25 | 25 | 18 | 42 | | | 1 | |
| | Newport Beach | | | | | 5 | 5 | 5 | 5 | 10 | 11 | 10 | 13 | | | | |
| | Oakland | | | | 0 | | | | | 1 | | | 0 | | | | |
| | Oceanside | 1 | | | 1 | 14 | | 3 | 7 | 25 | 11 | 14 | 17 | | | | |
| | Oth Del Norte cnty ports | | | | | | | | | | 5 | | 3 | | | | |
| | Oth Humboldt cnty ports | | | | 0 | | | | 0 | 7 | 5 | 6 | 7 | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oth Marin/Sonoma outer coast ports | 1 | 1 | 1 | 1 | | 1 | 1 | 0 | 4 | 5 | 4 | 5 |
| Oth Mendocino cnty ports | 2 | | | 1 | | 2 | 2 | 1 | 2 | 1 | 1 | 1 |
| Oth Monterey/Sta Cruz cnty ports | | | | | | | | | 13 | 11 | 9 | 16 |
| Oth Orange/LA cnty ports | | | | | 3 | 10 | 3 | 7 | 18 | 24 | 20 | 22 |
| Oth San Diego cnty ports | | | | | 6 | 6 | 3 | 4 | 20 | 25 | 12 | 26 |
| Oth San Luis Obispo cnty ports | | | | 0 | | | | | 4 | 3 | 1 | 10 |
| Oth SFBay/San Mateo cnty ports | 3 | 2 | 2 | 3 | | | | 0 | 1 | | | 3 |
| Oth Ventura/Sta Barbara cnty ports | | | | | | | | | 2 | 4 | | 2 |
| Other/unknown CA ports | | | | | | | | | | | 1 | 0 |
| Oxnard | 2 | | 1 | 3 | 4 | 6 | 6 | 5 | 25 | 26 | 24 | 40 |
| Point Arena | | | | | | | | 0 | 7 | 5 | 4 | 11 |
| Point Reyes | | | | | 2 | 2 | | 1 | | 1 | | 0 |
| Port Hueneme | 3 | | | 2 | | | | | | 1 | 1 | 2 |
| Princeton | 12 | 13 | 11 | 13 | 6 | 4 | 4 | 7 | 20 | 18 | 19 | 36 |
| Richmond | | | | | | | | 0 | 2 | | | 2 |
| San Diego | | | | 0 | 3 | 1 | | 3 | 7 | 8 | 5 | 17 |
| San Francisco | 12 | 10 | 16 | 17 | 15 | 14 | 3 | 13 | 16 | 13 | 10 | 25 |
| San Pedro | 2 | | | 1 | | 1 | | 1 | 17 | 11 | 7 | 19 |
| Santa Barbara | 16 | 5 | 1 | 12 | | | | | 46 | 34 | 25 | 57 |
| Santa Cruz | 6 | 3 | 3 | 5 | 9 | 3 | 4 | 9 | 21 | 25 | 17 | 21 |
| Sausalito | | | | | | | | | | | | 0 |
| Terminal Island | 2 | | | 2 | 6 | 5 | 3 | 4 | 20 | 21 | 14 | 26 |
| Tomales Bay | | | | 0 | | | | | 1 | | | 0 |
| Trinidad | | 1 | | 0 | | | | | 3 | 5 | 5 | 7 |
| Ventura | 14 | 3 | 1 | 10 | 1 | 1 | | 1 | 10 | 13 | 3 | 19 |
| Willmington | | | | | | | | | 1 | 2 | 3 | 2 |

## Table A.3-5. Number of Dealers by Port for 2003-05 and Five Year Average

| State | Port | 2003 | 2004 | 2005 | 2000-2004 Average |
|---|---|---|---|---|---|
| **WASHINGTON** | | | | | |
| | Anacortes | 17 | 17 | 19 | 17 |
| | Blaine | 13 | 11 | 11 | 10 |
| | Bodega Bay | 85 | 80 | 53 | 79 |
| | Brookings | 33 | 26 | 20 | 27 |
| | Copalis Beach | 1 | | | 1 |
| | Everett | 13 | 13 | 8 | 11 |
| | Friday Harbor | 9 | 8 | 6 | 7 |
| | Gearhart/Seaside | | 3 | 4 | 2 |
| | Grays Harbor | 5 | 3 | 2 | 5 |
| | Ilwaco/Chinook | 26 | 16 | 16 | 20 |
| | La Conner | 8 | 6 | 6 | 7 |
| | La Push | 3 | 3 | 2 | 3 |
| | Neah Bay | 5 | 6 | 6 | 5 |
| | Oth No Puget Snd ports | 10 | 8 | 9 | 9 |
| | Oth So Puget Snd ports | 4 | 4 | 2 | 4 |
| | Oth WA coastal ports | 4 | 3 | 3 | 4 |
| | Other/unknown WA | 1 | | 3 | 2 |
| | Other Col R ports | 18 | 15 | 16 | 16 |
| | Port Angeles | 6 | 6 | 5 | 7 |
| | Seattle | 34 | 22 | 22 | 30 |
| | Sequim | 3 | 2 | 4 | 4 |
| | Shelton | 1 | 1 | 2 | 2 |
| | Tacoma | 14 | 15 | 10 | 16 |
| | Westport | 49 | 48 | 45 | 39 |
| | Willapa Bay | 22 | 16 | 15 | 19 |
| **OREGON** | | | | | |
| | Astoria | 29 | 37 | 26 | 29 |
| | Bandon | 10 | 8 | 3 | 11 |
| | Bellingham Bay | 38 | 42 | 34 | 34 |
| | Cannon Beach | 3 | 2 | 3 | 3 |
| | Coos Bay | 50 | 45 | 40 | 46 |
| | Depoe Bay | 11 | 18 | 15 | 13 |
| | Florence | 24 | 16 | 14 | 20 |

| | | | | |
|---|---|---|---|---|
| Gold Beach | 9 | 6 | 4 | 8 |
| Nehalem Bay | 1 | 1 | 1 | 2 |
| Netarts Bay | | | | |
| Newport | 90 | 67 | 69 | 73 |
| Port Orford | 13 | 15 | 12 | 12 |
| Pseudo port code for Col R | 32 | 28 | 24 | 26 |
| Siletz Bay | | | | |
| Tillamook/Garibaldi | 29 | 26 | 27 | 31 |
| Waldport | 7 | 7 | 5 | 7 |
| Winchester Bay | 26 | 27 | 23 | 25 |
| Yachats | | 1 | 1 | |
| **CALIFORNIA** | | | | |
| Alameda | 3 | 4 | 4 | 7 |
| Albion | 8 | 6 | 5 | 9 |
| Avila | 22 | 28 | 16 | 27 |
| Berkeley | 23 | 22 | 21 | 27 |
| Crescent City | 30 | 31 | 20 | 32 |
| Dana Point | 26 | 26 | 25 | 27 |
| Eureka | 35 | 33 | 21 | 36 |
| Fields Landing | 1 | 4 | 1 | 3 |
| Fort Bragg | 55 | 45 | 42 | 47 |
| Long Beach | 15 | 17 | 9 | 18 |
| Monterey | 27 | 23 | 18 | 25 |
| Morro Bay | 44 | 45 | 44 | 54 |
| Moss Landing | 50 | 49 | 37 | 55 |
| Newport Beach | 20 | 21 | 16 | 23 |
| Oakland | 4 | 3 | 1 | 6 |
| Oceanside | 20 | 14 | 14 | 21 |
| Olympia | 2 | | 2 | 2 |
| Oth Del Norte cnty ports | | 7 | | 2 |
| Oth Humboldt cnty ports | 21 | 20 | 16 | 15 |
| Oth Marin/Sonoma outer coast ports | 23 | 23 | 16 | 22 |
| Oth Mendocino cnty ports | 15 | 8 | 6 | 9 |
| Oth Monterey/Sta Cruz cnty ports | 8 | 10 | 6 | 9 |
| Oth Orange/LA cnty ports | 43 | 40 | 34 | 46 |
| Oth San Diego cnty ports | 46 | 44 | 32 | 43 |
| Oth San Luis Obispo cnty ports | 6 | 2 | 2 | 6 |

| | | | | |
|---|---|---|---|---|
| Oth SFBay/San Mateo cnty ports | 27 | 23 | 17 | 27 |
| Other/unknown CA ports | 7 | 8 | 6 | 9 |
| Oth Ventura/Sta Barbara cnty ports | 4 | 7 | 1 | 4 |
| Oxnard | 62 | 62 | 47 | 66 |
| Pacific City | 9 | 15 | 11 | 8 |
| Point Arena | 24 | 19 | 16 | 18 |
| Point Reyes | 4 | 4 | 3 | 4 |
| Port Hueneme | 16 | 17 | 14 | 20 |
| Princeton | 77 | 95 | 71 | 91 |
| Pt Townsend | 9 | 7 | 6 | 9 |
| Richmond | 20 | 15 | 9 | 15 |
| Salmon River | | | | |
| San Diego | 37 | 41 | 28 | 43 |
| San Francisco | 80 | 62 | 48 | 73 |
| San Pedro | 47 | 53 | 38 | 56 |
| Santa Barbara | 84 | 68 | 51 | 81 |
| Santa Cruz | 41 | 38 | 38 | 39 |
| Sausalito | 8 | 8 | 7 | 11 |
| Terminal Island | 45 | 47 | 35 | 53 |
| Tomales Bay | 5 | 3 | 2 | 4 |
| Trinidad | 16 | 12 | 12 | 13 |
| Ventura | 53 | 58 | 29 | 61 |
| Willmington | 7 | 6 | 9 | 6 |

## Table A.3-6. Dealers by Port and Sector for 2003-05 and Five Year Average

| | | Non-Whiting Groundfish Trawl | | | | Fixed Gear - Sablefish | | | | Fixed Gear - Pot and H&L Rockfish and Lingcod | | | | Whiting_trawl | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| State | Port | 2003 | 2004 | 2005 | 2000-04 Avg | 2003 | 2004 | 2005 | 2000-04 Avg | 2003 | 2004 | 2005 | 2000-04 Avg | 2003 | 2004 | 2005 | 2000-04 Avg |
| WASHINGTON | | | | | | | | | | | | | | | | | |
| | Anacortes | 0 | 0 | 0 | 0 | | | | | | | | | | | | |
| | Bellingham Bay | 2 | 2 | 2 | 2 | 3 | 5 | 2 | 4 | 3 | 3 | 2 | 3 | | | | |
| | Blaine | 2 | 1 | 2 | 1 | | | | | | | | | | 1 | | |
| | Copalis Beach | | | | | | | | | | | | | | | | |
| | Everett | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | |
| | Friday Harbor | 0 | 0 | 0 | 0 | | | | | | | | | | | | |
| | Grays Harbor | 0 | 1 | 0 | 0 | 1 | 1 | | 1 | | | | | | | | |
| | Ilwaco/Chinook | 0 | 0 | 0 | 1 | 7 | 6 | 5 | 5 | 2 | 3 | 4 | 2 | 1 | 1 | 1 | 1 |
| | La Conner | 0 | 0 | 0 | 0 | | | | | | | | | | | | |
| | La Push | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | | | | 1 | | | | |
| | Neah Bay | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | | | | |
| | Olympia | 0 | | 0 | 0 | | | | | | | | | | | | |
| | Oth No Puget Snd ports | 0 | 0 | 0 | 0 | | | | | | | | | | | | |
| | Oth So Puget Snd ports | 0 | 0 | 0 | 0 | | | | | | | | | | | | |
| | Oth WA coastal ports | 0 | 0 | 0 | 0 | | | | | | | | | | | | |
| | Other Col R ports | 0 | 0 | 0 | 0 | | | 1 | | | | | | | | | |
| | Other/unknown WA | 0 | | 0 | 0 | | | | | | | | | | | | |
| | Port Angeles | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | | | | |
| | Pt Townsend | 0 | 0 | 0 | 0 | 1 | | 1 | | | | | | | | | |
| | Seattle | 0 | 0 | 0 | 1 | 3 | | 2 | 3 | | | | 1 | | | | |
| | Sequim | 0 | 0 | 0 | 0 | | | | | | | | | | | | |
| | Shelton | 0 | 0 | 0 | 0 | | | | | | | | | | | | |
| | Tacoma | 0 | 0 | 0 | 0 | | | | | | | | | | | | |
| | Westport | 2 | 2 | 1 | 2 | 7 | 8 | 5 | 6 | | | 1 | 1 | 1 | 2 | 1 | 1 |
| | Willapa Bay | 0 | 0 | 0 | 0 | 2 | 2 | 1 | 2 | | | 1 | | | | | |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **OREGON** | | | | | | | | | | | | | | | | |
| | Astoria | 2 | 3 | 2 | 4 | 7 | 10 | 5 | 7 | 2 | 2 | 2 | 3 | 2 | 1 | 1 | 2 |
| | Bandon | 0 | 0 | 0 | 0 | 1 | 1 | | | 1 | 1 | 2 | 2 | | | | |
| | Brookings | 3 | 3 | 3 | 5 | 3 | 2 | 2 | 2 | 11 | 10 | 11 | 10 | | | | |
| | Cannon Beach | | | | | | | | | | | | | | | | |
| | Coos Bay | 9 | 4 | 6 | 6 | 10 | 6 | 8 | 7 | 4 | 5 | 9 | 6 | 3 | 1 | 1 | 2 |
| | Depoe Bay | 0 | 0 | 0 | 0 | | | | 1 | 3 | 5 | 3 | 5 | | | | |
| | Florence | 1 | 1 | 0 | 1 | 2 | | | 1 | | 1 | | 1 | | | | |
| | Gearhart/Seaside | | | | | | | | | | | | | | | | |
| | Gold Beach | 0 | 0 | 0 | 0 | 1 | | 2 | | 7 | 5 | 3 | 7 | | | | |
| | Nehalem Bay | | | | | | | | | | | | | | | | |
| | Newport | 2 | 3 | 4 | 3 | 14 | 18 | 14 | 14 | 5 | 9 | 8 | 10 | 3 | 3 | 3 | 3 |
| | Pacific City | | | | | | | | | 7 | 11 | 6 | 6 | | | | |
| | Port Orford | 0 | 0 | 0 | 0 | 2 | 3 | 2 | 3 | 4 | 4 | 3 | 4 | | | | |
| | Salmon River | | | | | | | | | | | | | | | | |
| | Tillamook/Garibaldi | 1 | 3 | 2 | 2 | 4 | 5 | 3 | 3 | 8 | 8 | 8 | 10 | | | | |
| | Winchester Bay | 0 | 0 | 1 | 0 | 5 | 2 | 3 | 2 | | | 2 | 2 | | | | |
| **CALIFORNIA** | | | | | | | | | | | | | | | | | |
| | Alameda | 0 | 0 | 0 | 0 | | | | | | | | 1 | | | | |
| | Albion | 0 | 0 | 0 | 0 | 1 | | | | 3 | 3 | 2 | 4 | | | | |
| | Avila | 3 | 4 | 4 | 4 | 1 | 1 | 1 | 1 | 14 | 14 | 7 | 14 | | | | |
| | Berkeley | 0 | 0 | 0 | 1 | | 1 | | 1 | 5 | 4 | 6 | 8 | | | | |
| | Bodega Bay | 3 | 3 | 0 | 4 | 3 | | 1 | 2 | 11 | 16 | 12 | 19 | | | | |
| | Crescent City | 4 | 1 | 2 | 4 | 6 | 4 | 3 | 4 | 11 | 12 | 6 | 12 | 1 | 1 | | 1 |
| | Dana Point | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 2 | 4 | 7 | 3 | 8 | | | | |
| | Eureka | 2 | 2 | 2 | 3 | 5 | 2 | 2 | 5 | 9 | 6 | 4 | 10 | 1 | 1 | 1 | 1 |
| | Fields Landing | 0 | 0 | 0 | 0 | 1 | | | 1 | | | | | | | | |
| | Fort Bragg | 2 | 2 | 2 | 4 | 6 | 5 | 5 | 5 | 9 | 16 | 7 | 13 | | | | |
| | Long Beach | 0 | 0 | 0 | 0 | 2 | | | 1 | 4 | 7 | 3 | 6 | | | | |
| | Monterey | 4 | 2 | 1 | 3 | 5 | 3 | 1 | 4 | 9 | 6 | 9 | 11 | | | | |
| | Morro Bay | 5 | 5 | 6 | 6 | 4 | 2 | 1 | 3 | 15 | 14 | 15 | 18 | | | | |
| | Moss Landing | 10 | 13 | 9 | 11 | 6 | 6 | 3 | 7 | 8 | 6 | 4 | 9 | | | 1 | |
| | Newport Beach | 0 | 0 | 0 | 0 | 3 | 2 | 2 | 2 | 6 | 8 | 5 | 7 | | | | |
| | Oakland | 0 | 0 | 0 | 0 | | | | | 1 | | | 1 | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oceanside | 1 | 0 | 0 | 0 | 1 | | 1 | 1 | 5 | 4 | 3 | 7 |
| Oth Del Norte cnty ports | | | | | | | | | | 3 | | 2 |
| Oth Humboldt cnty ports | 0 | 0 | 0 | 0 | | | | | 6 | 3 | 5 | 5 |
| Oth Marin/Sonoma outer coast ports | 1 | 1 | 1 | 1 | | 1 | 1 | | 5 | 2 | 3 | 4 |
| Oth Mendocino cnty ports | 1 | 0 | 0 | 1 | | 2 | 1 | 1 | 2 | 1 | 1 | 1 |
| Oth Monterey/Sta Cruz cnty ports | 0 | 0 | 0 | 0 | | | | | 7 | 8 | 6 | 8 |
| Oth Orange/LA cnty ports | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 3 | 5 | 5 | 4 | 10 |
| Oth San Diego cnty ports | 0 | 0 | 0 | 0 | 9 | 6 | 3 | 6 | 17 | 21 | 12 | 17 |
| Oth San Luis Obispo cnty ports | 0 | 0 | 0 | 0 | | | | | 2 | 1 | 1 | 3 |
| Oth SFBay/San Mateo cnty ports | 3 | 2 | 2 | 3 | | | | | 1 | | | 3 |
| Oth Ventura/Sta Barbara cnty ports | 0 | 0 | 0 | 0 | | | | | 1 | 3 | | 1 |
| Other/unknown CA ports | 0 | 0 | 0 | 0 | | | | | | | 1 | |
| Oxnard | 2 | 0 | 1 | 3 | 4 | 7 | 2 | 5 | 23 | 21 | 16 | 26 |
| Point Arena | | | | | | | | | 4 | 6 | 5 | 4 |
| Point Reyes | 0 | 0 | 0 | 0 | 2 | 1 | | 1 | | 1 | | |
| Port Hueneme | 2 | 0 | 0 | 1 | | | | | | 1 | 1 | 2 |
| Princeton | 8 | 11 | 9 | 10 | 6 | 5 | 3 | 5 | 14 | 12 | 16 | 22 |
| Richmond | 0 | 0 | 0 | 0 | | | | | 2 | | | 2 |
| San Diego | 0 | 0 | 0 | 0 | 3 | 1 | | 3 | 8 | 10 | 3 | 14 |
| San Francisco | 11 | 10 | 8 | 11 | 9 | 10 | 5 | 8 | 17 | 13 | 10 | 22 |
| San Pedro | 3 | 0 | 0 | 1 | | 1 | | 1 | 13 | 9 | 10 | 12 |
| Santa Barbara | 5 | 6 | 1 | 6 | | | | | 26 | 22 | 17 | 25 |
| Santa Cruz | 6 | 4 | 6 | 6 | 4 | 2 | 2 | 3 | 12 | 13 | 10 | 11 |
| Sausalito | 0 | 0 | 0 | 0 | | | | | | | | |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Terminal Island | 2 | 0 | 0 | 1 | 5 | 2 | 1 | 4 | 14 | 21 | 9 | 19 | | | | |
| | Tomales Bay | 0 | 0 | 0 | 0 | | | | | 1 | | | | | | | |
| | Trinidad | 0 | 1 | 0 | 0 | | | | | 6 | 6 | 6 | 6 | | | | |
| | Ventura | 7 | 1 | 1 | 6 | 1 | 1 | | 1 | 10 | 11 | 1 | 13 | | | | |
| | Willmington | 0 | 0 | 0 | 0 | | | | | 1 | 4 | 3 | 2 | | | | |

## Table A.3-7. Number of Trips by Port and Groundfish Fishery for 2000-04 Average and 2005

| | | Non-Whiting Grd trawl | | | | Fixed-Gear | | | | Whiting trawl | | | | Groundfish Total | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| State | Port Name | 2000-04 | 2003 | 2004 | 2005 | 2000-04 | 2003 | 2004 | 2005 | 2000-04 | 2003 | 2004 | 2005 | 2000-04 | 2003 | 2004 | 2005 |
| **WASHINGTON** | | | | | | | | | | | | | | | | | |
| | Anacortes | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Bellingham Bay | 160 | 150 | 134 | 103 | 79 | 122 | 94 | 77 | 0 | 0 | 0 | 0 | 239 | 272 | 228 | 180 |
| | Blaine | 402 | 382 | 247 | 207 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 403 | 382 | 248 | 207 |
| | Copalis Beach | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Everett | 0 | 0 | 0 | 0 | 5 | 8 | 12 | 9 | 0 | 0 | 0 | 0 | 5 | 8 | 12 | 9 |
| | Friday Harbor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Grays Harbor | 0 | 0 | 1 | 0 | 6 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 7 | 5 | 2 | 0 |
| | Ilwaco/Chinook | 13 | 0 | 0 | 0 | 77 | 130 | 89 | 262 | 30 | 47 | 37 | 84 | 119 | 177 | 126 | 346 |
| | La Conner | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | La Push | 0 | 0 | 0 | 0 | 162 | 241 | 247 | 153 | 0 | 0 | 0 | 0 | 162 | 241 | 247 | 153 |
| | Neah Bay | 272 | 502 | 229 | 313 | 49 | 195 | 61 | 59 | 0 | 0 | 0 | 0 | 321 | 697 | 290 | 372 |
| | Olympia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Port Angeles | 164 | 0 | 122 | 61 | 266 | 0 | 0 | 115 | 0 | 0 | 0 | 0 | 430 | 0 | 122 | 176 |
| | Pt Townsend | 1 | 0 | 0 | 0 | 10 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 1 |
| | Seattle | 2 | 0 | 0 | 0 | 12 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 2 |
| | Sequim | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Shelton | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Tacoma | 0 | 0 | 0 | 0 | 0 | 15 | 68 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 68 | 0 |
| | Westport | 55 | 42 | 45 | 45 | 174 | 49 | 0 | 129 | 145 | 97 | 175 | 200 | 374 | 188 | 220 | 374 |
| | Willapa Bay | 0 | 0 | 0 | 0 | 3 | 23 | 0 | 2 | 0 | 0 | 0 | 0 | 3 | 23 | 0 | 2 |
| | Oth No Puget Snd ports | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Oth So Puget Snd ports | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Oth WA coastal ports | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Other Col R ports | 0 | 0 | 0 | 0 | 0 | 200 | 163 | 3 | 0 | 0 | 0 | 0 | 0 | 200 | 163 | 3 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Other/unknown WA | 0 | 0 | 0 | 0 | 1 | 4 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 3 | 0 |
| | WA Total | 1,070 | 1076 | 778 | 729 | 843 | 992 | 738 | 812 | 176 | 144 | 213 | 284 | 2,089 | 2,212 | 1,729 | 1,825 |
| **OREGON** | | | | | | | | | | | | | | | | | |
| | Astoria | 550 | 486 | 443 | 434 | 203 | 210 | 121 | 172 | 218 | 162 | 183 | 200 | 971 | 858 | 747 | 806 |
| | Bandon | 0 | 0 | 0 | 0 | 2 | 18 | 17 | 18 | 0 | 0 | 0 | 0 | 2 | 18 | 17 | 18 |
| | Brookings | 127 | 125 | 47 | 54 | 13 | 407 | 608 | 460 | 0 | 0 | 0 | 0 | 140 | 532 | 655 | 514 |
| | Cannon Beach | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Coos Bay | 421 | 420 | 279 | 253 | 125 | 152 | 114 | 247 | 56 | 52 | 103 | 85 | 603 | 624 | 496 | 585 |
| | Depoe Bay | 0 | 0 | 0 | 0 | 1 | 26 | 26 | 12 | 0 | 0 | 0 | 0 | 1 | 26 | 26 | 12 |
| | Florence | 7 | 12 | 6 | 0 | 17 | 18 | 2 | 0 | 0 | 0 | 0 | 0 | 24 | 30 | 8 | 0 |
| | Gearhart/Seaside | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Gold Beach | 0 | 0 | 0 | 0 | 1 | 981 | 713 | 661 | 0 | 0 | 0 | 0 | 1 | 981 | 713 | 661 |
| | Nehalem Bay | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Newport | 345 | 305 | 223 | 220 | 148 | 243 | 226 | 178 | 378 | 287 | 480 | 502 | 871 | 835 | 929 | 900 |
| | Pacific City | 0 | 0 | 0 | 0 | 101 | 239 | 264 | 190 | 0 | 0 | 0 | 0 | 101 | 239 | 264 | 0 |
| | Port Orford | 0 | 0 | 0 | 0 | 160 | 1,168 | 1,116 | 997 | 0 | 0 | 0 | 0 | 160 | 1,168 | 1,116 | 997 |
| | Salmon River | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Tillamook/Garibaldi | 34 | 27 | 17 | 5 | 7 | 401 | 378 | 250 | 0 | 0 | 0 | 0 | 41 | 428 | 395 | 255 |
| | Winchester Bay | 0 | 0 | 0 | 1 | 11 | 14 | 3 | 11 | 0 | 0 | 0 | 0 | 11 | 14 | 3 | 12 |
| | OR Total | 1,484 | 1375 | 1015 | 967 | 687 | 3,877 | 3,588 | 3,196 | 653 | 501 | 766 | 787 | 2,824 | 5,753 | 5,369 | 4,950 |
| **CALIFORNIA** | | | | | | | | | | | | | | | | | |
| | Alameda | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Albion | 0 | 0 | 0 | 0 | 0 | 36 | 104 | 82 | 0 | 0 | 0 | 0 | 0 | 36 | 104 | 82 |
| | Avila | 145 | 132 | 76 | 29 | 1 | 791 | 951 | 688 | 0 | 0 | 0 | 0 | 146 | 923 | 1,027 | 717 |
| | Berkeley | 1 | 0 | 0 | 0 | 1 | 36 | 27 | 33 | 0 | 0 | 0 | 0 | 2 | 36 | 27 | 33 |
| | Bodega Bay | 46 | 60 | 6 | 0 | 6 | 130 | 183 | 111 | 0 | 0 | 0 | 0 | 52 | 190 | 189 | 111 |
| | Crescent City | 266 | 221 | 56 | 81 | 86 | 570 | 559 | 523 | 22 | 1 | 32 | 0 | 374 | 792 | 647 | 604 |
| | Dana Point | 0 | 0 | 0 | 0 | 23 | 196 | 307 | 58 | 0 | 0 | 0 | 0 | 23 | 196 | 307 | 58 |
| | Eureka | 404 | 373 | 208 | 204 | 189 | 153 | 69 | 72 | 44 | 42 | 80 | 64 | 637 | 568 | 357 | 340 |
| | Fields Landing | 62 | 0 | 0 | 0 | 21 | 2 | 0 | 0 | 6 | 0 | 0 | 0 | 89 | 2 | 0 | 0 |
| | Fort Bragg | 264 | 214 | 143 | 142 | 704 | 819 | 983 | 703 | 0 | 0 | 0 | 0 | 968 | 1,033 | 1,126 | 845 |
| | Long Beach | 0 | 0 | 0 | 0 | 1 | 45 | 24 | 17 | 0 | 0 | 0 | 0 | 1 | 45 | 24 | 17 |
| | Monterey | 79 | 68 | 110 | 34 | 93 | 373 | 395 | 195 | 0 | 0 | 0 | 0 | 172 | 441 | 505 | 229 |
| | Morro Bay | 45 | 31 | 68 | 71 | 17 | 1,084 | 868 | 598 | 0 | 0 | 0 | 0 | 61 | 1,115 | 936 | 669 |
| | Moss Landing | 302 | 364 | 387 | 295 | 572 | 811 | 588 | 353 | 0 | 0 | 0 | 1 | 874 | 1,175 | 975 | 649 |
| | Newport Beach | 0 | 0 | 0 | 0 | 267 | 488 | 480 | 303 | 0 | 0 | 0 | 0 | 267 | 488 | 480 | 303 |
| | Oakland | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| | Oceanside | 1 | 1 | 0 | 0 | 129 | 345 | 71 | 153 | 0 | 0 | 0 | 0 | 130 | 346 | 71 | 153 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oxnard | 12 | 2 | 0 | 1 | 29 | 256 | 301 | 215 | 0 | 0 | 0 | 0 | 42 | 258 | 301 | 216 |
| Point Arena | 0 | 0 | 0 | 0 | 0 | 27 | 66 | 50 | 0 | 0 | 0 | 0 | 0 | 27 | 66 | 50 |
| Point Reyes | 0 | 0 | 0 | 0 | 5 | 16 | 6 | 0 | 0 | 0 | 0 | 0 | 5 | 16 | 6 | 0 |
| Port Hueneme | 125 | 114 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 125 | 114 | 1 | 1 |
| Princeton | 384 | 392 | 395 | 456 | 27 | 260 | 278 | 228 | 0 | 0 | 0 | 0 | 411 | 652 | 673 | 684 |
| Richmond | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 |
| San Diego | 0 | 0 | 0 | 0 | 15 | 99 | 116 | 52 | 0 | 0 | 0 | 0 | 15 | 99 | 116 | 52 |
| San Francisco | 257 | 183 | 200 | 213 | 82 | 223 | 197 | 148 | 0 | 0 | 0 | 0 | 338 | 406 | 397 | 361 |
| San Pedro | 1 | 3 | 0 | 0 | 9 | 49 | 65 | 49 | 0 | 0 | 0 | 0 | 10 | 52 | 65 | 49 |
| Santa Barbara | 305 | 268 | 18 | 1 | 0 | 211 | 199 | 95 | 0 | 0 | 0 | 0 | 306 | 479 | 217 | 96 |
| Santa Cruz | 117 | 64 | 62 | 123 | 65 | 165 | 214 | 133 | 0 | 0 | 0 | 0 | 182 | 229 | 276 | 256 |
| Sausalito | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Terminal Island | 11 | 2 | 0 | 0 | 41 | 144 | 194 | 131 | 0 | 0 | 0 | 0 | 52 | 146 | 194 | 131 |
| Tomales Bay | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Trinidad | 0 | 0 | 1 | 0 | 0 | 73 | 83 | 103 | 0 | 0 | 0 | 0 | 0 | 73 | 84 | 103 |
| Ventura | 109 | 109 | 11 | 2 | 6 | 56 | 76 | 4 | 0 | 0 | 0 | 0 | 115 | 165 | 87 | 6 |
| Willmington | 0 | 0 | 0 | 0 | 0 | 42 | 53 | 42 | 0 | 0 | 0 | 0 | 0 | 42 | 53 | 42 |
| Oth Del Norte cnty ports | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 |
| Oth Humboldt cnty ports | 0 | 0 | 0 | 0 | 0 | 57 | 68 | 18 | 0 | 0 | 0 | 0 | 1 | 57 | 68 | 18 |
| Oth Marin/Sonoma outer coast ports | 1 | 2 | 1 | 1 | 0 | 19 | 33 | 18 | 0 | 0 | 0 | 0 | 1 | 21 | 34 | 19 |
| Oth Mendocino cnty ports | 1 | 2 | 0 | 0 | 1 | 2 | 7 | 3 | 0 | 0 | 0 | 0 | 2 | 4 | 7 | 3 |
| Oth Monterey/Sta Cruz cnty ports | 0 | 0 | 0 | 0 | 0 | 75 | 81 | 35 | 0 | 0 | 0 | 0 | 0 | 75 | 81 | 35 |
| Oth Orange/LA cnty ports | 0 | 0 | 0 | 0 | 37 | 173 | 314 | 317 | 0 | 0 | 0 | 0 | 37 | 173 | 314 | 317 |
| Oth San Diego cnty ports | 0 | 0 | 0 | 0 | 137 | 361 | 444 | 290 | 0 | 0 | 0 | 0 | 137 | 361 | 444 | 290 |
| Oth San Luis Obispo cnty ports | 0 | 0 | 0 | 0 | 0 | 5 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 5 | 3 | 1 |
| Oth SFBay/San Mateo cnty ports | 16 | 4 | 2 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 5 | 2 | 2 |
| Oth Ventura/Sta Barbara cnty ports | 0 | 0 | 0 | 0 | 0 | 3 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 5 | 0 |
| Other/unknown CA ports | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| CA Total | 2,953 | 2609 | 1744 | 1,655 | 2,567 | 8,207 | 8,421 | 5,823 | 73 | 43 | 112 | 65 | 5,593 | 10,859 | 10,277 | 7,543 |
| **Grand Total** | **5,507** | **5,060** | **3,537** | **3,351** | **4,097** | **13,076** | **12,747** | **9,831** | **901** | **688** | **1,091** | **1,136** | **10,506** | **18,824** | **17,375** | **14,318** |

## Table A.3-8. Landings (Round Weight, lbs) by Port and Fishing Sector for 2000-04 Average and 2005

| | | Non-Whiting Grd trawl | | | | Fixed-Gear | | | | Whiting trawl | | | | Groundfish Total | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| State | Port Name | 2000-04 | 2003 | 2004 | 2005 | 2000-04 | 2003 | 2004 | 2005 | 2000-04 | 2003 | 2004 | 2005 | 2000-04 | 2003 | 2004 | 2005 |
| **WASHINGTON** | | | | | | | | | | | | | | | | | |
| | Anacortes | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Bellingham Bay | 6,970 | 6,918 | 7,145 | 3,166 | 2,227 | 0 | 0 | 1,976 | 0 | 2,175 | 2,199 | 0 | 9,197 | 9,093 | 9,344 | 5,142 |
| | Blaine | 4,329 | 3,732 | 4,506 | 1,972 | 1 | 0 | 162 | 0 | 69 | 0 | 0 | 0 | 4,399 | 3,732 | 4,668 | 1,972 |
| | Copalis Beach | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| | Everett | 0 | 0 | 0 | 0 | 101 | 0 | 0 | 189 | 0 | 111 | 172 | 0 | 101 | 111 | 172 | 189 |
| | Friday Harbor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Grays Harbor | 4 | 0 | 19 | 0 | 4 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 8 | 4 | 19 | 0 |
| | Ilwaco/Chinook | 275 | 0 | 0 | 0 | 124 | 5,072 | 7,168 | 336 | 4,106 | 355 | 105 | 17,481 | 4,504 | 5,427 | 7,273 | 17,817 |
| | La Conner | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 |
| | La Push | 0 | 0 | 0 | 0 | 131 | 0 | 0 | 194 | 0 | 145 | 214 | 0 | 131 | 145 | 214 | 194 |
| | Neah Bay | 1,448 | 2,169 | 759 | 1,182 | 92 | 0 | 0 | 73 | 0 | 256 | 164 | 0 | 1,540 | 2,425 | 922 | 1,256 |
| | Olympia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Port Angeles | 747 | 0 | 463 | 238 | 308 | 0 | 0 | 168 | 0 | 51 | 217 | 0 | 1,056 | 51 | 680 | 406 |
| | Pt Townsend | 5 | 0 | 0 | 0 | 12 | 0 | 0 | 1 | 0 | 29 | 0 | 0 | 17 | 29 | 0 | 1 |
| | Seattle | 20 | 0 | 0 | 0 | 160 | 0 | 0 | 50 | 0 | 125 | 0 | 0 | 180 | 125 | 0 | 50 |
| | Sequim | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Shelton | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Tacoma | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Westport | 1,091 | 745 | 764 | 631 | 387 | 23,767 | 50,139 | 592 | 32,918 | 494 | 505 | 58,243 | 34,396 | 25,006 | 51,407 | 59,466 |
| | Willapa Bay | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 2 | 3 | 0 | 2 | 2 | 3 | 1 |
| | Oth No Pdt Snd ports | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Oth So Pdt Snd ports | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Oth WA coastal ports | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Other Col R ports | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 |
| | Other/unknown WA | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 |
| | WA Total | 14,894 | 13,563 | 13,656 | 7,190 | 3,560 | 28,838 | 57,469 | 3,595 | 37,093 | 3,748 | 3,578 | 75,724 | 55,546 | 46,150 | 74,703 | 86,509 |
| **OREGON** | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Astoria | 12,084 | 9,943 | 11,746 | 11,891 | 657 | 32,080 | 35,411 | 649 | 42,369 | 514 | 518 | 37,979 | 55,110 | 42,537 | 47,675 | 50,519 |
| | Bandon | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 5 | 4 | 0 | 2 | 5 | 4 | 2 |
| | Brookings | 1,764 | 1,974 | 1,072 | 1,356 | 99 | 0 | 0 | 83 | 6 | 141 | 86 | 0 | 1,869 | 2,115 | 1,158 | 1,438 |
| | Cannon Beach | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Coos Bay | 6,409 | 6,402 | 5,351 | 4,930 | 472 | 4,344 | 9,343 | 716 | 4,786 | 479 | 506 | 7,478 | 11,667 | 11,224 | 15,199 | 13,124 |
| | Depoe Bay | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 3 | 0 | 4 | 5 | 0 | 10 | 4 | 5 | 3 |
| | Florence | 39 | 55 | 32 | 0 | 106 | 0 | 0 | 0 | 0 | 96 | 0 | 0 | 145 | 150 | 32 | 0 |
| | Gearhart/Seaside | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Gold Beach | 0 | 0 | 0 | 0 | 131 | 0 | 0 | 94 | 0 | 122 | 108 | 0 | 131 | 122 | 108 | 94 |
| | Nehalem Bay | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Newport | 5,705 | 5,123 | 5,609 | 3,896 | 958 | 44,210 | 84,769 | 1,002 | 63,147 | 958 | 1,265 | 90,154 | 69,810 | 50,290 | 91,643 | 95,052 |
| | Pacific City | 0 | 0 | 0 | 0 | 41 | 0 | 0 | 43 | 0 | 52 | 53 | 0 | 41 | 52 | 53 | 43 |
| | Port Orford | 0 | 0 | 0 | 0 | 592 | 0 | 0 | 555 | 0 | 527 | 528 | 0 | 592 | 527 | 528 | 555 |
| | Salmon River | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Tillamook/Garibaldi | 174 | 114 | 71 | 14 | 77 | 0 | 0 | 44 | 0 | 100 | 87 | 0 | 251 | 214 | 158 | 57 |
| | Winchester Bay | 0 | 0 | 0 | 4 | 39 | 0 | 0 | 13 | 0 | 41 | 3 | 0 | 40 | 41 | 3 | 17 |
| | OR Total | 26,175 | 23,610 | 23,880 | 22,090 | 3,183 | 80,634 | 129,523 | 3,203 | 110,309 | 3,039 | 3,162 | 135,611 | 139,667 | 107,282 | 156,565 | 160,905 |
| **CALIFORNIA** | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Alameda | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Albion | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 7 | 0 | 7 | 12 | 0 | 8 | 7 | 12 | 7 |
| Avila | 1,122 | 1,549 | 986 | 3 | 81 | 0 | 0 | 75 | 0 | 83 | 102 | 0 | 1,203 | 1,632 | 1,087 | 79 |
| Berkeley | 7 | 0 | 0 | 0 | 5 | 0 | 0 | 2 | 0 | 2 | 3 | 0 | 12 | 2 | 3 | 2 |
| Bodega Bay | 422 | 445 | 57 | 0 | 58 | 0 | 0 | 18 | 0 | 14 | 30 | 0 | 480 | 459 | 87 | 18 |
| Crescent City | 2,257 | 1,905 | 1,066 | 1,282 | 332 | 42 | 3,447 | 288 | 2,993 | 326 | 280 | 0 | 5,581 | 2,273 | 4,793 | 1,570 |
| Dana Point | 0 | 0 | 0 | 0 | 56 | 0 | 0 | 24 | 0 | 74 | 134 | 0 | 56 | 74 | 134 | 24 |
| Eureka | 4,007 | 4,418 | 3,699 | 3,653 | 293 | 3,648 | 7,031 | 282 | 3,896 | 255 | 169 | 6,735 | 8,196 | 8,321 | 10,899 | 10,670 |
| Fields Landing | 726 | 0 | 0 | 0 | 22 | 0 | 0 | 0 | 379 | 42 | 0 | 0 | 1,127 | 42 | 0 | 0 |
| Fort Bragg | 3,592 | 3,030 | 2,903 | 2,737 | 516 | 0 | 0 | 419 | 0 | 483 | 656 | 0 | 4,108 | 3,513 | 3,559 | 3,156 |
| Long Beach | 0 | 0 | 0 | 0 | 31 | 0 | 0 | 3 | 0 | 52 | 19 | 0 | 31 | 52 | 19 | 3 |
| Monterey | 623 | 553 | 422 | 120 | 57 | 0 | 0 | 22 | 0 | 61 | 42 | 0 | 680 | 614 | 463 | 142 |
| Morro Bay | 339 | 254 | 777 | 873 | 151 | 0 | 0 | 69 | 0 | 161 | 112 | 0 | 491 | 415 | 890 | 942 |
| Moss Landing | 1,475 | 2,056 | 1,182 | 787 | 711 | 0 | 0 | 297 | 0 | 783 | 557 | 89 | 2,186 | 2,839 | 1,740 | 1,173 |
| Newport Beach | 0 | 0 | 0 | 0 | 112 | 0 | 0 | 43 | 0 | 133 | 84 | 0 | 112 | 133 | 84 | 43 |
| Oakland | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Oceanside | 0 | 0 | 0 | 0 | 116 | 0 | 0 | 79 | 0 | 152 | 23 | 0 | 116 | 153 | 23 | 79 |
| Oxnard | 5 | 0 | 0 | 1 | 265 | 0 | 0 | 169 | 0 | 212 | 263 | 0 | 270 | 212 | 263 | 169 |
| Point Arena | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 12 | 0 | 8 | 22 | 0 | 15 | 8 | 22 | 12 |
| Point Reyes | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 15 | 3 | 0 | 4 | 15 | 3 | 0 |
| Port Hueneme | 17 | 13 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 18 | 13 | 3 | 0 |
| Princeton | 1,093 | 763 | 708 | 490 | 71 | 0 | 0 | 45 | 0 | 64 | 56 | 0 | 1,164 | 827 | 764 | 535 |
| Richmond | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 1 | 3 | 0 | 0 |
| San Diego | 1 | 0 | 0 | 0 | 60 | 0 | 0 | 24 | 0 | 49 | 43 | 0 | 61 | 49 | 43 | 24 |
| San Francisco | 1,805 | 1,470 | 2,088 | 1,170 | 221 | 0 | 0 | 78 | 0 | 178 | 163 | 0 | 2,026 | 1,648 | 2,250 | 1,248 |
| San Pedro | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 10 | 0 | 12 | 14 | 0 | 19 | 12 | 14 | 10 |
| Santa Barbara | 41 | 26 | 12 | 0 | 99 | 0 | 0 | 40 | 0 | 80 | 69 | 0 | 140 | 106 | 81 | 40 |
| Santa Cruz | 48 | 15 | 14 | 32 | 39 | 0 | 0 | 16 | 0 | 40 | 31 | 0 | 87 | 55 | 45 | 48 |
| Sausalito | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Terminal Island | 1 | 0 | 0 | 0 | 56 | 0 | 0 | 46 | 0 | 30 | 57 | 0 | 58 | 30 | 57 | 46 |
| Tomales Bay | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Trinidad | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 19 | 0 | 9 | 9 | 0 | 12 | 9 | 9 | 19 |
| Ventura | 25 | 23 | 2 | 0 | 41 | 0 | 0 | 2 | 0 | 40 | 35 | 0 | 66 | 63 | 37 | 2 |
| Willmington | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 17 | 0 | 15 | 22 | 0 | 19 | 15 | 22 | 17 |
| Oth D Norte cnty ports | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 0 |
| Oth Humb cnty ports | 1 | 0 | 0 | 0 | 10 | 0 | 0 | 3 | 0 | 8 | 8 | 0 | 11 | 8 | 8 | 3 |
| Oth Marin/Sonoma outer coast ports | 0 | 0 | 1 | 1 | 4 | 0 | 0 | 3 | 0 | 3 | 5 | 0 | 4 | 3 | 6 | 4 |
| Oth Mend cnty ports | 5 | 15 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 3 | 0 | 6 | 15 | 3 | 2 |
| Oth Mont/S Cruz cnty pts | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 7 | 0 | 10 | 15 | 0 | 15 | 10 | 15 | 7 |
| Oth Oran/LA cnty pts | 0 | 0 | 0 | 0 | 76 | 0 | 0 | 149 | 0 | 92 | 143 | 0 | 76 | 92 | 143 | 149 |
| Oth S Diego cnty pts | 0 | 0 | 0 | 0 | 81 | 0 | 0 | 70 | 0 | 109 | 124 | 0 | 81 | 109 | 124 | 70 |
| Oth S L Ob cnty pts | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 6 | 1 | 1 | 0 |
| Oth SFBy/S Mat cnty pts | 5 | 16 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 16 | 0 | 1 |
| Oth Vent/Sta Brb cnty pts | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 |
| CA Total | 17,621 | 16,552 | 13,917 | 11,151 | 3,667 | 3,690 | 10,478 | 2,342 | 7,268 | 3,608 | 3,311 | 6,824 | 28,555 | 23,850 | 27,705 | 20,317 |
| Grand Total | 58,690 | 53,726 | 51,452 | 40,432 | 10,410 | 113,162 | 197,470 | 9,141 | 154,669 | 10,395 | 10,051 | 218,159 | 223,769 | 177,282 | 258,972 | 267,731 |

## A.4 Fishing Community Engagement, Dependence, Resilience and Identification of Potentially Vulnerable Communities

### *A.4.1 Introduction*

The purpose of this section is to present community specific information to help the Council develop rebuilding plans for overfished groundfish species. The Magnuson Stevens Act requires among other things that the time period for rebuilding an overfished species "be as short as possible, taking into account the status and biology of any overfished stocks of fish, the needs of fishing communities, recommendations by international organizations in which the United States participates, and the interaction of the overfished stock within the marine ecosystem;…"

Looking for concepts and methodological approaches, we have reviewed available literature that points towards using sets of indicators to characterize communities as "engaged", "dependent", "resilient", and "vulnerable", which all may be components of assessing the "needs of fishing communities". Our ability to apply suggested approaches is limited by available data and the context of the Pacific groundfish fishery. For example, few, if any of the studies reviewed, specifically address fishing communities that depend on recreational fishing as a source of income, jobs, or social "well being."

A literature review was used to help choose a methodological approach to identify "commercially engaged" communities, "commercially groundfish dependent" communities, "recreationally engaged" communities, communities with "low resilience" to change, and potentially "vulnerable" communities. (These terms are defined below.)

Below are a summary of reviewed literature and an analysis using socioeconomic indicators that may be useful for assessing the "needs of fishing communities".

### *A.4.2 Summary of literature review*

#### A.4.2.1 Types of literature reviewed

Several sources of literature were reviewed to collect information on methodologies used in other regions and industries to assess community engagement in and dependence on natural resources (fisheries and forestry) and community adaptability to change. Effort was made to review all relevant literature. Over thirty-three studies were reviewed. The most relevant studies have been summarized in Tables A.4-1 to A.4-5. The literature reviewed typically fell into one or more of the following categories:

- Studies offering general guidance in choosing indicators and indices
- Studies identifying key indicators potentially useful for tracking community engagement, dependence, resilience and resident well-being
- Studies determining engagement, dependence and/or resilience
- Studies identifying "communities of concern" or "areas of vulnerability"

The term "engagement" is used in the literature to describe a community's use of a resource (for example, fisheries). Most studies used the term "dependence" to mean use of a particular resource (for example, groundfish species), sometimes above a threshold level. The term "resilience" usually implied a community's adaptability to change.

#### A.4.2.2 Use of indicators and indices to help determine "dependence" and "resiliency"

Because there is no single agreed upon method for measuring engagement, dependence and resilience as defined above, research attempting to characterize engagement, dependence and/or resilience use various types of data as proxies. Literature sources summarized in Table A.4-1 describe several indicators and indices potentially useful in tracking engagement, dependence, resilience and sustainability of communities.

**Table A.4-11. Socioeconomic and cultural indicators**

| Author(s) | Key Indicators | Comments |
|---|---|---|
| Langdon-Pollock-PSMFC (forthcoming) | • Marine education programs<br>• Number of crew members and processor employees residing in a fishing community<br>• Reliance on other natural resources<br>• Changes in ownership over time<br>• Descriptions of support industries<br>• Commercially landed pounds and revenue<br>• Recreationally landed pounds and revenue<br>• Fishing related social groups and organizations<br>• Subsistence fisheries<br>• Number of vessel owners that reside in the community<br>• Number of vessel owners that land fish but do not reside in the community<br>• Adaption strategies<br>• Industry structure<br>• Training institutions<br>• Perceptions and descriptions of tourism<br>• Women's role in the fishing industries<br>• Processors and fishery support industries<br>• History of fishing industries | |
| General Fisheries Commission for the Mediterranean (2001) | National Indicators<br>• Gross consumption of fishing products per inhabitant<br>• Fish export/import commercial balance<br>• Fish employment ratios<br>• Fish coverage rates of national consumption<br>• Extraversion rate<br>• Fish contribution to the GNP<br>• Ratio harvesting value<br>• Ratio harvesting rate<br>Local Operating Unit Indicators<br>• Vessel physical productivity<br>• Capacity physical productivity<br>• Power physical productivity<br>• Per vessel hour physical productivity<br>• Capacity productivity<br>• Vessel productivity<br>• Power productivity<br>• Per vessel hour productivity<br>• Man physical productivity<br>• Man productivity<br>• Average wage<br>• Landing prices<br>• Invested capital<br>• Salary cost | Of a larger group of potential indicators, an advisory group determined that adequate information existed for only sixteen variables that were used to construct the indicators shown.<br><br>These results would be tracked over time to develop a better understanding of main socioeconomic trends within the Alboran Sea Mediterranean fisheries management unit. |

| | | |
|---|---|---|
| | • Opportunity cost<br>• Gross estimated profit<br>• Profit rate<br>• Gross added value | |
| Kusel, Fortmann (1991) | • Economic well-being (poverty, average income, income inequality)<br>• Health (work injuries)<br>• Social Pathology (rate of burglary)<br>• Capacity<br>• Economic importance of forestry sector<br>• Amount of public land<br>• Concentration of private timber land<br>• Economic importance of tourism<br>• Immigration | Well-being is reformulated in terms of Sen's concepts of capabilities (opportunities an individual has to choose from) and functioning (what (s)he succeeds in doing with the commodities at her command) coupled with an expanded conception of community which is used to explore the question of how communities develop and maintain the capacity to enhance their well-being and to defend their interests against outsiders.<br><br>*Study 1:* statistical analyses between indicators of well-being and measures of forest and use<br>*Study 2:* rapid rural appraisal of 7 forest communities to determine issues of local importance and to assess capacity to undertake action to address them<br>*Study 3 (v2):* evaluates the well-being of 3 forest communities in CA. |
| Northeast Fisheries Management Council (2003) | • *Size and demographic characteristics of the fishery workforce in the community*<br>• *Cultural issues*<br>- attitudes, beliefs, values of fishermen, their families, and their communities<br>• *Social structure and organization*<br>- the ability of communities to provide necessary social support and services to families<br>• *Non-economic social aspects*<br>- lifestyle, health, and safety issues<br>• *Historical dependence on fishery*<br>- reflected in the structure of fishing practices and income distribution | This SIA was framed by the following questions:<br>- Will standards, style, or pace of living change?<br>- Will cooperation and interaction patterns change?<br>- Will change be sudden or gradual?<br>- How does the proposed action fit with historical trends and participation in the fishery?<br>- Does the change fit with cultural or normative expectations of behavior in the fishery or community?<br>- How do fishermen and the community members view the alternatives? |
| Pollnac (2006) | o *Occupational attributes:*<br>o Annual rounds<br>o Fishing units and gears<br>o Cost of entry<br>o Crew structure<br>o Occupational mobility<br>o Productivity<br>o Absenteeism<br>o Turnover<br>o Safety<br>o Flexibility<br>o *Individual attributes*<br>o Mental health (anxiety, low self-esteem, worry, tension)<br>o Psychosomatic illness<br>o Heart disease<br>o Longevity<br>o Education and training<br>o Flexibility | |

| | | |
|---|---|---|
| | o Resilience<br>o *Social structure:*<br>o Occupation structure<br>o Community solidarity<br>o Power structure<br>o Social stratification<br>o Family relationships<br>o Flexibility<br>o Resilience<br>o Robustness<br>o *Social problems:*<br>o Conflict<br>o Non-compliance<br>o Unemployment<br>o Impaired inter-personal relationships<br>o Family violence<br>o Unemployment | |
| Pollnac and Poggie (1988) | • *Job satisfaction*<br>• Individual longevity<br>• Mental health<br>• Family violence<br>• Worker productivity | |
| Smith et al. (2003) | *Mental health*<br>• Anxiety<br>• Stress<br>• Mastery<br>• self-esteem<br>• industry changes<br>• depression<br>• employment<br>• spirituality | |

### A.4.2.3 Engagement and Dependence

Community engagement and/or dependence on a particular resource were often described for the purpose of identifying communities that could potentially be impacted by a particular change in management regulations. Descriptions of engagement and/or dependence used one or more indicators that served as proxies. Table A.4-2 provides a summary of the literature review conducted on studies assessing resource (fishing and forestry) engagement and/or dependence. The analyses reviewed usually used at least one, and usually more than one, of the following indicators as proxies for dependence[5]:

- Employment in fishing as a percentage of total employment in the area under analysis
- Income from fishing as a percentage of total income in the area under analysis
- Number of fishing vessels in the area under analysis
- Number of fishing permits in the area under analysis
- Number of processors/buyers in the area under analysis
- Fish landings to the area under analysis

While other indicators, not listed here, were sometimes used to describe dependence (see Hall-Arber et al., 2001), those listed above were the indicators used most often.

Typically, one of two approaches, or a variation thereof, was used for describing a community's dependence on a resource (see Table A.4-2 for more detail on individual studies and Table A.4-3 for a summary of various methodological approaches).

[5] Often, the term "engagement" was not used.

- Communities are ranked based on indicators represented by values for each indicator category for each community. Communities with indicators represented by high values are characterized as "more dependent" on the resource than communities with indicators representing lower values.
- Communities are ranked from highest to lowest by indicators represented by values for each indicator category for each community. Communities with indicators represented by values above chosen thresholds are labeled "dependent".

While the first method allows for relative dependency comparisons between communities, the second method characterizes all communities above a certain threshold as equivalent.

**Table A.4-12. Determining dependence**

| Author(s) | Primary variables considered | Thresholds |
|---|---|---|
| Dyer and Griffith (1996) | • Repair/supply facilities<br>• Fish dealers/processors<br>• Religious art/architecture dedicated to fishing<br>• Secular art/architecture dedicated to fishing<br>• Number of Multispecies Groundfish (MGF) permits<br>• Number of MGF vessels | No specific thresholds. Consideration of the suggested variables can give an indication with regard to the relative degree of dependence.<br><br>Factors were scored in two ways: nominally (as either present or absent) and ordinally (ranked from 5-highest to 1-lowest). Higher scores indicate greater dependence. Scores for each factor are added together to rank the relative dependence of ports. |
| Jacob et al. (2002) | • Fishing employment (directly and indirectly derived from the fishing sector with the use of regional economic multipliers) as a percentage of total employment | Dependence was defined as at least 15% of total employment (chosen based on ERS calculations – see below) |
| Hall-Arber et al. (2001) | • Employment in fishing as a percentage of the labor force in all occupations<br>• Employment in fishing as a percentage of employment in related occupations within the Bureau of Labor Statistics category of fisheries/forestry/farming<br>• Summary measure of a series of dependency ratios that explore the number of fishermen per hundred to various alternative occupational roles that fishermen could enter with their particular skill profiles | No specific thresholds. Consideration of the suggested variables can give an indication with regard to the relative degree of dependence. |
| European Commission (2000) | • Share of fisheries activity in value added<br>• Share of fisheries employment as a percentage of total regional employment<br>• Share of catch as a proportion of total catch | No specific thresholds. Consideration of the suggested variables can give an indication with regard to the relative degree of dependence. |
| USDA Economic Research Service | • Average annual labor over two years as a percentage of total labor<br>• Proprietors' earnings over two years as a percentage of total earnings | Farming – 15%[6] or more of average annual labor and proprietor's earnings derived from farming during 1998-2000 OR 15% or more of employed residents worked in farm occupations in 2000[7].<br>Mining – 15% or more of average annual labor and proprietors' |

[6] In general, the ERS used one standard deviation from the mean labor and proprietor income for each economic type to help determine the cutoff. The cutoff was then rounded to the nearest 5% (ERS, 2005).

[7] Farming was based on two thresholds. The farming occupation option was adopted to allow counties into the farming-dependent group that had highly farming-oriented economies but did not meet the earnings threshold, most often due to negative farm earnings estimates for some or all of the analyzed years.

| | | |
|---|---|---|
| | | earnings derived from mining during 1998-2000<br>Manufacturing – 25% or more of average annual labor and proprietors' earnings derived from manufacturing during 1998-2000<br>Federal/state government – 15% or more of average annual labor and proprietors' earnings derived from Federal and State government during 1998-2000<br>Services – 45% or more of average annual labor and proprietors' earnings derived from services during 1998-2000 |
| Forest Service (1987) as referenced by Donoghue and Haynes (2002) | • A community's employment in the forest products industry as a percentage of total employment | Dependence was defined as at least 10% of total employment |
| Kenneth and Beale (2002) | A weighted average of :<br>• Wage and salary employment in entertainment and recreation, accommodations, eating and drinking places, and real estate as a percentage of all employment reported in the Census Bureau's County Business Patterns for 1999<br>• Percentage of total personal income reported for the same categories by the Bureau of Economic Analysis<br>• Percentage of housing units intended for seasonal or occasional use reported in the 2000 Census<br>• Per capita receipts from motels and hotels as reported in the 1997 Census of Business. | This study analyzes community dependence on recreational industries.<br><br>The industry categories were chosen after reviewing data for a sample of counties of well-known, undisputed high recreational dependence.<br><br>The variables were converted into z-scores and combined into a weighted index to reflect recreational activity (0.3 employment + 0.3 income + 0.4 seasonal homes). Counties with index scores of 0.67 or higher were regarded as potential recreation counties. Other counties were also considered if they had a score greater than the mean of the index and one of the following conditions was met: 1) the county had at least $400 per capita of hotel-motel receipts or 2) at least 25% of the housing in the county was seasonal. In this way, counties with a high volume of recreational activity but large urban centers that dilute their scores can be included. |
| Norman et al. (forthcoming) | • Value of fish landed in the community<br>• Metric tons of fish landed in the community<br>• Permit holders residing in the community<br>• Vessel owners residing in the community<br>• Number of vessels delivering fish to the community | All variables were outputs generated by a Data Envelopment Analysis (DEA) Model, where inputs were community populations. The model thereby compared all communities to one another in terms of fishing outputs per capita, and generated a list of communities in rank order by level of dependence on fishing. Communities were analyzed as dependent upon fishing in general, or engaged in a specific fishery, relative to one another and then rank ordered according to the relative importance of their dependence or engagement score. No specific threshold was identified. However, once assembled in a rank ordering, communities which scored at least |

| | | |
|---|---|---|
| | | one standard deviation above the mean on either the dependence or engagement scale were selected for detailed profiling. |
| Sepez et al. (2005) | • Metric tons of fish landed in the community<br>• Number of processors in the community<br>• Number of vessels delivering fish to that community<br>• Number of vessels homeported in the community<br>• Number of vessel owners residing in the community<br>• Number of crew licenses in the community<br>• Ratio of state-issued fishing permits to population<br>• Ratio of state-issued setnet fishing permits to population<br>• Ratio of federally issued vessel permits to population<br>• Aggregate of all indicators described above per capita | If any one of these indicators for a particular Alaskan community exceeded the threshold of 0.15, which in most cases was determined as a ratio to community population, it was determined to be significantly linked to fishing and selected for profiling. |
| Langdon-Pollack (2004) | • Population<br>• Poverty<br>• Unemployment<br>• Per capita income<br>• Year that houses were built<br>• Percent of vacant houses<br>• Number of industries outside fishing<br>• Number of berths<br>• Percent that a harbor is filled with commercial and/or rec vessels<br>• Landings data and number of suppliers<br>• Processors<br>• Community fishing organizations<br>• Community fishing events | The author suggests the use of these indicators in a dependency index. However, after collecting this data for the Pacific coast region, it was determined that creating a dependency index was impractical given the available information. |
| Daniels (2004) | • The amount of forest land per county as a percentage of total county land | The ranked list of counties and their values were divided into three equal parts. The top third was labeled with a “high” dependence, the second third with a “medium” dependence and the lowest third was labeled with “low” forest dependence. |

**Table A.4-13. Methodologies used in past research to identify dependence**

| Method | Sources that use this method | Threshold identified? How? | Primary variables | Notes |
|---|---|---|---|---|
| **Dependence threshold using indicators as proxies for dependence** | Forest Service (1987), USDA ERS, Jacob et al. (2002) | The threshold was identified by estimating one standard deviation from the mean for each variable to help determine the cutoff. The cutoff was then rounded to the nearest 5%. | • Industry employment as a percentage of total area employment (using multipliers or input-output model)<br>• Industry earnings as a percentage of total area earnings | |
| **Dependence threshold using an index as a proxy for dependence** | Kenneth and Beale (2002) | The variables were converted into z-scores and combined into a weighted index to reflect recreational activity (0.3 employment + 0.3 income + 0.4 seasonal homes). Counties with index scores of 0.67 or higher were regarded as potential recreation counties. Other counties were also considered if they had a score greater than the mean of the index and one of the following conditions was met: 1) the county had at least $400 per capita of hotel-motel receipts or 2) at least 25% of the housing in the county was seasonal. In this way, counties with a high volume of recreational activity but large urban centers that dilute their scores can be included. | • Wage and salary employment in entertainment and recreation, accommodations, eating and drinking places, and real estate as a percentage of all employment<br>• Percentage of total personal income<br>• Percentage of housing units intended for seasonal or occasional use reported<br>• Per capita receipts from motels and hotels | Used to determine recreational dependence |
| **Relative dependence of communities using indicators as proxies for dependence** | Daniels (2004), Hall-Arber et al. (2001), European Commission (2000) | No threshold identified. Consideration of the suggested variables can give an indication with regard to the relative degree of dependence. | • Employment in fishing as a percentage of the labor force in all occupations<br>• Employment in fishing as a percentage of employment in related occupations within the Bureau of Labor Statistics category of fisheries/forestry/farming<br>• Summary measure of a series of dependency ratios that explore the number of fishermen per hundred to various alternative occupational roles that fishermen could enter with their particular skill profiles<br>• Share of fisheries activity in value added<br>• Share of catch as a proportion of total catch<br>• The amount of forest land per county as a percentage of total county land | Daniels (2004) used this method to help identify “areas of concern”. The ranked list of counties and their values were divided into three equal parts. The top third was labeled with a “high” dependence, the second third with a “medium” dependence and the lowest third was labeled with “low” forest dependence. |
| **Relative dependence of communities using as index as a proxy for dependence** | Dyer and Griffith (1996) | No threshold identified. Consideration of the suggested variables can give an indication with regard to the relative degree of dependence. | • Infrastructure - Repair/supply facilities, fish dealers/processors<br>• Art/architecture dedicated to fishing<br>• Number of permits<br>• Number of vessels | |
| **Relative dependence on** | Norman, et al. (forthcoming) | Communities were analyzed as dependent upon fishing in general, or engaged in a specific fishery, | • Value of fish landed in the community | Engagement analysis focused on the value of fish landed, permit |

| | | | | |
|---|---|---|---|---|
| **fishing and engagement in specific fisheries using indicators as proxies for dependence and engagement** | | relative to one another and then rank ordered according to the relative importance of their dependence or engagement score. No specific threshold was identified. However, once assembled in a rank ordering, communities which scored at least one standard deviation above the mean on either the dependence or engagement scale were selected for detailed profiling. | • Metric tons of fish landed in the community<br>• Permit holders residing in the community<br>• Vessel owners residing in the community<br>• Number of vessels delivering fish to the community | holders, and fishery-specific vessels owned by community members. Each of these categories was broken down by each North Pacific and Pacific fishery management group. |

### A.4.2.4 Resilience

Often, once community dependence is described in the reviewed literature, an assessment of community resilience is often made. Resilience is typically defined as the ability for a community to adapt to change. An assessment of resilience is made in order to assess the potential impact the change in management regulations will have on the areas under analysis. It is typically assumed that the greater socio-economic and cultural diversity and infrastructure an area has, the more resilient an area will be if a management regulation negatively affects the area. Indices, or aggregations of indicators represented by values are often used as a proxy for resilience. These indices include a greater variety of indicators than the list of indicators used as proxies for dependence (see Table A.4-4). Resiliency indices in the studies reviewed sometimes included some of the following indicators:

- Employment in various industries
- Unemployment
- Income
- Resident mobility
- Resident education, skills and training
- Population density (as a proxy for community infrastructure)
- Community isolation
- Fisheries specific infrastructure

Several of the studies reviewed use indices of community well-being as a guide in developing resiliency indicators.

**Table A.4-14. Determining resilience**

| Author(s) | Variables incorporated into resilience indicator | Comments |
|---|---|---|
| Hall-Arber et al. (2001) | • Infrastructure<br>o Icehouse<br>o NMFS extension office<br>o Dockside diesel fuel<br>o International fish brokers<br>o Boat insurance<br>o Local trucking<br>o Fish processor<br>o Fishing monument<br>o Boat welders<br>o Fishermen supply house<br>o Vessel haul out facility<br>o Bait house<br>o 3+ fishing associations<br>o Marine supply house<br>o Local net maker<br>o Fish retail store<br>o 2 or fewer association | Surveys of 25 local communities and principal components analysis was used to rank the infrastructure factors and aggregate these into a score for each community to show relative resilience. |
| Charles et al. (2001) | • Debt levels among fishermen<br>• Reported bankruptcies<br>• Bankruptcy liabilities<br>• Distribution of landed value across species<br>• Proportion of fishers with multiple licenses<br>• Age distribution of fishers<br>• Diversification of employment sources | The authors suggest use of these indicators to proxy resilience. |
| Pollard (2004) | • Isolation<br>• Deprivation index<br>o Income<br>o Employment<br>o Health deprivation and disability<br>o Education skills and training,<br>o Housing | This report identifies “vulnerable” areas based on their location (as categorized by Travel to Work Areas – an indication of their rural status and remoteness), deprivation, and regional policy. |

| | | |
|---|---|---|
| | o Geographical access to services | |
| Daniels, JW (2004); Horne and Haynes (1999) | • *Lifestyle diversity*<br>Mobility<br>Ethnicity<br>Degree of urbanness<br>Race<br>Income<br>Education<br>• *Economic diversity*<br>employment in county *i* in industry *j*,<br>*Ei* = total employment in county *i*,<br>*Ej* = total employment in industry *j* in all counties, and<br>*E* = total employment in all industries across all counties.<br>• *Population density*<br>(proxy for civic infrastructure) Greater population density is assumed to lead to a more developed county infrastructure and so increases socioeconomic resiliency. | Each county received an overall socioeconomic resiliency rating corresponding to an unweighted average of its ranks for lifestyle diversity, economic resiliency, and population density. These values were then sorted from highest to lowest value and divided into thirds. Counties in the top third had the highest socioeconomic resilience and so were given a rating of "high." Counties in the middle third were given a "medium," and counties in the last third were given a "low" socioeconomic resiliency rating. |
| Sommers (2001) | • Demographics<br>• Employment<br>• Government revenues<br>• Facilities and infrastructure<br>• Social services burden<br>• Federal assistance<br>• Business trends<br>• Taxes | |
| Wilson and McCay (1998) | • Existence of alternative activities, both fishing and non-fishing (the more alternatives available to someone who must change their behavior because of a regulation, the better that person is able to deal with the change)<br>• Economic vulnerability (amount and sources of pressure and competition faced in running fishing operators and selling their products. The more vulnerable the fish-related operation is, the greater the impact's regulation.<br>• Community support (communities differ in the degree to which social capital is available to people and fishing operations affected by regulation. The more community support, the better the communities can absorb the regulation's impact. | While this study does not call itself a resiliency report, it offers "3 characteristics of communities influencing the magnitude and importance of the impact" which is a measure of resiliency |

### A.4.2.5 "Communities of concern" or "areas of vulnerability"

In the reviewed literature, the purpose of identifying "communities of concern" or "areas of vulnerability" is to alert decision-makers to areas that may require particular focus and/or mitigation efforts. Most of the reviewed studies that attempted to measure dependence *and* resilience used these two measurements to identify the areas that had both relatively high dependence and relatively low resilience levels. These areas are then labeled as "communities of concern" or "areas of vulnerability" (see Table A.4-5). The states of Washington, Oregon and California have their own definitions of "distressed", "disadvantaged" or "high unemployment" areas (see Table A.4-6). Washington and California rely upon unemployment rates while Oregon uses indices averaging employment change, average wage change, annual employment rate relative to the state level, and per capita personal income relative to state[8].

[8] To determine whether an incorporated city or sub-city area in a non-distressed county is distressed, four factors were used including: poverty rate, per capita personal income, percent of population aged 25+ with college education, and unemployment rate.

**Table A.4-15. Linking dependence and resilience to identify vulnerable areas**

| Author (s) | Definition of "communities of concern" or "vulnerable areas" | Comments |
|---|---|---|
| Crone and Haynes (2001) | Wood products counties of concern – a minimum 10% employment in SIC category 24 and contained two or more communities with medium to very high wood products specialization rating<br>Range counties of concern – 12% or more of agricultural sales derived from sheep or cattle produced from federal forage, harvest levels, animal unit months | Community ranking - Communities were ranked that contained two or more isolated communities that had a medium to very high wood products or agricultural specialization and for which at least 33% of the land in a 20 mile radius circle is FSBLM land (wrt wood products). The counties were ranked from 1 to 3 based on how high a concern the area was.<br><br>Finding the preferred alternative - Rankings were aggregated and the lowest aggregate level indicated the preferred alternative. |
| Daniels (2004) | Areas with "low" socioeconomic resilience and "high" forest dependence (see Tables 2 and 3 for definitions) | |
| Pollard (2004) | Areas with overlap of high dependence, remoteness, and a high deprivation index score | See Table 3 for more details on indicators used. |

**Table A.4-16. Distressed counties**

| State | Definition of "distressed" | Communities |
|---|---|---|
| **Washington** | Counties having three year average unemployment rate greater than or equal to 120% of the state average (Jan 2002-Dec 2004) | Adams, Clark, Columbia, Cowlitz, Ferry, Grant, Grays Harbor, Klickitat, Lewis, Okanogan, Pacific, Pend Oreille, Skamania, Stevens, Wahkiakum, Yakima[9] |
| **Oregon** | To determine whether a county is distressed or not, four factors were used to create an index for the county. These factors are:<br>• Employment change (ever the most recent period for which data is available);<br>• Average wage change (over the most recent period for which data is available);<br>• Annual employment rate relative to state (latest year for which data is available); and<br>• Per capita personal income relative to state (latest year for which data is available.[10]<br>To determine whether an incorporated city or sub-city area in a non-distressed county is distressed, four factors were used:<br>• Poverty rate (i.e. percent of the population in poverty)<br>• Per capita personal income<br>• Percent of population aged 25+ with college education<br>• Unemployment rate[11] | Severely distressed counties – Baker, Columbia, Coos, Crook, Douglas, Grant, Harney, Klamath, Lake, Linn, Malheur, Sherman, Umatilla, Wallowa, Wasco, Wheeler<br>Distressed counties – Curry, Gilliam, Hood River, Jefferson, Josephine, Lincoln, Marion, Morrow, Union<br><br>Severely distressed city/area – Monroe, Butte Falls, Eagle Point, Talent, Phoenix, Gold Hill, Oakridge, Creswell, Lowell, Cottage Grove, Springfield, Florence, Lents area of Portland, North/NE Portland, Rockwood area of Portland, Falls City, Independence, Garibaldi, Gaston, Dayton, Sheridan, Lafayette, McMinnville<br>Distressed city/area – Johnson City, Estacada, Warrenton, Seaside, Astoria, Rogue River, Veneta, Westfir, Fairview, Wood Village, Dallas, Monmouth, Tillamook, Bay City, Cornelius, Forest Grove, Amity, Newberg, Willamina[12] |

[9] Assessed by the Washington State Employment Security Department. Distressed Areas List for 2005. www.workforceexplorer.com/article.asp?ARTICLEID=5010

[10] The index is a composite of these four factors. A county is distressed if its index is less than 1.0 and non-distressed otherwise. If a county is distressed, all of its parts are considered to be distressed. An index less than one shows that, on average, economic conditions worsened for a county relative to the state over the period under consideration.

[11] If three or more of these factors were worse than a threshold value, then that place was identified as distressed. The threshold value is a representative value for each of the four factors in distressed counties.

| | | |
|---|---|---|
| **California** | There are several measures used to qualify communities for specific programs in California. Some examples are:<br>1) A county is labeled "distressed" if it has an unemployment rate exceeding 125% of the statewide average.<br>2) The Employment Training Administration of the Federal Department of Labor designates Labor Surplus Areas for Workforce Development and defines them as areas that have had unemployment rates of 120% of the national average for two fiscal years.<br>3) To qualify for the Federal Foreign Investor Visa Program, a county must be a high unemployment area with an unemployment rate of 150% above the national average). | 1) Del Norte, Alpine, Monterey, San Joaquin, Modoc, Lake, Madera, Stanislaus, Glenn, Siskiyou, Plumas, San Benito, Yuba, Kern, Sierra, Fresno, Sutter, Trinity, Merced, Kings, Tulare, Colusa, Imperial[13]<br><br>2) Alpine, Colusa, Del Norte, Glenn, Imperial, Kern, Kings, Lasses, Madera, Merced, Modoc, Monterey, Plumas, San Benito, San Joaquin, Santa Clara, Shasta, Sierra, Siskiyou, Stanislaus, Sutter, Tehama, Trinity, Tulare, Yuba<br><br>3) Kern, Imperial, Fresno, Kings, Madera, Merced, Stanislaus, San Benito, San Joaquin, Tulare, Sutter, Yuba |

#### A.4.2.5 Scale

Almost all of the literature reviewed cautioned against the use of the dependence and resiliency indicators and indices as the primary guidance for making fishery management decisions due to the scale of analysis. Most of the studies used data on the county level which was admittedly too large a scale to accurately measure community dependence and resilience. However, in almost all cases, data on a smaller scale was not available.

### *A.4.3 Analysis for assessing engagement, dependence, resilience and vulnerable areas*

#### A.4.3.1 Methodology for determining engagement and dependence in the commercial and recreational fisheries

Characterization of community engagement in fishing requires consideration of geographic use on the Pacific fish resource in general while a description of community dependence requires consideration of geographic use of the Pacific groundfish resource specifically. The following indicators are used as proxies for overall community engagement in the Pacific coast commercial fishery:

- Number of federal and state fishing permits as a percentage of each state's total number of permits (based on owner mailing address)
- Number of commercial fishing vessels (based on owner mailing address)
- Revenue from fish landings as a share of coastwide revenue from fishing landings
- Number of processors/buyers

Port/city and county level data was available for each of the above indicators. Data for 2005 is used because it is the most recent year data is available for and because a using a single year is the most simplified way to conduct the analysis (which was a deemed necessary due to time constraints).

The following indicators are used as proxies for overall community engagement and dependence in the Pacific coast recreational fishery:

---

[12] Assessed by the Oregon Economic and Community Development Department for 2005. www.econ.state.or.us/distMethods.htm

[13] "Economically distressed counties" are defined in a 1999 state statute and the counties qualifying are based on 2004 data. Information in the above table came from the California Economic Development Department (http://www.edd.ca.gov/).

- Number of charter vessels as a percentage of each states total number of charter vessels
- Number of private/rental angler trips as a percentage of each state's total number of private/rental angler trips
- Number of private/rental groundfish angler trips as a percentage of each state's total number of private/rental groundfish angler trips
- Number of party/charter trips as a percentage of each state's total number of party/charter trips
- Number of party/charter groundfish trips as a percentage of each state's total number of party/charter groundfish trips

Port/city level data was available for Oregon and Washington. Region level data was available for California. Data for 2005 is used for the reasons given above.

The following indicators are used as proxies for community dependence on the Pacific coast groundfish fishery specifically:

- Number of federal and state groundfish permits as a percentage of each state's total number of groundfish permits (based on owner mailing address)[14]
- Groundfish revenue as a percentage of total community fisheries revenue
- Groundfish revenue as a percentage of total groundfish revenue coastwide

Port/city and county level data was available for each of the above indicators. Region level data was available for California. Data for 2005 is used for the reasons given above.

These sets of indicators were chosen based largely on: 1) the kind indicators seen in the literature and 2) data availability. Most of the data was obtained from PacFIN and state fishery management agencies. Other data, not included in this analysis, was available on a port group level (income from commercial and recreational groundfish fishing as a share of total personal income, number of persons employed by entities involved in commercial and recreational groundfish and other fishing or groundfish and other processing operations as a percentage of the total number of employed persons). This data has been included and discussed in other parts of the EIS.

To describe the relative community engagement in and dependence on the Pacific fishery resource, first, indicators represented by values were assigned to each community (port/city/county/region) within each category (Overall Community Engagement in the Pacific Coast Commercial Fishery, Overall Community Engagement and Dependence in the Pacific Coast Recreational Fishery, Community Dependence on the Pacific Coast Groundfish Fishery). Second, the communities were ranked from highest indicator value to lowest indicator value for each indicator. Third, the top one-third of communities was identified for each indicator. Fourth, the number of times a community was listed in the top one-third for each indicator was tallied. The communities that were tallied one or more times in the category of overall community engagement and/or dependence in the Pacific coast commercial fishery and/or overall community

[14] Permits were characterized as "groundfish" permits if they were one of the following types: federal LE groundfish permit with a trawl or fixed gear endorsement, CA deeper nearshore species fishery permit, CA nearshore fishery bycatch permit, CA nearshore north central trap endorsement permit, CA nearshore north central fishery permit, CA nearshore north fishery permit, CA nearshore south central fishery permit, CA nearshore south central trap endorsement permit, CA nearshore south fishery permit, CA nearshore south trap endorsement permit, ORrockfish nearshore endorsement permit, OR rockfish permit, WA coastal hagfish permit, WA Puget Sound whiting trawl permit.

engagement and dependence in the Pacific coast recreational fishery were labeled as relatively "highly engaged" or "highly dependent" for each category.

#### A.4.3.2 Methodology for determining resilience

The purpose of gauging resiliency by community is to determine which communities are least able to adapt to a decrease in harvest as a result of a change in regulations. In some of the papers reviewed, the authors assume that the relationship between diversity and resiliency in social and economic systems is similar to that in the ecological literature. That is, a system with higher diversity is less affected by change than a system with lower diversity and the more diverse system therefore has higher resiliency. Socioeconomic systems (communities in this case) with higher resiliency are defined here as those that adapt quickly as indicated by rebounding measures of socioeconomic well-being. We assume that communities with high resiliency have access to diverse employment opportunities, higher employment rates, lower numbers of people living below the poverty line, are not located in isolated cities, and have the necessary municipal/county infrastructure to enable a rebound from a decrease in catch limits. That is, it is assumed that if the local fishing sector within a community with high resiliency experiences a major downturn, unemployment rates will rise only briefly until displaced people find other employment. It is assumed that communities with low resiliency have more lingering negative impacts, such as unemployment or out-migration rates that remain high for many years.

The theoretical basis for gauging resiliency rests on the concept of social well-being, which is sometimes defined as a composite of four factors: economic resiliency, social and cultural diversity (population size, mix of skills), civic infrastructure (leadership, preparedness for change), and amenity infrastructure (attractiveness of the area) (McCool and others 1997). For this analysis, indicators were chosen with these factors in mind. The following indicators were used as proxies for describing resiliency:

- Industry diversity index[15]
- Unemployment rate
- Percentage of the population living below the poverty line
- Isolated cities[16]
- Population density[17]

City and county level data was available for each of the above indicators except isolated city which was only analyzed on the city level. The most recent data available was used (2002 and 2003).

---

[15] The industry diversity index was used to attempt to characterize the diversity of employment in the community. It was assumed that a community with more types of industries, the more resilient the community may be to negative impacts to the fishing industry. The index was used to identify communities with very little employment in industries other than fishing. The index was calculated using all nineteen major industry categories used in the Census. Numbers of persons employed in each industry category was gathered for each port and for each coastal county. The Shannon-Weiner index was used to measure industry diversification. This index was originally used to measure species diversity in an ecosystem. However, it has also been used in socioeconomic analyses to measure industry diversification. The greater number of employees and the more even the distribution of employees across industries both increase the index (see Tables A.4-18 and A.4-19 for diversity index results).

[16] Identification of isolated cities was made by Langdon-Pollack (2004). The analysis defined geographically isolated cities as those cities located in coastal counties with a population of 1,900 or less, were not located on a major highway and fell outside of the 35-mile buffer of cities over 20,000. The isolated cities in Washington include: Neah Bay, La Push, Tahola, Moclips, Copalis Beach, Ocean City, Markham, Junction City, Cohassett Beach, Grayland, Tokeland, Ocean Park, and Naselle. The isolated cities in Oregon include: Oceanside, Cape Mears, Netarts, and Powers. California did not have any geographically isolated cities.

[17] A proxy for municipal infrastructure.

The above indicators were chosen based on: 1) similar indicators used in the literature and 2) data availability. Almost all of the indicator data was gathered from U.S. Census data. While several other indicators, such as educational attainment and income, could have been added to the analysis, the indicators used were deemed most relevant. Theoretically, many of the indicators used are likely correlated with educational attainment and income.

To describe relative community resilience, first, indicators represented by values were assigned to each community (port/city/county). Second, the communities were ranked from least resilient to most resilient based on the value for each indicator. Third, the top one-third of communities was listed for each indicator. Fourth, the number of times a community was listed in the top one-third for each indicator was tallied. The communities that were tallied one or more times were labeled as relatively "low resilience" for purposes of this analysis.

#### A.4.3.3 Methodology for identifying "vulnerable areas"

"Vulnerable areas" are defined in this analysis as those communities that are both "highly engaged" or "highly dependent" and have relatively "low resilience". If a community appears in the "highly engaged" or "highly dependent" list and the "low resilience" list, then the community is listed as a "vulnerable area" for the purposes of this analysis. However, it is important to note that various deficiencies in the data make the analysis results somewhat unreliable for the purposes of definitively identifying communities that are most highly engaged, most dependent, and least resilient. For example, the analysis does not incorporate measures of employment and income to supply industries (shipyards, cold storage, processing). Therefore, the results of this analysis must be considered with other information provided in the chapter and appendices.

### *A.4.4 Engagement and Dependency Indicator Results*

#### A.4.4.1 Commercial Fishing – General

Table A.4-7 displays the indicators and their representative values and rank used to rate the relative engagement of communities in commercial fishing. Table A.4-7 also shows the indicators used to rate the relative dependence of communities on the groundfish resource by city. The isolated areas indicators were applied to both engagement and dependency. Table A.4-8 displays these same indicators by value and ranking by county.

Table A.4-9 displays the number of times the cities scored in the top one-third of the commercial fishing engagement indicators. Astoria, Bellingham, Coos Bay, Crescent City, Eureka, Fort Bragg, Ilwaco, Newport, San Francisco, San Pedro, Santa Barbara, and Westport all scored highest with a score of four. That is, they all were ranked in the top one-third of all four indicators used to measure engagement in the Pacific fisheries. Table A.4-10 displays the top scoring counties with regard to the commercial fishing engagement indicators. Coos, Grays Harbor, and Lincoln counties top the list scoring four out of four. Clatsop, Humbolt, Los Angeles, Mendocino, Orange, Pacific, San Diego, San Mateo, and Whatcom counties also score highly.

#### A.4.4.2 Commercial Fishing – Groundfish

Table A.4-11 displays the number of times the cities scored in the top one-third of commercial groundfish dependency indicators. Astoria, Bellingham, Brookings, Coos Bay, Crescent City, Eureka, Fort Bragg, Morro Bay, Newport, Port Orford, and San Francisco are all heavily dependent upon the groundfish resource (scoring three out of three). Astoria, Bellingham, Coos Bay, Crescent City, Eureka, Fort Bragg,

Newport, and San Francisco are all both highly engaged in the Pacific fisheries and highly dependent on the groundfish resource. Table A.4-12 displays the top scoring counties with regard to the commercial groundfish dependency indicators. Los Angeles county scores highest (three out of three). Clatsop, Coos, Curry, Grays Harbor, Lincoln, and Ventura counties also scored highly. Clatsop, Coos, Grays Harbor, Lincoln, and Los Angeles counties are all both heavily engaged in fishing in general and heavily dependent upon the groundfish resource.

The analysis was done in such a way that communities heavily engaged in commercial groundfish fishing specifically and on a large scale were indirectly given greater weight in the analysis. Therefore, communities heavily engaged in commercial fishing in general and groundfish in particular scored higher than communities only heavily engaged in commercial fishing in general. The analysis also used indicators (port groundfish revenue as a percentage of total port revenue, isolated areas) that allowed for small cities focusing on groundfish fishing to be identified as relatively dependent on groundfish. Smaller communities not focusing on groundfish heavily can be ranked as relatively engaged due to inclusion of indicators that account for a large number of small vessels.

#### A.4.4.3 Recreational Fishing

Table A.4-13 shows the relative rankings of the number of charter vessels in California as a percentage of the state total by region while Table A.4-14 shows the relative rankings of the recreational engagement indicators by county group. California data was separated from Oregon and Washington due to the differences in scale between California (comparable on the region and county group level) and Oregon and Washington (comparable on the port level only). Due to the scarcity of recreational data, indicators represented by values for all regions/port groups/ports are included in Tables A.4-13, A.4-14, and A.4-15. Table A.4-15 shows the relative rankings of the recreational engagement indicators by county group (including number of charter vessels as a percentage of the state total). Tables A.4-16 and A.4-17 show the number of times the regions/port groups/cities scored in the top one-third of the recreational engagement indicators for California and Oregon/Washington, respectively. The analysis indicates that San Luis Obispo through Santa Cruz and San Diego through LA are the most heavily engaged regions in fishing in California. In Oregon and Washington, the four most heavily engaged communities are all located in Oregon (Newport, Garibaldi, Brookings, Charleston) with Newport being the most heavily engaged.

The analysis was done in such a way that communities heavily engaged in groundfish recreational fishing specifically (compared to recreational fishing in general), were indirectly given greater weight in the analysis. Therefore, communities heavily engaged in recreational fishing in general and groundfish in particular scored higher than communities only heavily engaged in recreational fishing in general.

**Table A.4-17. Commercial indicators and rankings by city**

| City | Total Number of Vessels Participating in Any Fishery in 2005 by Port | Rank | Dealers | Rank | Permits as a % of state total | Rank | Groundfish permits as a percentage of the state total | Rank | Port fish revenue/ Coastwide fish revenue | Rank | Port groundfish revenue/ Port fish revenue | Rank | Port groundfish revenue/ Coastwide groundfish revenue | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aberdeen | | | | | 5.21% | 10 | 5.19% | 13 | | | | | | |
| Alameda | 4 | | 4 | | 0.29% | | 0.28% | | | | | | | |
| Albion | 11 | | 5 | | 0.48% | | 0.85% | | | | 28.7% | 22 | | |
| Anacortes | 107 | 19 | 19 | 26 | 5.27% | 9 | 0.65% | | 0.9% | | | | | |
| Arroyo Grande | | | | | 0.67% | | 1.28% | 62 | | | | | | |
| Astoria | 269 | 4 | 26 | 19 | 11.57% | 1 | 6.69% | 8 | 13.4% | 2 | 31.9% | 19 | 18.2% | 1 |
| Atascadero | | | | | 0.83% | | 1.84% | 43 | | | | | | |
| Avalon | | | | | 0.41% | | | | | | | | | |
| Avila | 63 | 29 | 16 | 29 | | | | | 0.3% | | 70.2% | 4 | 0.8% | |
| Bandon | 10 | | 3 | | 2.37% | 22 | 2.87% | 22 | | | * | | | |
| Bellingham | 232 | 7 | 34 | 14 | 7.64% | 5 | 2.60% | 29 | 4.5% | 6 | 55.3% | 7 | 10.6% | 3 |
| Berkeley | 27 | | 21 | 24 | 0.20% | | 0.14% | | | | 17.9% | | | |
| Blaine | 101 | 22 | 11 | | 2.43% | 20 | 2.60% | 30 | 1.0% | | 37.0% | 16 | 1.6% | |
| Bodega Bay | 234 | 6 | 53 | 3 | 2.34% | 23 | 1.42% | 51 | 1.0% | | 2.8% | | 0.1% | |
| Brookings | 102 | 21 | 20 | 25 | 7.82% | 4 | 7.32% | 6 | 1.5% | | 27.8% | 23 | 1.8% | 13 |
| Cambria | | | | | 0.24% | | 1.28% | 63 | | | | | | |
| Cannon Beach | 4 | | 3 | | 0.13% | | | | | | | | | |
| Cathlamet | | | | | 2.07% | 29 | | | | | | | | |
| Charleston | | | | | 4.40% | 15 | 1.91% | 41 | | | | | | |
| Chinook | | | | | 2.25% | 26 | 3.90% | 18 | | | | | | |
| Clackamas | | | | | 0.86% | | 4.78% | 14 | | | | | | |
| Clatskanie | | | | | 1.47% | | | | | | | | | |
| Coos Bay | 392 | 2 | 40 | 10 | 4.97% | 13 | 3.82% | 19 | 7.8% | 4 | 24.6% | 24 | 8.1% | 5 |
| Costa Mesa | | | | | 0.35% | | 1.42% | 49 | | | | | | |
| Crescent City | 134 | 14 | 20 | 25 | 4.59% | 14 | 9.22% | 4 | 2.8% | 7 | 19.0% | 28 | 2.2% | 10 |
| Dana Point | 52 | | 25 | 20 | 0.65% | | 0.57% | | 0.4% | | 7.3% | | 0.1% | |
| Depoe Bay | 18 | | 15 | | 0.99% | | | | | | 3.8% | | | |
| Edmonds | | | | | 1.01% | | 1.30% | 60 | | | | | | |
| El Granada | | | | | 1.12% | | 1.56% | 46 | | | | | | |
| Eureka | 101 | 22 | 21 | 24 | 2.21% | 27 | 2.13% | 35 | 2.2% | 11 | 52.8% | 10 | 5.0% | 6 |
| Everett | 47 | | 8 | | 0.83% | | | | 0.3% | | 74.7% | 2 | 1.1% | |
| Ferndale | | | | | 2.01% | 32 | 0.28% | | | | | | | |
| Fields Landing | 9 | | 1 | | | | | | | | | | | |
| Florence | 18 | | 14 | | 1.90% | 37 | 0.96% | 75 | | | | | | |
| Fort Bragg | 257 | 5 | 42 | 9 | 5.17% | 11 | 7.66% | 5 | 2.3% | 10 | 40.6% | 15 | 3.9% | 7 |
| Friday Harbor | 14 | | 6 | | 1.18% | | | | | | | | | |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Garibaldi | | | | | 2.12% | 28 | 2.55% | 33 | | | | | | |
| Gearhart/Seaside | 5 | | 4 | | | | | | | | | | | |
| Gig Harbor | | | | | 1.78% | | 2.60% | 28 | | | | | | |
| Gold Beach | 40 | | 4 | | 2.07% | 30 | 5.73% | 11 | * | | * | 3 | * | |
| Goleta | | | | | 0.81% | | 0.99% | 72 | | | | | | |
| Grayland | | | | | 1.78% | | | | | | | | | |
| Grays Harbor | 27 | | 2 | | | | | | * | | | | | |
| Half Moon Bay | | | | | 1.08% | | 1.42% | 50 | | | | | | |
| Hammond | | | | | 1.17% | | 1.91% | 40 | | | | | | |
| Harbor | | | | | 2.29% | 24 | 4.14% | 16 | | | | | | |
| Hoquim | | | | | | | | | | | | | | |
| Huntington Beach | | | | | 0.43% | | 0.99% | 70 | | | | | | |
| Ilwaco | 169 | 11 | 16 | 29 | 2.43% | 19 | 0.65% | | 4.9% | 5 | 14.7% | | 3.1% | 8 |
| La Conner | 76 | 27 | 6 | | | | | | 0.1% | | | | | |
| La Push | 35 | | 2 | | 0.24% | | 0.65% | | * | | * | 20 | * | |
| Lake Forest | | | | | 0.19% | | 1.56% | 45 | | | | | | |
| Lake Forest Park | | | | | 0.65% | | 7.14% | 7 | | | | | | |
| Long Beach | 12 | | 9 | | 1.60% | | 0.43% | | 0.2% | | 1.8% | | | |
| Long View | | | | | | | | | | | | | | |
| Los Osos | | | | | 0.98% | | 2.70% | 24 | | | | | | |
| Mckinleyville | | | | | 0.91% | | 1.13% | 68 | | | | | | |
| Monterey | 78 | 26 | 18 | 27 | 2.00% | 33 | 1.56% | 44 | 0.5% | | 16.9% | | 0.3% | |
| Morro Bay | 111 | 18 | 44 | 8 | 2.75% | 17 | 5.82% | 10 | 0.8% | | 48.3% | 11 | 1.7% | 14 |
| Moss Landing | 220 | 8 | 37 | 12 | 0.74% | | 0.85% | | 1.8% | 16 | 23.0% | 26 | 1.8% | 12 |
| Neah Bay | 60 | | 6 | | 0.53% | | 4.55% | 15 | 0.4% | | 64.1% | 5 | 1.2% | |
| Nehalem Bay | 2 | | 1 | | | | | | | | | | | |
| Newport | 451 | 1 | 69 | 2 | 8.20% | 3 | 10.19% | 3 | 11.1% | 3 | 35.9% | 17 | 16.9% | 2 |
| Newport Beach | 19 | | 16 | 29 | 0.33% | | 0.28% | | 0.1% | | 41.6% | 13 | 0.2% | |
| North Bend | | | | | 1.99% | 34 | 0.96% | 73 | | | | | | |
| Oakland | 1 | | 1 | | 0.46% | | 1.99% | 36 | | | | | | |
| Ocean Park | | | | | 1.24% | | | | | | | | | |
| Oceanside | 35 | | 14 | | 0.43% | | | | 0.4% | | 28.9% | 21 | 0.5% | |
| Olympia | | | 2 | | 1.18% | | 0.65% | | | | | | | |
| Oth Humboldt cnty ports | 20 | | 16 | 29 | | | | | | | 13.4% | | | |
| Oth Marin/Sonoma outer coast ports | 30 | | 16 | 29 | | | | | 0.1% | | 7.2% | | | |
| Oth Mendocino cnty ports | 9 | | 6 | | | | | | | | 12.1% | | 0.1% | |
| Oth Monterey/Sta Cruz cnty ports | 9 | | 6 | | | | | | | | 100.0% | 1 | | |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oth No Puget Snd ports | 16 | | 9 | | | | | | | | | | | |
| Oth Orange/LA cnty ports | 78 | 26 | 34 | 14 | | | | | 0.4% | | 52.8% | 9 | 0.9% | |
| Oth San Diego cnty ports | 60 | | 32 | 15 | | | | | 0.6% | | 21.8% | 27 | 0.5% | |
| Oth San Luis Obispo cnty ports | 2 | | 2 | | | | | | | | * | | | |
| Oth SFBay/San Mateo cnty ports | 24 | | 17 | 28 | | | | | 0.1% | | 1.6% | | | |
| Oth So Puget Snd ports | 5 | | 2 | | | | | | | | | | | |
| Oth Ventura/Sta Barbara cnty ports | 1 | | 1 | | | | | | | | | | | |
| Other Col R ports | 75 | 28 | 16 | 29 | | | | | 0.2% | | 5.8% | | | |
| Other Washington Coastl Ports | 10 | | 3 | | | | | | | | | | | |
| Other/unknown CA ports | 8 | | 6 | | | | | | | | 1.5% | | | |
| Other/unknown WA | 17 | | 3 | | | | | | | | | | | |
| Oxnard | 89 | 23 | 47 | 6 | 2.52% | 18 | 2.70% | 25 | 1.0% | | 12.7% | | 0.5% | |
| Pacific City | 31 | | 11 | | 1.73% | | 3.18% | 21 | | | 53.1% | 8 | 0.1% | |
| Point Arena | 20 | | 16 | 29 | 0.41% | | 0.57% | | 0.1% | | 18.3% | 29 | 0.1% | |
| Point Reyes | 20 | | 3 | | | | | | | | | | | |
| Port Angeles | 82 | 24 | 5 | | 1.30% | | 3.90% | 17 | 0.4% | | 46.7% | 12 | 0.7% | |
| Port Hueneme | 41 | | 14 | | 0.45% | | 0.43% | | 2.6% | 8 | | | | |
| Port Orford | 80 | 25 | 12 | | 5.61% | 7 | 16.56% | 2 | 1.1% | | 40.9% | 14 | 2.0% | 11 |
| Portland | | | | | 2.07% | 31 | 0.32% | | | | | | | |
| Princeton | 218 | 9 | 71 | 1 | | | | | 1.6% | 17 | 23.1% | 25 | 1.6% | |
| Pseudo port code for Columbia River | 190 | 10 | 24 | 21 | | | | | 0.9% | | | | | |
| Pt Townsend | 45 | | 6 | | 0.12% | | | | 0.2% | | 0.3% | | | |
| Raymond | | | | | 1.01% | | | | | | | | | |
| Reedsport | | | | | 1.55% | | 1.27% | 66 | | | | | | |
| Richmond | 9 | | 9 | | 0.16% | | 0.28% | | | | | | | |
| Salem | | | | | 1.25% | | 0.32% | | | | | | | |
| Salkum | | | | | 0.24% | | 2.60% | 26 | | | | | | |
| San Diego | 59 | | 28 | 17 | 5.12% | 12 | 2.55% | 31 | 0.3% | | 6.3% | | 0.1% | |
| San Francisco | 282 | 3 | 48 | 5 | 1.91% | 36 | 2.70% | 23 | 2.0% | 14 | 33.6% | 18 | 2.9% | 9 |
| San Jose | | | | | 1.19% | | 0.57% | | | | | | | |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| San Luis Obispo | | | | | 0.31% | | 0.99% | 71 | | | | | | | |
| San Pedro | 116 | 16 | 38 | 11 | 2.38% | 21 | 1.28% | 61 | 2.4% | 9 | 0.4% | | | | |
| Santa Barbara | 153 | 13 | 51 | 4 | 5.40% | 8 | 5.39% | 12 | 1.9% | 15 | 3.1% | | 0.2% | | |
| Santa Cruz | 120 | 15 | 38 | 11 | 1.60% | | 1.13% | 69 | 0.5% | | 7.8% | | 0.2% | | |
| Santa Maria | | | | | 0.32% | | 1.56% | 47 | | | | | | | |
| Sausalito | 24 | | 7 | | 0.40% | | 0.14% | | | | | | | | |
| Seaside | | | | | 0.52% | | 1.42% | 48 | | | | | | | |
| Seattle | 114 | 17 | 22 | 23 | 7.11% | 6 | 27.92% | 1 | 0.5% | | 16.0% | | 0.4% | | |
| Sequim | 11 | | 4 | | 1.30% | | 0.65% | | | | | | | | |
| Shelton | 7 | | 2 | | 0.53% | | 0.65% | | | | | | | | |
| Siletz | | | | | 1.86% | | 2.55% | 32 | | | | | | | |
| South Beach | | | | | 1.55% | | 1.91% | 42 | | | | | | | |
| South Bend | | | | | 1.54% | | 2.60% | 27 | | | | | | | |
| Tacoma | 32 | | 10 | | 1.72% | | | | 0.1% | | | | | | |
| Terminal Island | 116 | 16 | 35 | 13 | 0.01% | | | | 2.2% | 12 | 2.7% | | 0.2% | | |
| Tillamook | 166 | 12 | 27 | 18 | 1.08% | | 0.32% | | 1.5% | | 2.3% | | 0.1% | | |
| Tokeland | | | | | 1.72% | | | | | | | | | | |
| Toledo | | | | | 1.94% | 35 | 2.23% | 34 | | | | | | | |
| Tomales Bay | 2 | | 2 | | | | | | | | | | | | |
| Trinidad | 22 | | 12 | | 0.45% | | 0.57% | | 0.4% | | 2.7% | | 0.1% | | |
| Ventura | 61 | | 29 | 16 | 2.26% | 25 | 0.85% | | 2.1% | 13 | 0.2% | | | | |
| Waldport | 7 | | 5 | | 0.65% | | | | | | | | | | |
| Warrenton | | | | | 3.41% | 16 | 3.18% | 20 | | | | | | | |
| Westport | 269 | 4 | 45 | 7 | 8.47% | 2 | 5.84% | 9 | 14.6% | 1 | 14.5% | | 9.0% | 4 | |
| Willapa Bay | 104 | 20 | 15 | | | | | | 1.5% | 18 | | | | | |
| Willmington | 13 | | 9 | | | | | | | | 61.9% | 6 | 0.1% | | |
| Winchester Bay | 75 | 28 | 23 | 22 | 0.86% | | | | 0.7% | | 1.9% | | 0.1% | | |
| Yachats | 1 | | 1 | | 0.22% | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

Note: Blank spaces indicate that the value for the particular indicator is zero or very close to zero (less than 0.01%).

Note: When the data available grouped two cities together, the data was analyzed and associated with only one of the two cities. Under the grouping Ilwaco/Chinook, data was associated with Ilwaco.

Under the grouping Tillamook/Garibaldi, data was associated with Tillamook. Under the grouping Princeton/Half Moon Bay, data was associated with Princeton.

Note: An asterix (*) denotes confidential data.

Note: Total number of vessels indicates the number of vessels who made at least one landing at the port.

Not appropriate to sum vessels across ports, as some vessels make landings in multiple ports.

Note: Total number of dealers indicates the number of dealers who made at least one purchase at the port.

Not appropriate to sum vessels across ports, as some vessels make landings in multiple ports.

Note: Blank spaces in the rankings columns indicate that this city did not score in the top one-third of cities with a value under the indicator.

**Table A.4-18. Commercial indicators and rankings by county**

| County | Total Number of Vessels Participating in Any Fishery in 2005 by County | Rank | Dealers | Rank | Permits as percentage of state total | Rank | Groundfish permits a percentage of state total | Rank | County fish revenue/ Coastwide fish revenue | Rank | County groundfish revenue/ County fish revenue | Rank | County groundfish revenue/ Coastwide groundfish revenue | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alameda County | | | | | 1.4% | 25 | 1.5% | | | | | | | |
| Benton County | | | | | 0.1% | | | | | | | | | |
| Butte County | | | | | 0.2% | | 0.3% | | | | | | | 8 |
| Clackamas County | | | | | 0.5% | | 1.6% | 19 | | | | | | |
| Clallam County | 115 | | 15 | | 0.6% | | 1.4% | | 1.3% | | 0.9% | 5 | 2.5% | |
| Clark County | | | | | 0.2% | | 0.1% | | | | | | | |
| Clatsop County | 274 | 6 | 28 | | 3.6% | 11 | 3.7% | 11 | 7.3% | 3 | 1.2% | 3 | 18.2% | |
| Columbia County | | | | | 0.4% | | | | | | | | | |
| Contra Costa County | | | | | 1.2% | | 0.4% | | | | | | | |
| Coos County | 399 | 2 | 40 | 11 | 2.9% | 15 | 2.9% | 13 | 4.7% | 8 | 0.9% | 7 | 8.2% | |
| Cowlitz County | | | | | 0.3% | | | | | | | | | |
| Curry County | 194 | 10 | 27 | | 3.6% | 10 | 9.5% | 2 | 2.4% | | 0.9% | 6 | 4.2% | |
| Del Norte County | 134 | | 20 | | 3.3% | 12 | 5.7% | 4 | 4.1% | 10 | 0.3% | | 2.2% | |
| Deschutes County | | | | | 0.1% | | | | | | | | | 9 |
| Douglas County | 75 | | 23 | | 0.6% | | 0.4% | | 0.5% | | 0.1% | | 0.1% | |
| El Dorado County | | | | | 0.2% | | | | | | | | | |
| Fresno County | | | | | 0.2% | | | | | | | | | |
| Grays Harbor County | 280 | 4 | 46 | 8 | 2.4% | 17 | 2.0% | 18 | 5.8% | 6 | 0.8% | 8 | 9.0% | |
| Hood River County | | | | | 0.1% | | | | | | | | | |
| Humboldt County | 135 | | 37 | 12 | 4.2% | 8 | 4.1% | 9 | 3.7% | 11 | 0.7% | | 5.0% | |
| Island County | | | | | 0.2% | | 0.2% | | | | | | | |
| Jackson County | | | | | 0.1% | | | | | | | | | |
| Jefferson | 45 | | 6 | | 0.2% | | | | 0.2% | | 0.0% | | 0.0% | |
| Josephine County | | | | | 0.1% | | | | | | | | | |
| Kern County | | | | | 0.3% | | 0.3% | | | | | | | |
| King County | 114 | | 22 | | 1.6% | 22 | 5.1% | 6 | 2.8% | | 0.1% | | 0.4% | |
| Kitsap County | | | | | 0.2% | | 0.5% | | | | | | | |
| Klamath County | | | | | 0.1% | | 0.1% | | | | | | | |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lake County | | | | | 0.2% | | | | | | | | | |
| Lane County | 18 | | 14 | | 0.6% | | 0.3% | | 0.2% | | 0.0% | | 0.0% | |
| Lewis County | | | | | 0.3% | | 0.5% | | | | | | | |
| Lincoln County | 464 | 1 | 79 | 1 | 3.2% | 13 | 4.5% | 8 | 6.4% | 5 | 1.3% | 2 | 16.9% | |
| Los Angeles County | 145 | | 50 | 6 | 5.1% | 5 | 2.3% | 16 | 8.2% | 1 | 2.0% | 1 | 0.8% | 1 |
| Marin County | 149 | | 37 | 12 | 2.0% | 19 | 0.9% | | 1.5% | | 0.0% | | 0.1% | |
| Marion County | | | | | 0.3% | | 0.4% | | | | | | | |
| Mason County | 7 | | 2 | | 0.1% | | 0.1% | | * | | * | | * | |
| Mendocino County | 275 | 5 | 51 | 5 | 5.2% | 3 | 6.1% | 3 | 3.3% | | 0.6% | | 4.0% | |
| Monterey County | 183 | | 41 | 10 | 4.3% | 7 | 3.5% | 12 | 1.7% | | 0.2% | | 1.2% | |
| Multnomah County | | | | | 0.4% | | 0.1% | | | | | | | |
| Nevada County | | | | | 0.1% | | 0.1% | | | | | | | |
| Okanogan County | | | | | | | 0.2% | | | | | | | |
| Orange County | 145 | | 50 | 6 | 3.0% | 14 | 4.7% | 7 | 8.2% | 2 | 0.0% | | 0.8% | |
| Pacific County | 246 | 7 | 30 | | 2.0% | 20 | 0.9% | | 4.3% | 9 | 0.4% | | 3.1% | 6 |
| Pierce County | 32 | | 10 | | 0.7% | | 0.4% | | 0.4% | | 0.0% | | 0.0% | |
| Placer County | | | | | 0.2% | | | | | | | | | |
| Polk County | | | | | 0.1% | | 0.3% | | | | | | | |
| Riverside County | | | | | 0.2% | | | | | | | | | |
| Sacramento County | | | | | 0.8% | | 0.1% | | | | | | | |
| San Benito County | | | | | 0.1% | | | | | | | | | |
| San Bernardino County | | | | | 0.2% | | | | | | | | | |
| San Diego County | 122 | | 54 | 3 | 5.7% | 1 | 2.8% | 14 | 5.7% | 7 | 0.1% | | 1.1% | |
| San Francisco Bay County | 242 | 8 | 66 | 2 | 1.3% | | 1.6% | | 0.2% | | 0.0% | | 0.0% | |
| San Joaquin County | | | | | 0.3% | | 0.1% | | | | | | | |
| San Juan County | | | 6 | | 0.3% | | 0.3% | | 2.1% | | 0.6% | | 2.4% | 2 |
| San Luis Obispo County | 154 | | 53 | 4 | 5.2% | 4 | 10.4% | 1 | 2.7% | | 0.2% | | 2.8% | |
| San Mateo County | 242 | 9 | 66 | 2 | 2.6% | 16 | 2.4% | 15 | 2.7% | | 0.2% | | 2.8% | |
| Santa Barbara County | 136 | | 47 | 7 | 5.3% | 2 | 5.5% | 5 | 3.5% | | 0.1% | | 0.4% | |
| Santa Clara County | | | | | 1.4% | 24 | 0.4% | | | | | | | |
| Santa Cruz County | 183 | | 41 | 10 | 2.2% | 18 | 1.1% | | 1.7% | | 0.2% | | 1.2% | |
| Shasta County | | | | | 0.1% | | | | | | | | | |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Skagit County | 162 | | 24 | | 1.1% | | 0.3% | | 1.3% | | 0.0% | | 0.0% | |
| Snohomish County | 47 | | 8 | | 0.7% | | 0.5% | | 0.7% | | 0.8% | | 1.1% | |
| Solano County | | | | | 0.4% | | | | | | | | | |
| Sonoma County | 149 | | 37 | 12 | 3.7% | 9 | 1.1% | | 1.5% | | 0.0% | | 0.1% | 4 |
| Stanislaus County | | | | | 0.1% | | | | | | | | | |
| Tehama County | | | | | 0.1% | | | | | | | | | |
| Thurston | 2 | | 2 | | 0.2% | | 0.1% | | * | | * | | * | |
| Tillamook County | 187 | 11 | 33 | | 1.5% | 23 | 2.1% | 17 | 1.0% | | 0.1% | | 0.2% | |
| Tulare County | | | | | 0.1% | | | | | | | | | |
| Tuolumne County | | | | | | | 0.1% | | | | | | | |
| Umatilla County | | | | | | | 0.3% | | | | | | | 3 |
| Ventura County | 136 | | 47 | 7 | 4.6% | 6 | 4.0% | 10 | 3.5% | | 0.1% | | 0.4% | 5 |
| Wahkiakum County | | | | | 0.4% | | | | 6.4% | 4 | 0.9% | 4 | 12.2% | |
| Washington County | | | | | 0.3% | | 0.3% | | | | | | | |
| Whatcom County | 303 | 3 | 43 | 9 | 1.9% | 21 | 0.7% | | | | | | | 7 |
| Yamhill County | | | | | 0.2% | | 0.1% | | | | | | | |
| Yolo County | | | | | 0.2% | | | | | | | | | |
| Yuba County | | | | | 0.1% | | 0.4% | | | | | | | |
| Note: An asterix (*) indicates confidential data | | | | | | | | | | | | | | |

**Table A.4-19. Commercial fishing engagement scores by city**

| City | Number of times the city scored in top one-third of commercial fishing engagement indicators |
|---|---|
| Astoria | 4 |
| Bellingham | 4 |
| Coos Bay | 4 |
| Crescent City | 4 |
| Eureka | 4 |
| Fort Bragg | 4 |
| Ilwaco | 4 |
| Newport | 4 |
| San Francisco | 4 |
| San Pedro | 4 |
| Santa Barbara | 4 |
| Westport | 4 |
| Anacortes | 3 |
| Bodega Bay | 3 |
| Brookings | 3 |
| Monterey | 3 |
| Morro Bay | 3 |
| Moss Landing | 3 |
| Oxnard | 3 |
| Princeton | 3 |
| Seattle | 3 |
| Terminal Island | 3 |
| Ventura | 3 |
| Avila | 2 |
| Blaine | 2 |
| Oth Orange/LA cnty ports | 2 |
| Other Col R ports | 2 |
| Port Orford | 2 |
| Pseudo port code for Columbia River | 2 |
| San Diego | 2 |
| Santa Cruz | 2 |
| Tillamook | 2 |
| Willapa Bay | 2 |
| Winchester Bay | 2 |
| Aberdeen | 1 |
| Bandon | 1 |
| Berkeley | 1 |
| Cathlamet | 1 |
| Charleston | 1 |
| Chinook | 1 |
| Dana Point | 1 |
| Ferndale | 1 |
| Florence | 1 |
| Garibaldi | 1 |
| Gold Beach | 1 |
| Harbor | 1 |
| La Conner | 1 |
| Newport Beach | 1 |
| North Bend | 1 |
| Oth Humboldt cnty ports | 1 |
| Oth Marin/Sonoma outer coast ports | 1 |
| Oth San Diego cnty ports | 1 |

| | |
|---|---|
| Oth SFBay/San Mateo cnty ports | 1 |
| Point Arena | 1 |
| Port Angeles | 1 |
| Port Hueneme | 1 |
| Portland | 1 |
| Toledo | 1 |
| Warrenton | 1 |

**Table A.4-20. Commercial fishing engagement scores by county**

| County | Number of times the county scored in top one-third of commercial fishing engagement indicators |
|---|---|
| Coos County | 4 |
| Grays Harbor County | 4 |
| Lincoln County | 4 |
| Clatsop County | 3 |
| Humboldt County | 3 |
| Los Angeles County | 3 |
| Mendocino County | 3 |
| Orange County | 3 |
| Pacific County | 3 |
| San Diego County | 3 |
| San Mateo County | 3 |
| Whatcom County | 3 |
| Curry County | 2 |
| Del Norte County | 2 |
| Marin County | 2 |
| Monterey County | 2 |
| San Francisco Bay County | 2 |
| San Luis Obispo County | 2 |
| Santa Barbara County | 2 |
| Santa Cruz County | 2 |
| Sonoma County | 2 |
| Tillamook County | 2 |
| Ventura County | 2 |
| Alameda County | 1 |
| King County | 1 |
| Santa Clara County | 1 |
| Wahkiakum County | 1 |

**Table A.4-21. Groundfish dependency scores by city**

| City | Number of times the city scored in top one-third of commercial groundfish dependency indicators |
|---|---|
| Astoria | 3 |
| Bellingham | 3 |
| Brookings | 3 |
| Coos Bay | 3 |

| | |
|---|---|
| Crescent City | 3 |
| Eureka | 3 |
| Fort Bragg | 3 |
| Morro Bay | 3 |
| Newport | 3 |
| Port Orford | 3 |
| San Francisco | 3 |
| Blaine | 2 |
| Gold Beach | 2 |
| Moss Landing | 2 |
| Neah Bay | 2 |
| Pacific City | 2 |
| Port Angeles | 2 |
| Westport | 2 |
| Aberdeen | 1 |
| Albion | 1 |
| Arroyo Grande | 1 |
| Atascadero | 1 |
| Avila | 1 |
| Bandon | 1 |
| Bodega Bay | 1 |
| Cambria | 1 |
| Charleston | 1 |
| Chinook | 1 |
| Clackamas | 1 |
| Costa Mesa | 1 |
| Edmonds | 1 |
| El Granada | 1 |
| Everett | 1 |
| Florence | 1 |
| Garibaldi | 1 |
| Gig Harbor | 1 |
| Goleta | 1 |
| Half Moon Bay | 1 |
| Hammond | 1 |
| Harbor | 1 |
| Huntington Beach | 1 |
| Ilwaco | 1 |
| La Push | 1 |
| Lake Forest | 1 |
| Lake Forest Park | 1 |
| Los Osos | 1 |
| Mckinleyville | 1 |
| Monterey | 1 |
| Newport Beach | 1 |
| North Bend | 1 |
| Oakland | 1 |
| Oceanside | 1 |
| Oth Monterey/Sta Cruz cnty ports | 1 |
| Oth Orange/LA cnty ports | 1 |
| Oth San Diego cnty ports | 1 |
| Oxnard | 1 |
| Point Arena | 1 |

| | |
|---|---|
| Princeton | 1 |
| Reedsport | 1 |
| Salkum | 1 |
| San Diego | 1 |
| San Luis Obispo | 1 |
| San Pedro | 1 |
| Santa Barbara | 1 |
| Santa Cruz | 1 |
| Santa Maria | 1 |
| Seaside | 1 |
| Seattle | 1 |
| Siletz | 1 |
| South Beach | 1 |
| South Bend | 1 |
| Toledo | 1 |
| Warrenton | 1 |
| Willmington | 1 |

**Table A.4-22. Groundfish dependency scores by county**

| County | Number of times the county scored in top one-third of commercial groundfish dependency indicators |
|---|---|
| Los Angeles County | 3 |
| Clatsop County | 2 |
| Coos County | 2 |
| Curry County | 2 |
| Grays Harbor County | 2 |
| Lincoln County | 2 |
| Ventura County | 2 |
| Butte County | 1 |
| Clackamas County | 1 |
| Clallam County | 1 |
| Del Norte County | 1 |
| Deschutes County | 1 |
| Humboldt County | 1 |
| King County | 1 |
| Mendocino County | 1 |
| Monterey County | 1 |
| Orange County | 1 |
| Pacific County | 1 |
| San Diego County | 1 |
| San Juan County | 1 |
| San Luis Obispo County | 1 |
| San Mateo County | 1 |
| Santa Barbara County | 1 |
| Sonoma County | 1 |
| Tillamook County | 1 |
| Umatilla County | 1 |
| Wahkiakum County | 1 |
| Whatcom County | 1 |

**Table A.4-23. California charter vessels ranked by region**

| Region - CA | Number of charter vessels in California as a percentage of the state total | Rank |
|---|---|---|
| San Diego Mission Bay (includes boats going to Mexico) | 28.6% | 1 |
| San Fran, San Fran Bay-Delta | 13.9% | 2 |
| Seal Beach, Long Beach, San Pedro | 13.3% | 3 |
| Port Hueneme, Oxnard/Ventura, Santa Barbara | 9.4% | 4 |
| Princeton, Bodega Bay | 8.0% | 5 |
| Oceanside Dana Harbor | 6.2% | 6 |
| Monterey, Moss Landings, Santa Cruz | 5.6% | 7 |
| Newport Beach | 5.3% | 8 |
| Fort Bragg, Eureka, Crescent City | 4.1% | 9 |
| Redondo, Mr del Rey, Malibu | 3.8% | 10 |
| Avila Beach, Morro Bay | 1.8% | 11 |

**Table A.4-24. California recreational indicator values and rankings by region**

| County Group - CA | Private/rental angler trips as a percentage of state total | Rank | Private/rental groundfish angler trips as a percentage of state total | Rank | Party/charter trips as a percentage of state total | Rank | Party/charter groundfish trips as a percentage of state total | Rank |
|---|---|---|---|---|---|---|---|---|
| San Diego through LA | 39.4% | 1 | 12.3% | 5 | 53.5% | 1 | 40.8% | 1 |
| San Luis Obispo through Santa Cruz | 11.2% | 2 | 23.4% | 1 | 6.1% | 5 | 17.3% | 2 |
| Sonoma and Mendocino | 9.8% | 3 | 19.9% | 3 | 12.6% | 2 | 1.9% | 5 |
| Humbolt and Del Norte | 9.3% | 4 | 20.5% | 2 | 0.3% | 6 | 0.8% | 6 |
| San Mateo up through Marin | 7.4% | 5 | 14.1% | 4 | 7.7% | 3 | 16.5% | 3 |
| Ventura and Santa Barabara | 5.1% | 6 | 4.4% | 6 | 7.0% | 4 | 13.8% | 4 |

**Table A.4-25. Oregon and Washington recreational indicator values and rankings by city**

| Port - OR/WA | Number of charter vessels as a percentage of total charter vessels in state | Rank | Private/rental angler trips as a percentage of state total | Rank | Private/rental groundfish angler trips as a percentage of state total | Rank | Party/charter trips as a percentage of state total | Rank | Party/charter groundfish trips as a percentage of state total | Rank |
|---|---|---|---|---|---|---|---|---|---|---|
| Astoria, Hammond and Warrenton | 20.2% | 3 | 9.6% | 6 | 0.7% | | 4.9% | | 0.1% | |
| Bandon | 3.0% | | 1.3% | | 3.0% | | 3.3% | | 3.5% | |
| Brookings | 6.1% | | 21.4% | 1 | 36.1% | 1 | 6.8% | 5 | 9.0% | 4 |
| Charleston | 6.1% | | 10.5% | 5 | 11.4% | 3 | 6.5% | 6 | 8.0% | 5 |
| Depoe Bay | 16.2% | 5 | 4.8% | | 5.7% | | 24.6% | 2 | 28.2% | 2 |
| Florence | | | 0.9% | | 0.1% | | 0.0% | | 0.0% | |
| Garibaldi | 12.1% | | 11.5% | 4 | 6.3% | 6 | 13.2% | 3 | 12.5% | 3 |
| Gold Beach | 4.0% | | 2.7% | | 8.9% | 5 | 2.3% | | 3.2% | |
| Ilwaco/Chinook | 5.8% | | 8.6% | | 0.2% | | 3.8% | | 0.4% | |
| Lapush | 45.3% | 1 | 1.1% | | 0.5% | | 0.2% | | 0.1% | |
| Neah Bay | 33.7% | 2 | 5.4% | | 4.1% | | 1.0% | | 0.3% | |
| Newport | 19.2% | 4 | 17.7% | 2 | 14.6% | 2 | 31.9% | 1 | 33.4% | 1 |
| Pacific City | 4.0% | | 5.0% | | 10.5% | 4 | 1.6% | | 1.6% | |
| Port Orford | 3.0% | | 0.8% | | 1.9% | | 0.5% | | 0.5% | |
| Westport | 15.1% | | 2.7% | | 0.6% | | 7.9% | 4 | 7.9% | 6 |
| Winchester Bay | 6.1% | | 13.8% | 3 | 0.8% | | 4.4% | | 0.0% | |
| | | | | | | | | | | |

Note: Blank space under indicator columns indicate that no data was available in this category for a particular port.
Note: Blank space under rank columns indicate that the city did not rank in the top one-third.

**Table A.4-26. California recreational engagement scores by region**

| County Group - CA | Number of times the county group scored in top one-third of CA recreational fishing engagement indicators |
|---|---|
| San Diego through LA | 3 |
| San Luis Obispo through Santa Cruz | 3 |
| Sonoma and Mendocino | 1 |
| Humboldt and Del Norte | 1 |

**Table A.4-27. Oregon and Washington recreational engagement scores by city**

| Port - OR/WA | Number of times the port scored in top one-third of OR/WA recreational fishing engagement indicators |
|---|---|
| Newport | 5 |
| Brookings | 4 |
| Charleston | 4 |
| Garibaldi | 4 |
| Depoe Bay | 3 |
| Astoria, Hammond and Warrenton | 2 |
| Westport | 2 |
| Gold Beach | 1 |
| Lapush | 1 |
| Neah Bay | 1 |
| Pacific City | 1 |
| Winchester Bay | 1 |

### *A.4.5 Resiliency Results*

Table A.4-18 shows resiliency indicators and the values for cities data was available for as well as the rankings of cities that were in the top one-third of each indicator. Table A.4-19 shows the indicators and values for a range of counties data was available for and rankings of counties that were in the top one-third of each indicator. Table A.4-20 shows the number of times each city scored in the top one-third of the five resiliency indicators. Netarts, Neah Bay, La Push, and Copalis Beach scored in the top one-third of all categories and could be described as relatively least resilient according to this analysis. Moss Landing and Winchester ranked in the top one-third of four out of five indicators. Waldport, Trinidad, Ilwaco, Garibaldi, and Chinook also scored highly (three out of five indicators). Garibaldi, is classified as a "severely distressed city" by the state of Oregon (see Table A.4-6). Netarts, Neah Bay, La Push and Copalis Beach are all identified as isolated cities.

Table A.4-21 displays the number of times each county scored in the top one-third of the five resiliency indicators. Del Norte, Grays Harbor, Hood River and Lincoln counties ranked in the top one-third of all resiliency indicators (isolated communities indicator does not apply to counties). Coos, Cowlitz, Humboldt, Medocino, Pacific, Skamania, and Wahkiakum counties can also be described as relatively least resilient according to this analysis.

**Table A.4-28. Resiliency indicator values and rankings by city**

| Port | Industry diversification index (Shannon-Weiner Index) | Rank | Total population | Rank | Unemployment rate | Rank | Poverty rate | Rank | Isolated City |
|---|---|---|---|---|---|---|---|---|---|
| Aberdeen | 2.340 | | 16,461 | | 5.8% | 9 | 22.2% | 7 | |
| Anacortes | 2.243 | | 14,557 | | 2.9% | | 7.7% | | |
| Astoria | 2.452 | | 9,813 | | 4.3% | 23 | 15.9% | 24 | |
| Bandon | 2.140 | 22 | 2,833 | | 3.5% | | 16.0% | 23 | |
| Bellingham | 2.528 | | 67,171 | | 6.8% | 6 | 20.6% | 10 | |
| Berkeley | 2.466 | | 102,743 | | 3.6% | | 20.0% | 12 | |
| Blaine | 2.421 | | 3,770 | | 4.0% | | 15.5% | | |
| Bodega Bay | 1.473 | 7 | 1,423 | 20 | 1.4% | | 4.0% | | |
| Brookings | 2.360 | | 5,447 | | 3.2% | | 11.5% | | |
| Cannon Beach | 1.588 | 8 | 1,588 | 21 | 3.1% | | 12.0% | | |
| Chinook | 1.217 | 3 | 457 | 5 | 1.8% | | 18.2% | 16 | |
| Coos Bay | 2.408 | | 15,374 | | 5.4% | 13 | 16.5% | 20 | |
| Copalis Beach | 1.403 | 5 | 489 | 8 | 7.9% | 4 | 17.4% | 18 | yes |
| Crescent City | 2.302 | | 4,006 | | 6.5% | 8 | 34.6% | 1 | |
| Dana Point | 1.974 | 17 | 35,110 | | 2.6% | | 6.7% | | |
| Depoe Bay | 1.623 | 9 | 1,174 | 19 | 2.9% | | 8.0% | | |
| Eureka | 2.363 | | 26,128 | | 5.5% | 12 | 23.7% | 5 | |
| Everett | 2.505 | | 91,488 | | 5.3% | 14 | 12.9% | | |
| Florence, OR | 2.286 | | 7,263 | | 3.9% | | 14.4% | | |
| Fort Bragg | 2.209 | | 7,026 | | 5.3% | 15 | 20.4% | 11 | |
| Friday Harbor | 2.486 | | 1,989 | 23 | 3.5% | | 12.0% | | |
| Garibaldi | 1.739 | 10 | 899 | 14 | 4.2% | 24 | 11.6% | | |
| Gold Beach | 2.366 | | 1,897 | 22 | 2.1% | | 12.4% | | |
| Half Moon Bay | 2.282 | | 11,842 | | 2.6% | | 6.1% | | |
| Hood River | 2.422 | | 5,831 | | 5.1% | 17 | 17.3% | 19 | |
| Ilwaco | 1.787 | 11 | 950 | 15 | 3.7% | | 16.3% | 21 | |
| La Conner | 2.153 | 23 | 761 | 11 | 1.9% | | 11.8% | | |
| La Push | 0.000 | 1 | 371 | 4 | 16.1% | 2 | 34.5% | 2 | yes |
| Long Beach | 2.623 | | 461,522 | | 5.8% | 9 | 22.8% | 6 | |
| Los Angeles | 2.626 | | 3,694,820 | | 5.6% | 11 | 22.1% | 8 | |
| Monterey | 2.550 | | 29,674 | | 2.2% | | 7.8% | | |
| Morro Bay | 2.092 | 18 | 10,350 | | 2.0% | | 13.0% | | |
| Moss Landing | 1.820 | 12 | 300 | 2 | 17.4% | 1 | 18.8% | 15 | |
| Neah Bay | 1.852 | 14 | 794 | 12 | 16.0% | 3 | 29.9% | 3 | yes |
| Nehalem | 2.120 | 21 | 203 | 1 | 1.5% | | 7.7% | | |
| Netarts | 0.553 | 2 | 744 | 10 | 5.2% | 16 | 17.3% | 19 | yes |
| Newport | 2.285 | | 9,532 | | 5.7% | 10 | 14.4% | | |
| Newport Beach | 2.481 | | 70,032 | | 2.0% | | 4.4% | | |
| Oakland | 2.667 | | 399,484 | | 5.1% | 18 | 19.4% | 13 | |
| Oceanside | 2.415 | | 161,029 | | 3.4% | | 11.6% | | yes |
| Olympia | 2.516 | | 42,514 | | 3.3% | | 12.1% | | |
| Oxnard | 2.469 | | 170,358 | | 4.7% | 21 | 15.1% | | |
| Pacific City | 1.403 | 6 | 1,027 | 16 | 4.0% | | 7.9% | | |
| Point Arena | 2.270 | | 474 | 6 | 2.1% | | 26.0% | 4 | |
| Point Reyes St | 2.239 | | 818 | 13 | 1.1% | | 6.6% | | |
| Port Angeles | 2.355 | | 18,397 | | 4.7% | 21 | 13.2% | | |
| Port Hueneme | 2.377 | | 21,845 | | 3.2% | | 12.2% | | |
| Port Orford | 2.160 | | 1,153 | 18 | 3.5% | | 17.8% | 17 | |
| Port Townsend | 2.396 | | 8,334 | | 4.3% | 23 | 14.0% | | |
| Portland | 2.670 | | 529,121 | | 4.5% | 22 | 13.1% | | |
| Richmond | 2.519 | | 99,216 | | 4.8% | 20 | 16.2% | 22 | |
| San Diego | 2.618 | | 1,223,400 | | 3.8% | | 14.6% | | |
| San Francisco | 2.609 | | 776,733 | | 3.0% | | 11.3% | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| San Pedro | 2.429 | | 79,886 | | 4.0% | | 16.5% | 20 | |
| Santa Barbara | 2.602 | | 92,325 | | 3.9% | | 13.4% | | |
| Santa Cruz | 2.514 | | 54,593 | | 4.2% | 24 | 16.5% | 20 | |
| Seaside | 2.114 | 20 | 5,900 | | 2.6% | | 15.6% | | |
| Seattle | 2.674 | | 563,374 | | 3.6% | | 11.8% | | |
| Sequim | 2.435 | | 4,334 | | 2.0% | | 13.9% | | |
| Shelton | 2.466 | | 8,442 | | 4.9% | 19 | 18.9% | 14 | |
| Siletz | 2.099 | 19 | 1,133 | 17 | 3.2% | | 15.4% | | |
| Tacoma | 2.595 | | 193,556 | | 4.9% | 19 | 15.9% | 24 | |
| Tillamook | 2.375 | | 4,352 | | 2.6% | | 15.4% | | |
| Trinidad | 1.917 | 15 | 311 | 3 | 4.2% | 24 | 8.8% | | |
| Ventura | 2.603 | | 100,916 | | 3.3% | | 9.0% | | |
| Waldport | 2.213 | | 2,050 | 24 | 7.9% | 5 | 17.3% | 19 | |
| Warrenton | 2.159 | 24 | 4,096 | | 2.3% | | 14.2% | | |
| Westport | 1.836 | 13 | 2,137 | | 4.1% | | 14.3% | | |
| Winchester | 1.921 | 16 | 488 | 7 | 6.7% | 7 | 21.3% | 9 | |
| Yachats | 1.348 | 4 | 617 | 9 | 2.5% | | 14.1% | | |
| | | | | | | | | | |
| Note: Blank spaces in the rankings columns indicate that this city did not score in the top one-third. | | | | | | | | | |

**Table A.4-29. Resiliency indicator values and rankings by county**

| County | Industry diversification index (Shannon-Weiner Index) | Rank | Total population | Rank | Unemployment rate | Rank | Poverty rate | Rank |
|---|---|---|---|---|---|---|---|---|
| Alameda | 2.50 | | 1443741 | | 3.6 | | 11 | |
| Clallam | 2.25 | 9 | 64525 | 15 | 3.9 | | 12.5 | |
| Clark | 2.38 | | 345238 | | 4 | | 9.1 | |
| Clatsop | 2.15 | 4 | 35630 | 10 | 4.1 | | 13.2 | |
| Columbia | 2.06 | 2 | 43560 | 11 | 4.1 | | 9.1 | |
| Contra Costa | 2.50 | | 948816 | | 3.1 | | 7.6 | |
| Coos | 2.36 | | 62779 | 14 | 4.6 | 12 | 15 | 7 |
| Cowlitz | 2.29 | 13 | 92948 | | 4.7 | 11 | 14 | 13 |
| Curry | 2.27 | 11 | 21137 | 6 | 3.6 | | 12.2 | |
| Del Norte | 2.22 | 7 | 27507 | 9 | 4.9 | 7 | 20.2 | 1 |
| Douglas | 2.31 | 15 | 100399 | | 4.3 | | 13.1 | |
| Grays Harbor | 2.26 | 10 | 67194 | 16 | 4.8 | 10 | 16.1 | 5 |
| Hood River | 2.30 | 14 | 20411 | 4 | 4.4 | 16 | 14.2 | 12 |
| Humboldt | 2.28 | 12 | 126518 | | 5.2 | 3 | 19.5 | 2 |
| Island | 2.27 | 11 | 71558 | 17 | 3 | | 7 | |
| Jefferson | 2.25 | 9 | 25953 | 8 | 3.6 | | 11.3 | |
| King | 2.55 | | 606024 | | 3.5 | | 6.9 | |
| Kitsap | 2.27 | 11 | 231969 | | 3.5 | | 8.8 | |
| Lane | 2.36 | | 322959 | | 4.1 | | 14.4 | 8 |
| Lincoln | 2.17 | 6 | 44479 | 12 | 4.9 | 8 | 13.9 | 14 |
| Los Angeles | 2.48 | | 9519338 | | 5 | 6 | 17.9 | 3 |
| Marin | 2.44 | | 247289 | | 1.9 | | 6.6 | |
| Mason | 2.35 | | 49405 | 13 | 4.5 | 14 | 12.2 | |
| Mendocino | 2.30 | 14 | 86265 | | 4.5 | 15 | 15.9 | 6 |
| Monterey | 2.42 | | 401762 | | 5.2 | 5 | 13.5 | 16 |
| Multnomah | 2.55 | | 660486 | | 4.4 | | 12.7 | |
| Orange | 2.52 | | 2846289 | | 3.3 | | 10.3 | |
| Pacific | 2.14 | 3 | 20984 | 5 | 3.9 | | 14.4 | 9 |
| Pierce | 2.39 | | 700820 | | 4.1 | | 10.5 | |
| San Diego | 2.47 | | 2813833 | | 3.6 | | 12.4 | |
| San Francisco | 2.47 | | 776733 | | 3 | | 11.3 | |
| San Joaquin | 2.41 | | 563598 | | 6.2 | 2 | 17.7 | 4 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| San Juan | 2.38 | | 14077 | 3 | 1.9 | | 9.2 | |
| San Luis Obispo | 2.38 | | 401762 | | 5.2 | 4 | 13.5 | 15 |
| San Mateo | 2.53 | | 707161 | | 2.2 | | 5.8 | |
| Santa Barbara | 2.46 | | 399347 | | 4.2 | | 14.3 | 10 |
| Santa Cruz | 2.41 | | 255602 | | 4.1 | | 11.9 | |
| Skagit | 2.17 | 6 | 102979 | | 4.3 | | 11.1 | |
| Skamania | 2.03 | 1 | 9872 | 2 | 7.1 | 1 | 13.1 | |
| Snohomish | 2.30 | 14 | 606024 | | 3.5 | | 6.9 | |
| Solano | 2.33 | 16 | 394542 | | 3.8 | | 8.3 | |
| Sonoma | 2.39 | | 458614 | | 2.8 | | 8.1 | |
| Thurston | 2.33 | 16 | 207355 | | 3.9 | | 8.8 | |
| Tillamook | 2.23 | 8 | 24262 | 7 | 2.6 | | 11.4 | |
| Ventura | 2.43 | | 753197 | | 3.4 | | 9.2 | |
| Wahkiakum | 2.16 | 5 | 3824 | 1 | 4.5 | 13 | 8.1 | |
| Whatcom | 2.36 | | 166814 | | 4.9 | 9 | 14.2 | 11 |
| | | | | | | | | |
| Note: Blank spaces in the rankings columns indicate that this county did not score in the top one-third. | | | | | | | | |

**Table A.4-30. Resiliency scores by city**

| City | Number of times the city scored in top one-third (least resilient) of resiliency indicators |
|---|---|
| Copalis Beach | 5 |
| La Push | 5 |
| Neah Bay | 5 |
| Netarts | 5 |
| Moss Landing | 4 |
| Winchester | 4 |
| Chinook | 3 |
| Garibaldi | 3 |
| Ilwaco | 3 |
| Trinidad | 3 |
| Waldport | 3 |
| Aberdeen | 2 |
| Astoria | 2 |
| Bandon | 2 |
| Bellingham | 2 |
| Bodega Bay | 2 |
| Cannon Beach | 2 |
| Coos Bay | 2 |
| Crescent City | 2 |
| Depoe Bay | 2 |
| Eureka | 2 |
| Fort Bragg | 2 |
| Hood River | 2 |
| La Conner | 2 |
| Long Beach | 2 |
| Los Angeles | 2 |
| Nehalem | 2 |
| Oakland | 2 |
| Pacific City | 2 |
| Point Arena | 2 |
| Port Orford | 2 |

| | |
|---|---|
| Richmond | 2 |
| Santa Cruz | 2 |
| Shelton | 2 |
| Siletz | 2 |
| Tacoma | 2 |
| Yachats | 2 |
| Berkeley | 1 |
| Dana Point | 1 |
| Everett | 1 |
| Friday Harbor | 1 |
| Gold Beach | 1 |
| Morro Bay | 1 |
| Newport | 1 |
| Oceanside | 1 |
| Oxnard | 1 |
| Point Reyes St | 1 |
| Port Angeles | 1 |
| Port Townsend | 1 |
| Portland | 1 |
| San Pedro | 1 |
| Seaside | 1 |
| Warrenton | 1 |
| Westport | 1 |

**Table A.4-31. Resiliency scores by county**

| County | Number of times the county scored in top one-third (least resilient) of resiliency indicators |
|---|---|
| Del Norte | 4 |
| Grays Harbor | 4 |
| Hood River | 4 |
| Lincoln | 4 |
| Coos | 3 |
| Cowlitz | 3 |
| Humboldt | 3 |
| Mendocino | 3 |
| Pacific | 3 |
| Skamania | 3 |
| Wahkiakum | 3 |
| Clallam | 2 |
| Clatsop | 2 |
| Columbia | 2 |
| Curry | 2 |
| Island | 2 |
| Jefferson | 2 |
| Los Angeles | 2 |
| Mason | 2 |
| Monterey | 2 |
| San Joaquin | 2 |
| San Luis Obispo | 2 |
| Tillamook | 2 |
| Whatcom | 2 |
| Douglas | 1 |

| | |
|---|---|
| Kitsap | 1 |
| Lane | 1 |
| San Juan | 1 |
| Santa Barbara | 1 |
| Skagit | 1 |
| Snohomish | 1 |
| Solano | 1 |
| Thurston | 1 |

### *A.4.6 Vulnerable Areas Results*

Tables A.4-22 and A.4-23 show the results of the "vulnerable areas" analysis for cities and counties, respectively. Vulnerable areas are cities or counties that are with highly engaged (Tables A.4-9 and A.4-10) in or dependent on groundfish fishing (Tables A.4-11 and A.4-12), or recreational fishing (Tables A.4-16 and A.4-17) and are classified as least resilient according to Tables A.4-20 and A.4-21. That is, vulnerable areas are defined as cities that appear in Table A.4-9 and Table A.4-20 or Table A.4-11 and Table A.4-20 or Table A.4-17 and Table A.4-19 or counties that appear in Table A.4-10 and Table A.4-21, or Table A.4-12 and Table A.4-21. Thirty-eight cities and eighteen counties are identified as vulnerable areas in the last columns of Tables A.4-22 and A.4-23.

#### A.4.6.1 Commercial fishery

Vulnerable areas that are cities, as identified in this analysis, are bolded in Table A.4-22. With regard to engagement in commercial fishing, twenty-nine cities are identified as "vulnerable" or "most vulnerable" areas. The "most vulnerable" area label indicates the highest levels of engagement (or dependence) and the lowest levels of resilience. Ilwaco and Moss Landing are most vulnerable with regards to engagement in commercial fishing. Ilwaco and Moss Landing have the highest levels of engagement in fishing (score of four and three, respectively) and resiliency (score of three and four, respectively). Other vulnerable areas include Astoria, Bellingham, Coos Bay, Crescent City, Eureka, Fort Bragg, Ilwaco, Moss Landing, Port Orford, Santa Cruz and Winchester. All having high fishing engagement scores (two or greater) and low resiliency scores (two or greater). Newport, San Pedro and Westport all have high fishing engagement (score of four) but lower resiliency scores (score of one).

**Table A.4-32. Commercial and recreational scores and identification of vulnerable cities**

| City | Number of times the city scored in top one-third of commercial fishing engagement indicators | Number of times the city scored in top one-third of commercial groundfish dependency indicators | Number of times the port scored in top one-third of OR/WA recreational fishing engagement indicators | Number of times the city scored in top one-third (least resilient) of resiliency indicators | Vulnerable Area (vulnerable, most vulnerable) |
|---|---|---|---|---|---|
| **Aberdeen** | **1** | **1** | | **2** | **vulnerable** |
| Alameda | | | | | |
| Albion | | 1 | | | |
| Anacortes | 3 | | | | |
| Arroyo Grande | | 1 | | | |
| **Astoria** | **4** | **3** | **2** | **2** | **vulnerable** |
| Atascadero | | 1 | | | |
| Avalon | | | | | |
| Avila | 2 | 1 | | | |
| **Bandon** | **1** | **1** | | **2** | **vulnerable** |
| **Bellingham** | **4** | **3** | | **2** | **vulnerable** |
| **Berkeley** | **1** | | | **1** | **vulnerable** |
| Blaine | 2 | 2 | | | |
| **Bodega Bay** | **3** | **1** | | **2** | **vulnerable** |

| | | | | | |
|---|---|---|---|---|---|
| Brookings | 3 | 3 | 4 | | |
| Cambria | | 1 | | | |
| Cannon Beach | | | | 2 | |
| Cathlamet | 1 | | | | |
| Charleston | 1 | 1 | 4 | | |
| **Chinook** | **1** | **1** | | **3** | **vulnerable** |
| Clackamas | | 1 | | | |
| Clatskanie | | | | | |
| **Coos Bay** | **4** | **3** | | **2** | **vulnerable** |
| Copalis Beach | | | | 5 | |
| Costa Mesa | | 1 | | | |
| **Crescent City** | **4** | **3** | | **2** | **vulnerable** |
| **Dana Point** | **1** | | | **1** | **vulnerable** |
| **Depoe Bay** | | | **3** | **2** | **vulnerable** |
| Edmonds | | 1 | | | |
| El Granada | | 1 | | | |
| **Eureka** | **4** | **3** | | **2** | **vulnerable** |
| **Everett** | | **1** | | **1** | **vulnerable** |
| Ferndale | 1 | | | | |
| Fields Landing | | | | | |
| Florence | 1 | 1 | | | |
| **Fort Bragg** | **4** | **3** | | **2** | **vulnerable** |
| Friday Harbor | | | | 1 | |
| **Garibaldi** | **1** | **1** | **4** | **3** | **most vulnerable** |
| Gearhart/Seaside | | | | | |
| Gig Harbor | | 1 | | | |
| **Gold Beach** | **1** | **2** | **1** | **1** | **vulnerable** |
| Goleta | | 1 | | | |
| Grayland | | | | | |
| Grays Harbor | 1 | | | | |
| Half Moon Bay | | 1 | | | |
| Hammond | | 1 | | | |
| Harbor | 1 | 1 | | | |
| Hood River | | | | 2 | |
| Hoquim | | | | | |
| Huntington Beach | | 1 | | | |
| **Ilwaco** | **4** | **1** | | **3** | **most vulnerable** |
| **La Conner** | **1** | | | **2** | **vulnerable** |
| **La Push** | | **1** | **1** | **5** | **vulnerable** |
| Lake Forest | | 1 | | | |
| Lake Forest Park | | 1 | | | |
| Long Beach | | | | 2 | |
| Long View | | | | | |
| Los Osos | | 1 | | | |
| Los Angeles | | | | 2 | |
| Mckinleyville | | 1 | | | |
| Monterey | 3 | 1 | | | |
| **Morro Bay** | **3** | **3** | | **1** | **vulnerable** |
| **Moss Landing** | **3** | **2** | | **4** | **most vulnerable** |
| Nasselle | | | | | |
| **Neah Bay** | | **2** | **1** | **5** | **most vulnerable** |
| Nehalem Bay | | | | 2 | |
| Netarts Bay | | | | 5 | |
| **Newport** | **4** | **3** | **5** | **1** | **vulnerable** |
| Newport Beach | 1 | 1 | | | |
| North Bend | 1 | 1 | | | |
| **Oakland** | | **1** | | **2** | **vulnerable** |

| | | | | | |
|---|---|---|---|---|---|
| Ocean Park | | | | | |
| **Oceanside** | | **1** | | **1** | **vulnerable** |
| Olympia | | | | | |
| Oth Humboldt cnty ports | 1 | | | | |
| Oth Marin/Sonoma outer coast ports | 1 | | | | |
| Oth Mendocino cnty ports | | | | | |
| Oth Monterey/Sta Cruz cnty ports | | 1 | | | |
| Oth No Puget Snd ports | | | | | |
| Oth Orange/LA cnty ports | 2 | 1 | | | |
| Oth San Diego cnty ports | 1 | 1 | | | |
| Oth San Luis Obispo cnty ports | | | | | |
| Oth SFBay/San Mateo cnty ports | 1 | | | | |
| Oth So Puget Snd ports | | | | | |
| Oth Ventura/Sta Barbara cnty ports | | | | | |
| Other Col R ports | 2 | | | | |
| Other Washington Coastl Ports | | | | | |
| Other/unknown CA ports | | | | | |
| Other/unknown WA | | | | | |
| **Oxnard** | **3** | **1** | | **1** | **vulnerable** |
| **Pacific City** | | **2** | **1** | **2** | **vulnerable** |
| **Point Arena** | **1** | **1** | | **2** | **vulnerable** |
| Point Reyes | | | | | |
| **Port Angeles** | **1** | **2** | | **1** | **vulnerable** |
| Port Hueneme | 1 | | | | |
| **Port Orford** | **2** | **3** | | **2** | **vulnerable** |
| **Portland** | **1** | | | **1** | **vulnerable** |
| Princeton | 3 | 1 | | | |
| Pseudo port code for Columbia River | 2 | | | | |
| Pt Townsend | | | | 1 | |
| Raymond | | | | | |
| Reedsport | | 1 | | | |
| Richmond | | | | 2 | |
| Salem | | | | | |
| Salkum | | 1 | | | |
| San Diego | 2 | 1 | | | |
| San Francisco | 4 | 3 | | | |
| San Jose | | | | | |
| San Luis Obispo | | 1 | | | |
| **San Pedro** | **4** | **1** | | **1** | **vulnerable** |
| Santa Barbara | 4 | 1 | | | |
| **Santa Cruz** | **2** | **1** | | **2** | **vulnerable** |
| Santa Maria | | 1 | | | |
| Sausalito | | | | | |
| **Seaside** | | **1** | | **1** | **vulnerable** |
| Seattle | 3 | 1 | | | |
| Sequim | | | | | |
| Shelton | | | | 2 | |
| **Siletz** | | **1** | | **2** | **vulnerable** |
| South Beach | | 1 | | | |
| South Bend | | 1 | | | |
| Tacoma | | | | 2 | |
| Terminal Island | 3 | | | | |
| Tillamook | 2 | | | | |
| Tokeland | | | | | |
| Toledo | 1 | 1 | | | |
| Tomales Bay | | | | | |
| Trinidad | | | | 3 | |
| Ventura | 3 | | | | |
| Waldport | | | | 3 | |

| | | | | | |
|---|---|---|---|---|---|
| **Warrenton** | **1** | **1** | | **1** | **vulnerable** |
| **Westport** | **4** | **2** | **2** | **1** | **vulnerable** |
| Willapa Bay | 2 | | | | |
| Willmington | | 1 | | | |
| **Winchester Bay** | **2** | | **1** | **4** | **vulnerable** |
| Yachats | | | | 2 | |

**Table A.4-33. Commercial and recreational scores and identification of vulnerable counties**

| | Number of times the county scored in top one-third of commercial fishing engagement indicators | Number of times the county scored in top one-third of commercial groundfish dependency indicators | Number of times the county scored in top one-third (least resilient) of resiliency indicators | Vulnerable Area |
|---|---|---|---|---|
| **County** | | | | |
| Alameda County | 1 | | | |
| Benton County | | | | |
| Butte County | | 1 | | |
| Clackamas County | | 1 | | |
| **Clallam County** | | **1** | **2** | **vulnerable** |
| Clark County | | | | |
| **Clatsop County** | **3** | **2** | **2** | **vulnerable** |
| Columbia County | | | 2 | |
| Contra Costa County | | | | |
| **Coos County** | **4** | **2** | **3** | **most vulnerable** |
| Cowlitz County | | | 3 | |
| **Curry County** | **2** | **2** | **2** | **vulnerable** |
| **Del Norte County** | **2** | **1** | **4** | **vulnerable** |
| Deschutes County | | 1 | | |
| Douglas County | | | 1 | |
| El Dorado County | | | | |
| Fresno County | | | | |
| **Grays Harbor County** | **4** | **2** | **4** | **most vulnerable** |
| Hood River County | | | 4 | |
| **Humboldt County** | **3** | **1** | **3** | **most vulnerable** |
| Island County | | | 2 | |
| Jackson County | | | | |
| Jefferson | | | 2 | |
| Josephine County | | | | |
| Kern County | | | | |
| King County | 1 | 1 | | |
| Kitsap County | | | 1 | |
| Klamath County | | | | |
| Lake County | | | | |
| Lane County | | | 1 | |
| Lewis County | | | | |
| **Lincoln County** | **4** | **2** | **4** | **most vulnerable** |
| **Los Angeles County** | **3** | **3** | **2** | **vulnerable** |
| Marin County | 2 | | | |
| Marion County | | | | |
| Mason County | | | 2 | |
| **Mendocino County** | **3** | **1** | **3** | **most vulnerable** |
| **Monterey County** | **2** | **1** | **2** | **vulnerable** |
| Multnomah County | | | | |
| Nevada County | | | | |
| Okanogan County | | | | |
| Orange County | 3 | 1 | | |
| **Pacific County** | **3** | **1** | **3** | **most vulnerable** |
| Pierce County | | | | |
| Placer County | | | | |
| Polk County | | | | |
| Riverside County | | | | |
| Sacramento County | | | | |
| San Benito County | | | | |
| San Bernardino County | | | | |
| San Diego County | 3 | 1 | | |

| | | | | |
|---|---|---|---|---|
| San Francisco Bay County | 2 | | | |
| San Joaquin County | | | 2 | |
| **San Juan County** | | **1** | **1** | **vulnerable** |
| **San Luis Obispo County** | **2** | **1** | **2** | **vulnerable** |
| San Mateo County | 3 | 1 | | |
| **Santa Barbara County** | **2** | **1** | **1** | **vulnerable** |
| Santa Clara County | 1 | | | |
| Santa Cruz County | 2 | | | |
| Shasta County | | | | |
| Skagit County | | | 1 | |
| Skamania County | | | 3 | |
| Snohomish County | | | 1 | |
| Solano County | | | 1 | |
| Sonoma County | 2 | 1 | | |
| Stanislaus County | | | | |
| Tehama County | | | | |
| Thurston | | | 1 | |
| **Tillamook County** | **2** | **1** | **2** | **vulnerable** |
| Tulare County | | | | |
| Tuolumne County | | | | |
| Umatilla County | | 1 | | |
| Ventura County | 2 | 2 | | |
| **Wahkiakum County** | **1** | **1** | **3** | **vulnerable** |
| Washington County | | | | |
| **Whatcom County** | **3** | **1** | **2** | **vulnerable** |
| Yamhill County | | | | |
| Yolo County | | | | |
| Yuba County | | | | |

With regard to dependency on the commercial groundfish fishery, thirty-two cities are identified as vulnerable areas. Neah Bay is identified as a most vulnerable area. Other vulnerable areas include Astoria, Bellingham, Coos Bay, Crescent City, Eureka, Fort Bragg, Moss Landing, Pacific City, and Port Orford. All have high groundfish dependency scores (two or greater) and low resiliency scores (two or greater). Morro Bay, Newport, and Oceanside all have high groundfish dependency (score of three) but lower resiliency scores (score of one). Chinook, Garibaldi, La Push, and Ilwaco all have higher groundfish dependence (score of one) and the lowest resiliency scores (three or more). Several vulnerable areas that are cities are identified as highly engaged and highly dependent (see Table A.4-22).

Astoria, Garibaldi, Gold Beach, and Westport rank in all city categories: commercial and recreational engagement and dependency as well as low resiliency.

Sixteen counties are identified as vulnerable areas with regards to commercial fishing engagement. Six counties are labeled as most vulnerable areas and include Coos, Grays Harbor, Humboldt, Lincoln, Mendocino, and Pacific counties. All have high commercial fishing engagement scores (three or more) and low resiliency scores (three or more). Grays Harbor and Lincoln counties score highest in fishing engagement (scores of four) and lowest in resiliency (scores of four).

Seventeen counties are identified as vulnerable areas with regard to groundfish dependence. Clatsop, Coos, Curry, Grays Harbor, Lincoln, and Los Angeles counties score as most highly dependent (scores of two or more) and least resilient (scores of two or more). Several vulnerable areas that are counties are identified as highly engaged and highly dependent (see Table A.4-23).

### A.4.6.2 Recreational fishery

Ten cities are identified as vulnerable areas with regard to recreational fishing in Oregon and Washington. These cities are bolded in Table A.4-22 under the recreational column. Astoria, Depoe Bay, and Garibaldi are all highly engaged in the recreational fishery (score of two or more) and least resilient (score of two or more). Garibaldi is the only city labeled as "most vulnerable" due to its high scores in both engagement/dependence on recreational fisheries and low resiliency.

Other recreational vulnerable cities include Gold Beach, La Push, Neah Bay, Newport, Pacific City, Westport, and Winchester. Newport has very high score in recreational engagement (score of five) but a lower resiliency score (score of one). La Push, Neah Bay and Winchester all have lower recreational engagement scores (scores of one) but very low resiliency scores (score of four or more).

It was not possible to identify recreationally engaged vulnerable areas in California due to the two-county and regional level recreational data that was available with regard to recreational fishing, compared to city and county level data available for the resiliency indicators. However, we were able to identify some California communities as potential vulnerable areas based on commercial engagement in and dependency on the groundfish fishery. Table A.4-16 shows that San Luis Obispo through Santa Cruz counties and San Diego through Los Angeles counties are most engaged in recreational fishing and dependent on the groundfish recreational fishery. Los Angeles, San Luis Obispo and Santa Barbara counties are all ranked as least resilient in Table A.4-23.

### A.4.6.3 Summary

In summary, thirty-eight cities and eighteen counties are identified as commercial and/or recreational vulnerable areas (areas with high engagement or dependence on commercial or recreational fisheries and low resilience to change). Tables A.4-22 and A.4-23 display the results of the analysis. To qualify as a vulnerable area, a city or county must be listed in the top one-third of ranked indicator values for at least one engagement or dependency indicator and one resiliency indicator. When stricter ranking requirements are applied so that a community has to be ranked in the top one-third of an indicator twice under engagement and/or dependence and resilience, a smaller pool of cities and counties qualify. These seventeen cities include Astoria, Bellingham, Bodega Bay, Coos Bay, Crescent City, Depoe Bay, Eureka, Fort Bragg, Garibaldi, Ilwaco, Moss Landing, Neah Bay, Newport, Pacific City, Port Orford, Santa Cruz, and Winchester Bay. The fifteen counties include: Clatsop, Coos, Curry, Del Norte, Grays Harbor, Humboldt, Lincoln, Los Angeles, Mendocino, Monterey, Pacific, San Luis Obispo, Tillamook, Wahkiakum, and Whatcom counties. If even stricter ranking requirements are applied so that a community must be ranked in the top one-third of an indicator three times under engagement and/or dependence and resilience, four cities and six counties are identified as vulnerable. These cities and counties are labeled “most vulnerable”. The cities include: Garibaldi, Ilwaco, Moss Landing, and Neah Bay. The counties include: Coos, Grays Harbor, Humboldt, Lincoln, Mendocino, and Pacific counties.