

Management Context

The Pacific Region includes California, Oregon, and Washington. Federal fisheries in this region are managed by the Pacific Fishery Management Council (PFMC) and NOAA Fisheries (NMFS) under four fishery management plans (FMPs).

Pacific Region Fishery Management Plans

1. Pacific coast groundfish
2. Pacific coast salmon
3. Coastal pelagic species
4. West coast highly migratory species

Of the stocks or stock complexes covered in these fishery management plans, seven are currently listed as overfished: canary rockfish, Chinook salmon (one stock), coho salmon (two stocks), cowcod, petrale sole, and yelloweye rockfish. One stock complex is currently subject to overfishing: yellowfin tuna. Interesting management techniques are employed in the Pacific Region's fisheries. The Pacific groundfish and salmon fisheries are subject to 'weak stock management' where access to the harvestable surplus of healthier stocks is often restricted to protect weaker stocks with which they co-mingle in the ocean. These weaker stocks include eight rebuilding groundfish stocks and salmon listed under the Endangered Species Act as well as other non-listed stocks that also constrain the fishery.

Salmon management is further complicated by the need to ensure equitable allocation of harvest among diverse user groups and to coordinate with other entities that have jurisdiction over other aspects of salmon management. Decades of habitat modification, hatchery practices, harvest, and growing competition for water have affected the viability of salmon stocks and made them more vulnerable to adverse environmental conditions including the prolonged drought and adverse ocean conditions experienced in recent years. Low returns of salmon to the Klamath River in 2006 and to the Sacramento River in 2008 and 2009 resulted in unprecedented closures of ocean and in-river fisheries and federal disaster relief to affected entities.

Coastal pelagic species (CPS) are highly variable, environmentally sensitive stocks that provide forage for marine mammals, birds, and fish. These species include Pacific sardine, northern anchovy, Pacific and jack mackerel, and market squid. Of these, Pacific sardine is the most commonly targeted CPS finfish and is managed via an innovative harvest control rule whereby allowable harvest varies with sea surface temperature. Because the geographic range of sardine tends to expand with abundance, harvest allocation between California and Pacific Northwest fisheries is an ongoing and dynamic issue.

The annual sardine harvest guideline is allocated coast-wide on a seasonal basis. Recent decreases in harvest guideline limits has contributed to the development of an intense derby fishery.

The Fishery Management Plan for Highly Migratory Species (HMS) includes tunas, billfish and pelagic sharks as managed

species. The albacore surface hook-and-line fishery is by far the most economically important commercial HMS fishery, followed by the drift gillnet fishery for swordfish and thresher shark. HMS are also a very important component of the catch for West Coast recreational commercial passenger fishing vessel fleet, and the private recreational boat fishery.

Management of West Coast HMS fisheries poses unique challenges because nearly all of the managed HMS species range far beyond the 200 nautical mile limit of the West Coast Exclusive Economic Zone; the same HMS stocks which are targeted by West Coast fisheries are shared with Hawaii-based U.S. fisheries, as well as the fleets of other Pacific Rim nations. As such, the management of the HMS fisheries is coordinated by the Pacific Fishery Management Council through cooperation with Regional Fishery Management Organizations with overarching management jurisdiction over North Pacific stocks, including the Inter-American Tropical Tuna Commission, for the Eastern Pacific Ocean, and the Western and Central Pacific Fishery Commission, for the Western Pacific.

Catch limits for Pacific halibut, a transboundary fish stock, are set in January by the International Pacific Halibut Commission (IPHC). This bilateral commission between the U.S. and Canada determines total allowable catch levels (TACs) for Pacific halibut that will be caught in the U.S. and Canadian Exclusive Economic Zones (EEZs)¹. Once catch levels are determined, the PFMC develops a catch-sharing plan for tribal and non-tribal (commercial and recreational) fisheries conducted in the federal waters of California, Oregon, and Washington.

The whiting industry voluntarily instituted the Pacific Whiting Conservation Cooperative in 1997. In 2001, the PFMC implemented the Pacific sablefish permit stacking program, whereby vessels are allowed to stack multiple vessel permits on a single vessel in order to obtain additional trip limits for that vessel. The trawl rationalization program involving individual fishing quotas (IFQs) for non-whiting groundfish and whiting trawlers, and coops for whiting mothership and catcher processor sectors was implemented in January 2011. The shore-based commercial groundfish fishery had an ex-vessel value of \$66.1 million in 2009.

Ecolabels are another market-based management tool that is intended to encourage fishermen to adopt harvest practices that are considered sustainable by an organization such as the Marine Stewardship Council (MSC). The Oregon pink shrimp fishery, Pacific hake midwater trawl, the American Albacore Fishing Association albacore tuna fishery and the Oregon dungeness crab fishery have received certifications from the MSC.

Commercial Fisheries

In 2009, commercial fishermen in the Pacific Region landed roughly 894 million pounds of finfish and shellfish, earning \$488 million in landings revenue. Landings revenue was dominated by other shellfish (\$129 million) and crab (\$124 million). These species groups commanded ex-vessel prices of \$4.56 and \$2.09

¹Waters off the coasts of California, Oregon, Washington, and Alaska comprise the U.S. EEZ subject to management by the IPHC

per pound, respectively, and comprised 52% of total landings revenue, but only 9.8% of total landings in the Pacific Region.

Key Pacific Region Commercial Species

- Albacore tuna
- Crab
- Flatfish
- Hake
- Other shellfish
- Rockfish
- Sablefish
- Salmon
- Shrimp
- Squid

Washington had the highest landings revenue in the region with \$228 million in 2009, followed by California (\$150 million) and Oregon (\$102 million). In terms of pounds landed, California contributed the most (372 million pounds), followed by Oregon (198 million pounds) and Washington (164 million pounds).

Economic Impacts¹

In 2009, the Pacific Region's seafood industry generated \$20 billion in sales impacts in California, \$1.1 billion in sales impacts in Oregon, and \$7.3 billion in sales impacts in Washington. California also generated the largest income, value added, and employment impacts (\$4.3 billion; \$7.1 billion; 121,000 jobs). The smallest income impacts were generated in Oregon (\$341 million) and the smallest employment impacts were also generated in Oregon (14,000 jobs).

The sector that generated the greatest employment impacts in California was the seafood importers sector (55,000 jobs) followed by the retail sector with 47,000 jobs. In Washington, the retail, seafood processors and dealers, and importers sectors generated the greatest employment impacts, ranging between 15,000 and 19,000 jobs. The retail sector in Oregon generated nearly two times the employment impacts (6,700 jobs) as the commercial harvester sector, which generated the next highest employment impacts in the state (3,500 jobs).

The importers sector contributed more to the total value added impacts than any other single sector in California and Washington. In California, the importers sector generated \$4.6 billion, followed by the retail sector with \$1.4 billion in value added impacts. The commercial harvester sector generated a larger portion (22%) of total state value added impacts in Oregon, than in any other state in the Pacific Region. In Washington, other than the importers sector, the seafood processors and dealers sector contributed the most to value added impacts (26%).

Landings Revenue

Landings revenue in the Pacific Region totaled \$488 million in 2009. This was a 29% increase (a 10% increase in real terms) from 2000 levels (\$380 million) and a 2.5% decrease (a 2.1% decrease in real terms) relative to 2008 (\$500 million). Totaling \$320 million in 2009, shellfish revenue experienced a 58% increase (a 36% increase in real terms) from 2000 to 2009 and experienced a 12% increase (13% increase in real terms) from 2008 to 2009.

In terms of finfish, Washington contributed the most (\$61 million) followed by Oregon (\$53 million), and California (\$46 million). Shellfish landings revenue was also dominated by Washington, which contributed the most (\$167 million) followed by California (\$104 million), and Oregon (\$50 million).

Other shellfish and crab had the highest landings revenue in the Pacific Region in 2009, with \$129 million and \$124 million, respectively. Together they accounted for 52% of the total landings revenue generated in 2009. Between 2000 and 2009, the landings revenue for other shellfish increased 55% and increased 60% for crab.

From 2000 to 2009, species or species groups with large changes in landings revenue include squid (increased 107%), sablefish (increased 63%), and albacore tuna (increased 61%). Species or species groups with large changes in landings revenue between 2008 and 2009 include squid (increasing 113%), hake (decreasing 76%), and shrimp (decreasing 34%).

Between 2008 and 2009, hake experienced a 76% decrease in landings revenue from \$58.5 million to \$14 million. A major driver in this decrease was the 52% reduction in landings resulting from a forecast of lower stocks and rockfish bycatch restrictions. Other drivers of this decrease in revenue include international economic conditions and the conditions in fisheries which produce product closely related to hake such as walleye pollock.

Landings

Fishermen in the Pacific Region landed 894 million pounds of finfish and shellfish in 2009. This was a 32% decrease from the 1.3 billion pounds landed in 2000 and a 18% decrease from the 1.1 billion landed in 2008. Finfish landings contributed 65% of total landings in the Pacific Region (581 million pounds) in 2009. From 2008 to 2009, finfish landings experienced a 36% decrease. Over the same time period, shellfish landings experienced a 69% increase from 185 million pounds in 2008 to 313 million in 2009 and a 16% decrease from 371 million pounds in 2000.

Hake and squid had the highest annual landings in the Pacific Region in 2009, with 253 million pounds and 204 million pounds, respectively. Although they together accounted for 51% of the total landings in the Pacific Region, they only accounted for 14% of the total landings revenue generated in 2009. Between 2000 and 2009, the greatest changes in landings were experienced by salmon (increasing 63%), crab (increasing 61%), and rockfish (decreasing 59%). In the short term, between 2008 and 2009 the largest changes were experienced by squid (increasing 139%), salmon (increasing 77%), and hake (decreasing 52%).

Prices

The ex-vessel prices for the Pacific Region's key species and species groups in 2009 were higher than their 10 year average for five of the key species (four of the species in real terms). Ex-vessel prices for squid and other shellfish experienced the biggest increases between 2000 and 2009, increasing 180% (140% in real terms) and 70% (45% in real terms), respectively. Relative

¹The NMFS Commercial Fishing Industry Input/Output Model was used to generate the impact estimates (see NMFS Commercial Fishing & Seafood Industry Input/Output Model, available at: www.st.nmfs.noaa.gov/documents/commercial_seafood_impacts_2007-2009.pdf)

to the ex-vessel prices in 2008, the Pacific Region's sablefish experienced the greatest increase (3.81%, 4.17% in real terms) from \$2.10 in 2008 to \$2.18 in 2009; salmon experienced the greatest decrease (48%, 48% in real terms) from \$1.42 to \$0.74.

Commercial Fisheries Facts

Landings revenue

- On average, between 2000 and 2009, the key species or species groups accounted for 91% of total revenue, generating \$390 million in the Pacific Region.
- Crab had higher landings revenues than any other species or species group, averaging \$106 million in landings revenue from 2000 to 2009.
- Shrimp had the largest annual increase in landings revenue over the 10 year time period, increasing 245% from \$24 million in 2001 to \$83 million in 2002.
- Hake had the largest annual decrease in landings revenue over the 10 year time period, decreasing 76% from \$58 million in 2008 to \$14 million in 2009. The magnitude of the decrease in hake landings revenue was driven by the high revenue in 2008, which was almost 2 times higher than the next highest landings revenue (\$34 million in 2006).

Landings

- Key species or species groups contributed an average of 72% annually to total landings between 2000 and 2009.
- Hake (whiting), contributed the most to landings in the region, averaging 427 million pounds from 2000 to 2009.
- Squid had the largest annual increase in landings over the 10 year time period, increasing 139% from 85 million in 2008 pounds to 204 million pounds in 2009.
- Shrimp had the largest annual decrease in landings over the 10 year time period, decreasing 52% from 82 million pounds in 2002 to 39 million pounds in 2003.

Prices

- Other shellfish had the highest average annual ex-vessel price per pound (\$3.52) over the time period, followed by crab (\$1.92), and sablefish (\$1.64).
- Hake (whiting) had the lowest average annual ex-vessel price per pound (\$0.06) over the time period, followed by squid (\$0.21), and flatfish (\$0.42).
- Shrimp had the largest annual increase in ex-vessel price over the 10 year time period, increasing 152% from \$0.40 per pound in 2001 to \$1.01 in 2002.
- Salmon had the largest annual decrease in ex-vessel price over the 10 year time period, decreasing 48% from \$1.42 per pound in 2008 to \$0.74 in 2009.

In California, the species or species group with the largest change in ex-vessel price from 2000 to 2009 was squid (180% increase, 140% increase in real terms) from \$0.10 to \$0.28. The largest change in ex-vessel price experienced in Oregon was for Pacific sardine (140% increase, 105% increase in real terms from \$0.05 to \$0.12 and in Washington the largest change in ex-vessel price

was experienced by hake (50% increase, 28% increase in real terms from \$0.04 to \$0.06).

Recreational Fishing

In 2009, almost 1.8 million recreational anglers took 6.3 million fishing trips in the Pacific Region. Over 64% of these anglers were residents of a regional coastal county. Of the total saltwater fishing trips taken, 23% of them were taken from a private or rental boat and another 69% were shore-based. Rockfishes and scorpionfishes were the most frequently caught species or species group with 2.7 million fish caught in 2009, which represented 24% of total fish caught in the region. Of the rockfishes and scorpionfishes caught, 26% of them were released rather than harvested.

Economic Impacts and Expenditures¹

The contribution of recreational fishing activities in the Pacific Region are reported in terms of economic impacts at the state level (employment, sales, income, and value added impacts) and expenditures on fishing trips and durable equipment at the regional level. Employment impacts in California were the highest in the region with almost 14,000 full- and part-time employment impacts generated by recreational fishing activities in the state. Washington (3,300 jobs), and Oregon (1,600 jobs) followed in terms of employment impacts generated by recreational fishing activities.

In addition to employment impacts, the contribution of recreational fishing activities to Pacific Region's economy can be measured in terms of sales impacts and the contribution of these activities to gross domestic product (value added impacts). In 2009, sales impacts were also the highest in California (\$2 billion in sales impacts), followed by Washington (\$347 million), and Oregon (\$168 million). In California, shore-based fishing trips had the highest employment impacts relative to the other fishing modes; in Oregon and Washington, private boat fishing trips contributed the most to employment impacts.

Overall, these employment impacts were generated by expenditures on recreational fishing trips taken by anglers (private or rental boat, for-hire boat, or shore-based trips) or expenditures on durable equipment. Throughout the Pacific Region, most of the employment impacts in 2009 were generated by expenditures on durable equipment: 72% in Washington, 68% in California, and 38% in Oregon. In the same year value added impacts were the highest in California (\$1.1 billion in value added impacts), followed by Washington (\$186 million), and Oregon (\$93 million).

The total saltwater fishing trip and durable equipment expenditures were \$2.2 billion across the Pacific Region in 2009. Approximately 77% of these expenditures were related to durable equipment purchases. The greatest expenditures were for fishing tackle (\$674 million), followed by boat expenses (\$386 million), and other equipment (\$282 million). Fishing trip related expenditures by Pacific Region's non-residents totaled over \$22 million of which the greatest portion can be attributed

¹Expenditures and economic impacts from recreational fishing activities were generated using the NMFS Recreational Economic Impact Model (see Marine Angler Expenditures in the United States, 2006, available at: http://www.st.nmfs.noaa.gov/st5/publication/AnglerExpenditureReport/AnglerExpendituresReport_ALL.pdf)

to for-hire-based fishing trips (\$16 million). Residents of the Pacific Region spent \$476 million on trip-related expenses with the majority of these expenses related to shore trips (\$229 million).

Key Pacific Region Recreational Species

- Albacore and other tunas
- Barracuda, bass and bonito
- Croakers
- Flatfishes
- Greenlings
- Mackerel
- Rockfishes and scorpionfishes
- Salmon
- Sculpins
- Surfperches

Participation

There were 1.8 million recreational anglers who fished in the Pacific Region in 2009. This was a 9.3% increase from 2000 (1.6 million anglers). These anglers were Pacific Region residents from either a coastal (1.1 million anglers) or non-coastal county (638,000 anglers). Over 64% of total anglers in 2009 were residents of a coastal county. Coastal county angler participation in 2009 experienced a 7.8% decrease relative to 2000 (1.2 million anglers) and experienced a 6.7% increase between 2008 and 2009. Non-coastal county angler participation experienced a 63% increase relative to 2000 (391,000 anglers) and experienced a 66% increase relative to 2008 (385,000 anglers).

Fishing Trips

Recreational fishermen took 6.3 million fishing trips in the Pacific Region in 2009. This was a 13% decrease from 2000 (7.3 million trips) and was 527,000 more trips than were taken in 2008. Of the total trips taken in the Pacific Region in 2009, approximately 69% of the trips were shore based (4.3 million trips). The other most popular mode of fishing was private or rental boat based with 1.5 million trips in 2009.

Harvest and Release

In terms of the Pacific Region's key species and species groups, rockfishes and scorpionfishes (2.7 million fish), mackerel (2 million fish), barracuda, bass and bonito (1.6 million fish) and surfperches (1.5 million fish) were the most often caught by anglers in 2009. Sculpins (75.2% released), barracuda, bass and bonito (74.6% released), mackerel (62.7% released), and greenlings (50% released) were the species that were most often released rather than harvested. Anglers harvested more often than released albacore and other tunas (86% harvested), salmon (79.6% harvested) and rockfishes and scorpionfishes (74.3% harvested). Most of the rockfishes and scorpionfishes in the Pacific region were caught in California while most of the salmon and other tunas were caught in Washington and Oregon. Between 2000 and 2009, seven of the Pacific Region's key species or species groups showed decreases in catch totals. Key species or groups with the largest decreases were barracuda, bass and bonito (76%), flatfishes (70%), and albacore and other tunas (56%).

Recreational Fishing Facts

Participation

- An average of 1.7 million anglers fished in Pacific Region annually from 2000 to 2009.
- In 2009, coastal county residents made up 64% of total anglers in this region. These anglers averaged 73% of total anglers annually over the 10 year time period.
- The largest annual increase in the number of coastal anglers during the 10 year time period occurred between 2005 and 2006, increasing 22%, from 1 million anglers to 1.3 million anglers.
- The largest annual decrease during the same period for coastal anglers occurred between 2003 and 2004, decreasing 19%, from 1.4 million anglers to 1.2 million anglers.

Fishing trips

- In the Pacific Region, an average of 7.1 million fishing trips were taken annually from 2000 to 2009.
- Private or rental boat and shore-based fishing trips accounted for 1.5 million and 4.3 million fishing trips, respectively, in 2009. Together these made up 92% of the fishing trips taken in that year.
- The largest annual increase in the number of total trips taken annually over the 10 year time period occurred between 2000 and 2001, increasing 21%, from 7.3 million trips to 8.8 million trips.
- The largest annual decrease during the same period in total trips taken occurred between 2003 and 2004, decreasing 20%, from 8.3 million trips to 6.7 million trips.

Harvest and release

- Barracuda, bass and bonito was the most commonly caught key species or species group, averaging 3.9 million fish over the 10 year time period. Of these, 66% were released rather than harvested.
- Of the ten commonly caught key species or species groups, seven were released more often than harvested over this time period. The species or species group that was most commonly released was sculpins (77% released).
- Albacore and other tunas (83% harvested), followed by rockfishes and scorpionfishes (77% harvested), and salmon (74% harvested) were key species or groups that experienced the greatest proportion of harvests rather than releases.
- The largest annual change in the number of fish released was for releases of albacore and other tunas, which increased 1283% between 2002 and 2003; the largest annual change in number of fish harvested occurred in salmon, which increased 599% from 2008 to 2009.

Marine Economy

The sum of the gross domestic products by state for California, Oregon, and Washington was \$2.4 trillion in 2008. Employee compensation totaled \$1.3 trillion and annual payroll totaled \$832 billion. These economic measures experienced increases of 46%, 36%, and 29% respectively, between 2000 and 2008, and experienced a 2.2% increase, a 1.4% increase, and a 1.2% increase, respectively between 2007 and 2008. Approximately 1.2

million establishments employed 18 million full- and part-time employees across the region in 2008. This was a 10% increase in establishment numbers and a 7.6% increase in employee numbers from 2000 to 2008. In 2008, California had the highest establishment and employee numbers, annual payroll, employee compensation, and gross state product levels in the Pacific Region. California's approximately 879,000 establishments employed approximately 14 million employees in 2008. Gross state product in California was \$1.9 trillion, followed by Washington (\$336 billion) and Oregon (\$169 billion).

In 2008, the commercial fishing location quotient (CFLQ) for Washington was the highest in the region at 13.54. This was an 8.7% increase from 2001 and a 2.3% increase from 2007. Washington's CFLQ suggests that the level of employment in commercial fishing-related industries in this state is approximately 14 times higher than the level of employment in these industries nationwide. The CFLQ 2008 in Oregon was 3.27 (a 3.3% decrease from 2000 and a 12% increase from 2007), while the CFLQ in 2007 in California was 0.74 (a 26% decrease from 2000; and a 4.2% increase from 2007).

Seafood Sales and Processing

In 2008, there were 202 nonemployer firms engaged in seafood product preparation and packaging across the Pacific Region. This was a 73% increase from 2000 levels, and a 138% increase in the number of firms in Oregon over this time period. In 2007, 69% of these firms were located in California. Region-wide, annual receipts totaled \$18 million in 2008 and increased 18% from 2000 to 2008. Annual receipt totals experienced a 69% increase in Washington over the same time period.

In contrast to the increase in nonemployer firms region-wide, the number of employer establishments engaged in seafood product preparation and packaging decreased 27% from 224 in 2000 to 164 in 2008. Approximately 59% of these establishments were located in Washington. The numbers of employees in these industries also decreased across the region, decreasing 21% to approximately 8,800 full- and part-time workers in 2008, despite an annual payroll increase of 26% to \$399 million.

There were 403 seafood wholesale establishments in 2008. The number of employees was not available at the region level. From 2000 to 2008, the number of seafood wholesale establishments decreased 28% across the Pacific Region.

Nonemployer firms engaged in seafood retail in the Pacific Region totaled 259 in 2008, a 23% increase relative to 2000. Of

these firms, 81% were located in California. At the state level, these firms increased 18% in Washington and increased 27% in California between 2000 and 2008. Oregon did not experience a change in number of retail seafood firms. Annual receipts from the nonemployer retail sector in the region totaled \$24 million in 2008 a 8% increase from 2000 (a 7.9% decrease in real terms) and a 6.4% increase from 2007 (a 3.9% decrease in real terms).

Employer establishments engaged in seafood retail increased 3.7% from 2000 to 2008, totaling 226 in 2008. These establishments employed 1,357 workers. Over 71% of these establishments were located in California. Region-wide, the numbers of employees in the seafood retail sector increased 21% between 2000 and 2008. All states in the region experienced increases, with the largest increase seen in Oregon (58% increase). Annual payroll also increased across the Pacific Region, a 61% increase region-wide (37% increase in real terms), to \$32 million in 2008.

Transport, Support, and Marine Operations

For sectors in which there were data available for all states in the region, the ship and boat building employed more people than any other industry in the transport, support, and marine operations sector, employing approximately 21,000 people in 2008. This industry also had the highest annual payroll in the region totaling \$954 million. Marinas had the highest number of establishments (430), followed by the ship and boat building industries with 346 establishments and the navigational services to shipping industries with 136 establishments. Of all of the industries, port and harbor operations had the fewest number of establishments (29).

In California, industries with large changes in establishment numbers, employees, or annual payroll from 2007 to 2008 were: deep sea passenger transportation (62% decrease in establishments), port and harbor operations (42% decrease in employees), ship and boat building (26% increase in employees) and port and harbor operations (22% decrease in payroll). In Oregon, large changes were seen for ship and boat building (56% increase in payroll), port and harbor operations (50% decrease in establishments), marine cargo handling (44% increase in establishments) and marinas (42% decrease in employees). In Washington, large changes were seen in the port and harbor operations (83% increase in establishments), navigational services to shipping (38% increase in payroll), port and harbor operations (37% increase in payroll) and coastal and Great Lakes freight transportation (35% decrease in establishments).