

Positive signs in 2003 and 2004

Since the late 1980s, much of the news about Alaska's fisheries has been negative. Gross earnings fell 63 percent from 1988 to 2002¹ and the number of active permit holders fell 35 percent over the same period. The good news is that fisheries data from 2003 and 2004 – including the employment estimates that are the subject of this article – suggest that the tide may have changed.

Among the reasons for cautious optimism are a 19 percent increase in gross earnings from 2002 to 2004² and a 3 percent increase in

active permit holders. Employment in the fisheries also recovered some of the lost ground, adding 265 jobs after losing nearly 1,500 over the previous two years. (See Exhibit 1.)

Employment data – the new kid on the block

Most of what we know about the state's fisheries comes from the Alaska Commercial Fisheries Entry Commission, which provides detailed fisheries data on, among other things, gross estimated earnings, pounds caught, permit holders and permit holders who fished. CFEC's data is generally available back to at least 1980.

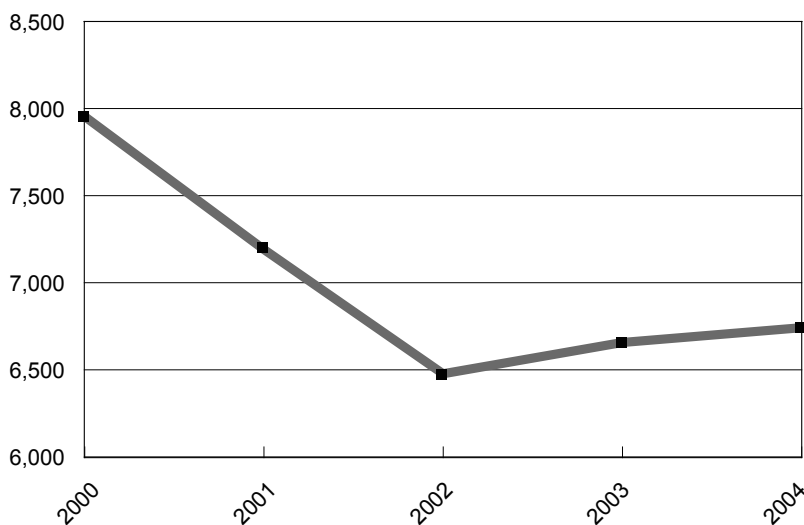
The employment estimates discussed in this article are produced by the Alaska Department of Labor & Workforce Development and are a relatively recent addition to the library of fisheries-related information. The series only goes back to 2000 and this is just the second time it has been published in Alaska Economic Trends. Before looking further at the numbers themselves, though, it will be useful to clarify a few key terms and concepts and to specify what information the employment data provide that is not already available from other sources.

Comparisons with permit and crew license data

As noted above, CFEC provides statistics on the number of commercial fishing permits issued. These are comparable to statistics on the number of business licenses issued, in that both give their owners a right to participate in a certain regulated activity.

1 Fish Harvesting Employment Alaska, 2000-2004

Employment

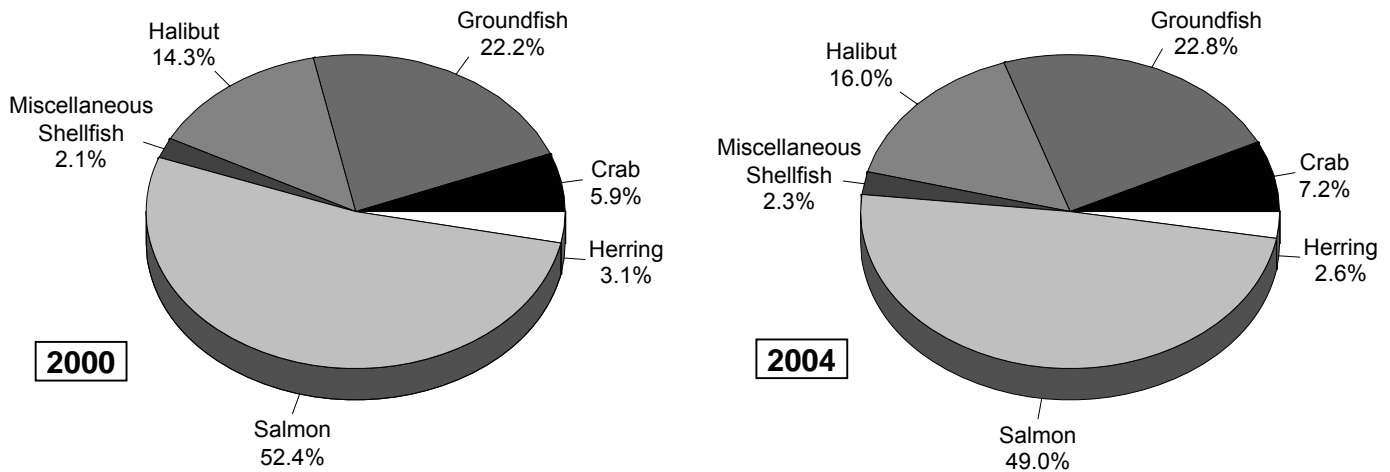


Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

¹ Earnings are adjusted to constant 2004 dollars using the Anchorage Consumer Price Index.

² The year 2004 is the most recent year for which data are currently available.

Harvesting Employment by Species Alaska, 2000 and 2004 **2**



Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

As a subset of the total number of permit holders, CFEC also collects data on the number of permit holders who actually catch and sell fish with their permits. These are the statistics referred to in the first paragraph as “active permit holders” or in some CFEC publications as “fishermen who fished.”

What neither the number of permit holders nor the number of active permit holders can tell us, however, is the number of jobs generated by the permits.³ Some permit holders may fish during only one month a year, while others may fish during 10. Both will show up in CFEC data as one active permit holder during that year despite the obvious difference in the amount of employment generated by the two permits.

What’s more, a count of permit holders leaves out another important piece of information: how many jobs, if any, are created for crew members hired to help with the harvest. In most cases, the permit holder doesn’t work alone. In this sense, the permit holder is akin to the business owner whose license to operate creates a certain number of jobs for others.

Just as an active business license for a full-service restaurant that operates year-round generates more jobs than a business license for a seasonal hot dog stand, active permit holders also generate different numbers of jobs depending on how labor-intensive it is to participate in the given fishery and also on how many months of the year the permit holders are actively fishing their permits.

On the low end of the spectrum, a permit to harvest clams with a shovel doesn’t generate a lot of jobs because the harvest can be done by just one person and it’s only done for a few months of the year. By contrast, a permit to harvest king crab on a vessel over 60 feet long generates substantially more jobs because it takes an average of six people to operate the boat and gear. Permits for Alaska’s less seasonal fisheries – groundfish and halibut, for example – also generate more jobs per permit than do permits in fisheries that only last for a few months each year.

The number of crew licenses issued each year is collected and published by the Alaska

³ Employment data published in this article and elsewhere in *Trends* and U.S. Bureau of Labor Statistics’ publications are annualized so that a job that lasts all 12 months of the year is counted as one job, a job that lasts six months is counted as 0.5, and so forth.

3 Statewide Salmon Prices In nominal dollars, 2001-2004

	King	Sockeye	Coho	Pink	Chum
2000	\$1.95	\$0.79	\$0.56	\$0.15	\$0.27
2001	\$1.68	\$0.57	\$0.49	\$0.13	\$0.34
2002	\$1.30	\$0.60	\$0.36	\$0.10	\$0.18
2003	\$1.43	\$0.63	\$0.48	\$0.09	\$0.18
2004	\$1.85	\$0.60	\$0.68	\$0.10	\$0.21

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

Department of Fish and Game. This too is different from a count of jobs in that the crew license data simply quantifies the number of people who are eligible to work in the fisheries as crew members in a given year.

To illustrate the difference, if 12 different crew members work for a month each in a year, the crew member count would be 12 but the annualized job count would be one. On the other hand, if one crew member works for all 12 months, both the crew member count and the annualized job count would be one. Under most circumstances, increases in crew licenses will correlate with increases in the total number of jobs, but it's possible for the two to diverge since they count different things.

Familiar turbulence for the fishing industry

As is often the case with resource-based industries, employment levels in Alaska's fish harvesting industry have seen significant variation over the years, and the 2000 to 2004 period discussed in this article is no exception. Changes to both supply and demand are common, and regulatory changes, such as the introduction of the limited entry permit system and individual fishing quotas, can also have a dramatic effect on employment levels.

Biologically, Alaska's fisheries are healthy; economically, they have struggled since the late

1980s. Salmon fishermen in particular have faced lower prices as a result of competition from farmed salmon and the consequent increase in world supply. In 1980 the world salmon supply was around 550,000 tons, 98 percent of which was wild salmon; by 2001 the world supply had grown four-fold to roughly 2.2 million tons and 62 percent of that amount came from fish farms.⁴

Higher prices raise employment levels in the salmon fishery

In terms of employment, the salmon fishery is the state's dominant contributor. (See Exhibit 2.) In 2004, 49 percent of all fish harvesting jobs came from salmon, down slightly from 52.4 percent in 2000. The 3,305 jobs generated by salmon fishing in 2004 were still more than double the amount from groundfish, the next largest category.

Statewide per-pound prices for king and coho salmon showed definite improvement in 2003 and 2004. King salmon prices rose from \$1.30 a pound in 2002 to \$1.85 in 2004 and coho prices increased from \$.36 a pound to \$.68 over the same period. (See Exhibit 3.) Sockeye and pink prices were essentially flat, however, and chum prices moved only slightly from \$.18 a pound to \$.21. In fact, prices for sockeye, pink and chum – the three species that account for over 93 percent of all salmon harvested, by volume – are still at or near historical lows. The impact of rising prices for king and coho was nevertheless sufficient to have a noticeable effect on total earnings. After falling from \$412 million in 2000 to \$144 million in 2002, a decline of 65 percent, earnings partially recovered over the next two years, rising to \$254 million by 2004.

As one would expect, higher overall prices also increased employment in the salmon fisheries in 2003 and 2004. (See Exhibits 4 and 5.) Specifically, the strong increase in 2004 king salmon prices raised employment for February and March, the months when most winter kings are caught in Southeast Alaska. Employment

⁴ Knapp, Gunnar. *Projections of Future Bristol Bay Salmon Prices*. University of Alaska: Institute of Social and Economic Research, 2004.

in February climbed from 134 in 2002 to 258 in 2004, and March employment rose from 204 to 327 over the two-year period.

Groundfish employment follows the same pattern as salmon

Salmon generates more jobs than any other fishery, but in terms of volume and value of the catch, the state's largest fishery is groundfish, where a fairly small number of large boats catch an enormous amount of fish, predominantly pollock, without requiring a lot of manpower.

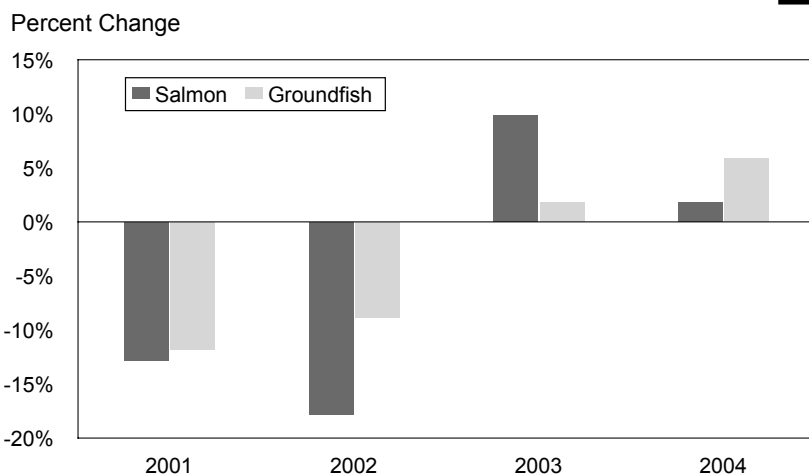
Groundfish harvesting employment declined almost 20 percent from 2000 to 2002 before reversing course and adding about 8 percent from 2002 to 2004. (See Exhibits 4 and 5.) The reasons for the decline and partial recovery are not as clear-cut as they were with salmon where price changes had such an obvious effect. Pollock prices from 2000 to 2004 were low by historical standards and relatively static.

Earnings in the sablefish fishery fell noticeably in 2001 before recovering strongly in 2003, which may account for part of the employment growth. Harvesters caught a significantly higher volume of sablefish in 2003 as well, indicating healthy stocks and an increased quota.

Halibut is down slightly, crab rose then fell

Alaska's halibut fishery is managed by the International Pacific Halibut Commission using individual fishing quotas, or IFQs, which grant a certain percentage of a regional fishery's total allowable catch each year to individual permit holders. Because of this system, and because halibut stocks have been relatively constant in recent years, the number of jobs has also been relatively constant. (See Exhibit 5.) Small declines in 2003 and 2004 may have been caused by a consolidation of quota shares. Individuals are allowed to own multiple IFQs as long as their total share doesn't exceed a specified percentage of the total halibut quota for the region.

Salmon and Groundfish Employment Percent Change, 2001-2004 **4**



Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

Employment in the crab fishery moved in opposite directions from salmon and groundfish, growing from 2000 to 2002 before dropping off in the next two years. (See Exhibit 5.) Responsible for about 7 percent of all harvesting jobs in 2004, the crab fishery's peak employment months are roughly the opposite of salmon. The Bering Sea opilio crab fishery reaches full strength in January and February, and the Bristol Bay red king crab fishery pushes employment way up in October. Most of the jobs in the in-between months are concentrated in Southeast's dungeness crab fishery.

Harvesting employment by region

Nearly all of Alaska's fish harvesting employment is accounted for by three broad regions: Southwest, Southeast and the Gulf Coast. In the Northern region, less than 100 jobs come from the salmon, crab and herring fisheries.

In recent years, the Southwest region has had the largest share of fish harvesting employment, nearly 44 percent in 2004. (See Exhibit 6.) It's also the region that suffered the steepest loss from 2000 to 2002, a 25 percent decline in employment. (See Exhibit 7.) Of the more than 900 jobs lost over those two years, 83 percent were in the salmon fishery. A moderately

5 Fish Harvesting Employment Estimates 2000-2004

All Regions and Species

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Mo. Avg.
2000	3,154	4,180	4,759	5,715	6,957	19,698	22,099	13,670	7,198	5,077	2,106	856	7,956
2001	2,639	4,172	4,160	4,025	5,849	17,132	20,350	12,760	7,068	5,256	2,229	712	7,192
2002	3,321	3,847	4,000	4,191	5,626	14,867	17,056	10,980	6,101	4,906	2,343	520	6,477
2003	*	*	*	*	*	*	*	*	*	*	*	*	6,657
2004	*	*	*	*	*	*	*	*	*	*	*	*	6,742

Total Crab Fishery

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Mo. Avg.
2000	70	510	183	1,434	129	439	368	337	170	1,660	285	69	471
2001	593	1,626	237	141	117	462	505	490	156	1,591	454	126	541
2002	1,360	1,499	255	162	66	527	529	573	185	1,772	514	77	626
2003	1,230	924	205	78	27	451	468	435	168	1,734	497	91	526
2004	1,314	707	228	36	18	466	451	460	103	1,716	275	76	487

Total Groundfish Fishery

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Mo. Avg.
2000	2,915	3,447	3,097	2,470	1,495	1,063	1,088	1,511	1,774	1,289	601	459	1,767
2001	1,907	2,354	2,394	1,966	1,345	1,159	1,378	1,544	2,232	1,393	598	387	1,555
2002	1,735	2,113	2,491	1,591	1,105	958	1,357	1,556	2,006	1,120	733	224	1,416
2003	1,889	2,258	2,226	1,835	1,379	1,053	1,410	1,710	1,909	1,014	569	55	1,442
2004	1,939	2,350	2,186	1,950	1,472	1,229	1,443	1,753	1,959	1,435	652	52	1,535

Total Halibut Fishery

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Mo. Avg.
2000	0	0	1,017	1,393	2,189	1,939	1,563	1,930	1,793	1,122	661	0	1,134
2001	0	0	1,074	1,322	1,956	2,121	1,616	2,022	1,717	1,172	671	0	1,135
2002	0	3	744	1,488	2,039	2,367	1,833	2,030	1,574	970	572	0	1,132
2003	0	0	1,010	1,483	1,697	2,160	1,604	1,969	1,488	1,110	609	0	1,092
2004	*	*	*	*	*	*	*	*	*	*	*	*	1,081

Total Herring Fishery

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Mo. Avg.
2000	0	0	238	92	2,016	513	88	0	0	0	0	33	248
2001	17	0	245	288	1,269	425	67	0	0	0	5	11	194
2002	6	6	270	681	1,210	65	97	0	0	8	0	17	196
2003	6	5	264	1,087	962	0	64	0	5	0	5	11	201
2004	0	0	248	797	1,028	0	46	0	5	5	0	6	178

Total Miscellaneous Shellfish Fishery

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Mo. Avg.
2000	106	103	35	43	129	96	98	92	48	700	388	171	167
2001	53	73	31	44	129	101	66	69	33	738	346	112	150
2002	125	93	36	32	122	91	95	77	45	655	443	140	163
2003	*	*	*	*	*	*	*	*	*	*	*	*	160
2004	*	*	*	*	*	*	*	*	*	*	*	*	156

Total Salmon Fishery

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Mo. Avg.
2000	64	121	189	283	999	15,649	18,894	9,801	3,413	307	171	125	4,168
2001	70	119	180	265	1,034	12,865	16,717	8,635	2,931	362	155	76	3,617
2002	95	134	204	238	1,085	10,860	13,145	6,744	2,291	383	82	62	2,943
2003	121	247	251	270	1,179	12,361	14,568	6,369	2,685	469	172	159	3,237
2004	118	258	327	384	1,132	11,962	14,515	6,959	3,277	391	171	173	3,305

* There were insufficient data to make reliable monthly estimates for the halibut fishery in 2004 and for the miscellaneous shellfish fishery in 2003 and 2004. Monthly averages for those fisheries and years represent estimates based on annual data available from other sources.

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

strong recovery in salmon jobs in 2003 pushed Southwest employment 8 percent higher. Employment in 2004 then fell off slightly due to small declines in several fisheries.

The employment picture in Southeast was significantly more stable over that same period. The total job count fell by about 9 percent from 2000 to 2003 before recovering by 2.4 percent in 2004. As with the Southwest region, most of the changes were the result of a decline and partial recovery in the salmon fishery, which was responsible for more than 44 percent of all Southeast harvesting employment in 2004.

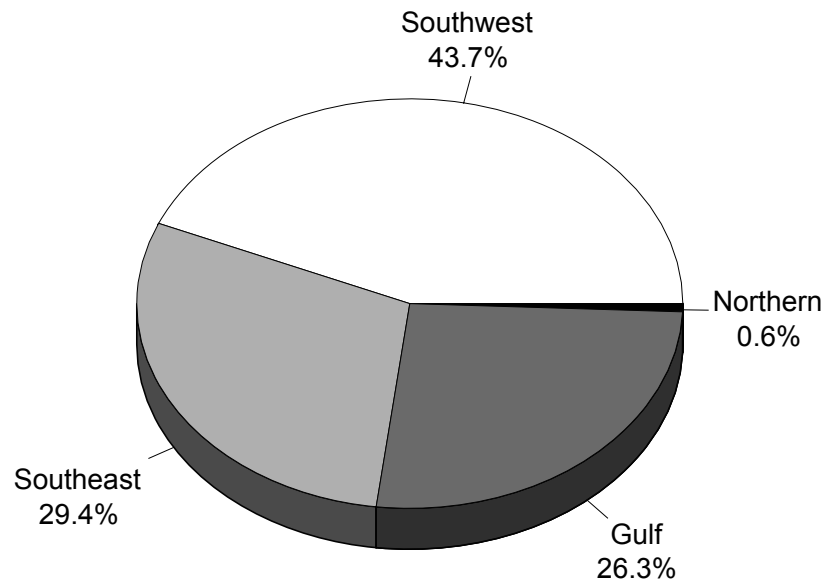
Employment in the Gulf Coast region followed the same basic pattern as the Southwest region – a steep decline from 2000 to 2002, followed by a moderate recovery from 2002 to 2004. Again, the principal cause of the movement was the salmon fishery, which provided just over 50 percent of all Gulf Coast harvesting jobs in 2004.

As noted, salmon jobs dominate in all three regions, accounting for about 50 percent of the employment. (See Exhibit 8.) In the Southwest and Gulf Coast regions, groundfish was the next most important category in terms of jobs provided, while in Southeast, halibut had the second-highest job count in 2004, followed by groundfish. The crab fishery also provided a significant number of jobs in 2004 in the Southwest and Southeast regions – 264 and 161, respectively. In the Gulf Coast region, crab harvesting employment hovered around 50 from 2001 to 2004. Herring and shellfish provided a smattering of employment across the Southwest and Gulf Coast regions, while they combined to a more significant sum in Southeast (239 in 2004).

Fishing's role in the state and local economies

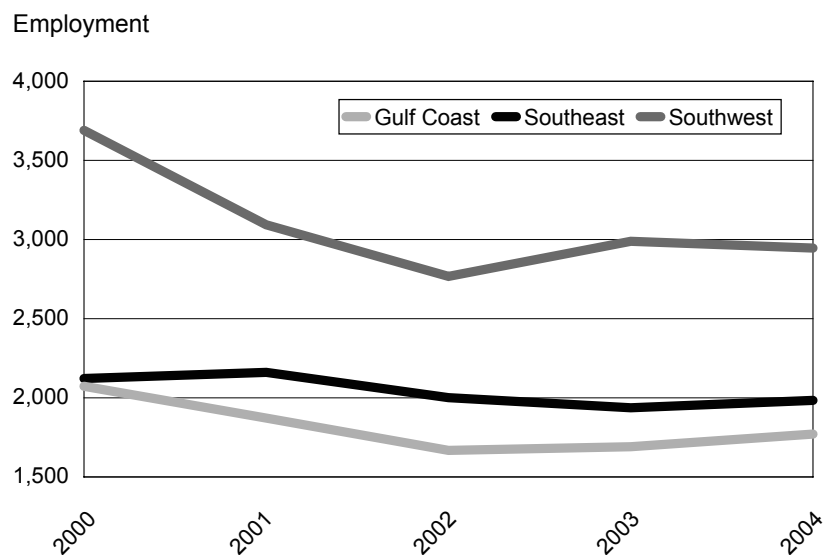
After falling a precipitous 18.6 percent from 2000 to 2002, total fisheries employment bounced back to grow 4.1 percent from 2002 to 2004. Over the latter period, fishing jobs grew at a faster rate than some

Percent of Employment by Region Alaska fisheries, 2004 **6**



Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

Harvesting Employment by Region Alaska fisheries, 2000-2004 **7**



Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

of the state's major industries and outpaced total employment growth. (See Exhibit 9.)

In 2004, the state's 6,742 fish harvesting jobs made up 2.9 percent of all private-sector jobs.⁵ (See Exhibit 10.) When the fishing

industry is defined to include both harvesting and seafood processing, it accounts for 6.6 percent. That number is up slightly from 2002 when the fishing industry represented about 6.3 percent of the private sector. For comparison, the oil and gas industry in 2004 provided 3.6 percent of private-sector jobs and the construction industry 7.7 percent.

In the Southeast, Gulf Coast and Southwest regions of the state – the three regions with nearly all of the state's fish harvesting employment – the fishing industry's contributions are significantly greater. (See Exhibit 11.) Fish harvesting and processing combine to make up 14 percent of Southeast Alaska's private-sector economy. In the Gulf Coast region, about 18 percent of private-sector jobs are either in fish harvesting or processing. In Southwest Alaska, the fishing industry accounts for just over half of all private-sector employment.

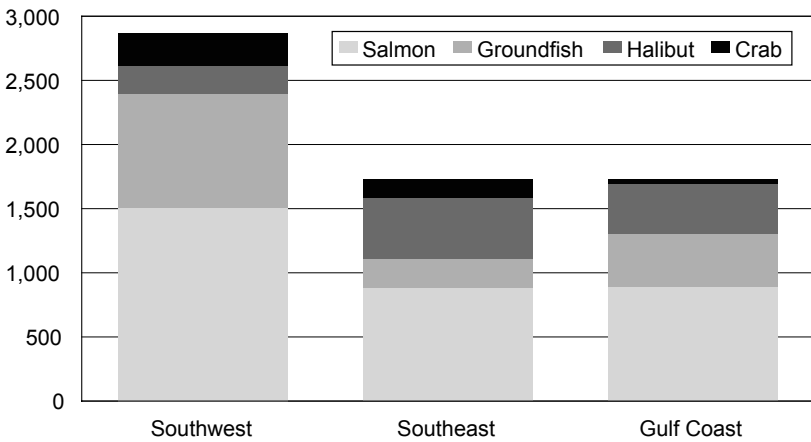
These numbers, as high as they are, understate the importance of fishing to the three regions. The millions of dollars in harvest value paid to commercial fishermen support a substantial portion of the remaining private sector in these regions, especially in Southwest Alaska. Other than a small amount of mining employment, fishing is the Southwest region's only basic sector employer. The remaining private employment consists of industries such as retail trade, construction and health care that provide goods and services to the local population. It's no exaggeration to say that many Southwest Alaska communities – and others scattered throughout Southeast Alaska and the Gulf Coast region – would virtually disappear without fishing.

Salmon runs create most of the seasonality

Commercial fishing, like many industries in Alaska, is highly seasonal when the total job count is considered. (See Exhibit 12.) A closer look, however, reveals that most of the seasonality comes from the salmon

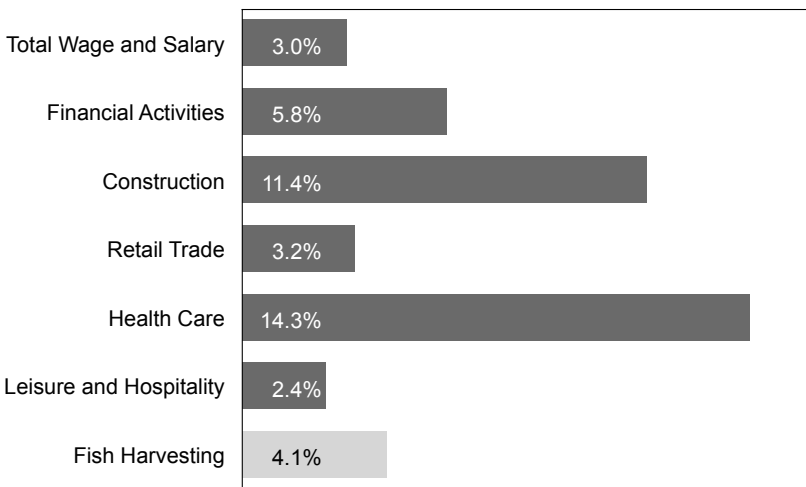
8 Harvesting Employment by Species Alaska fisheries, 2004

Employment



Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

9 Employment Growth Statewide Selected industries, 2002-2004



Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

⁵ "Private-sector jobs" is defined here to mean all private wage and salary jobs combined with the fish harvesting employment discussed here. Self-employment, employment in industries not covered by state unemployment insurance laws and all other agricultural employment is excluded.

fishery, and that both the groundfish and halibut fisheries provide a relatively constant stream of jobs over much of the year.

What's more, high January and February employment in the crab fishery fills in during two of the three months when there is very little halibut fishing activity. Overall, Alaska's fisheries provide a considerable number of jobs in every month but December.

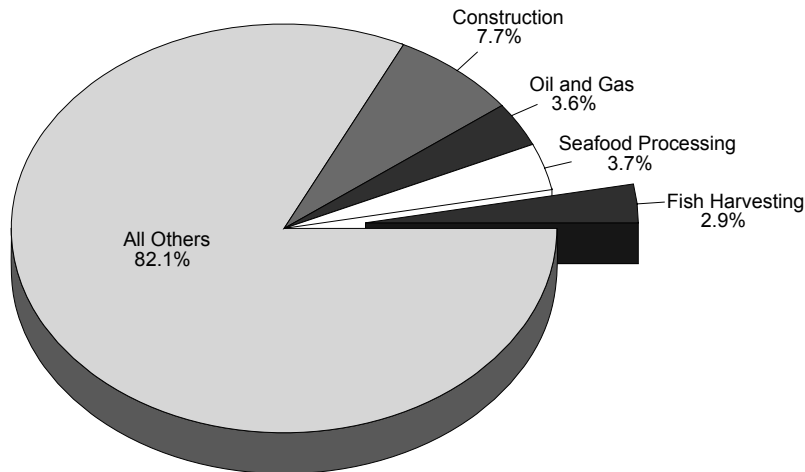
The Southwest region's massive summer salmon runs amplify its seasonal pattern of employment, while in the Southeast and Gulf Coast regions, the distribution is a little more even. (See Exhibit 13.) Southwest Alaska regularly goes from having no salmon harvesting employment at all in the first five months of the year to as many as 10,000 jobs during the peak months of the summer.

Conclusion

The fish harvesting employment estimates discussed in this article are a relatively new addition intended to fill a gap in the employment data provided in *Trends* and elsewhere by state and federal agencies. Because the methodology is still under review, the numbers should be considered preliminary, although significant changes are unlikely.

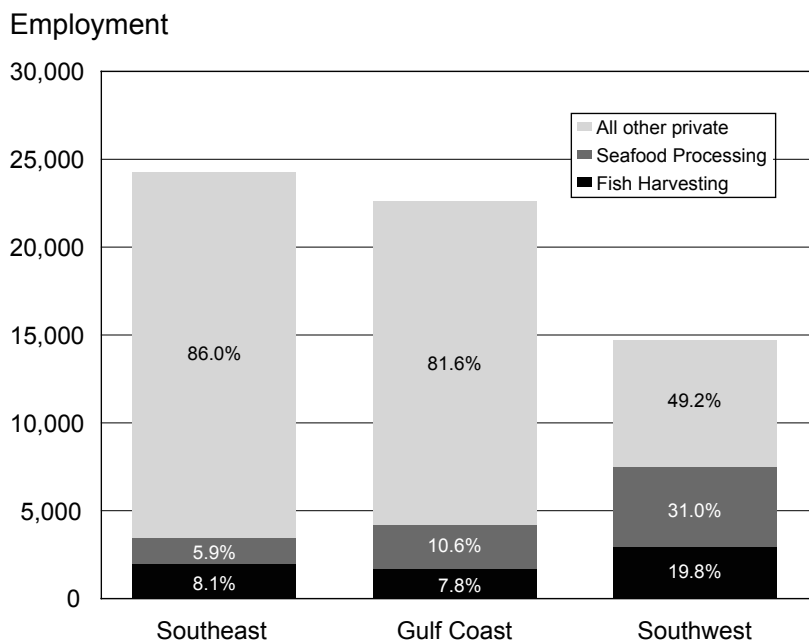
Alaska is a state rich in natural resources and one of the most important is fish. Almost 4 billion pounds were harvested in 2004, generating close to \$1 billion in gross earnings, more than 6,700 direct jobs and the core economy for much of coastal Alaska. After more than a decade of declines, there were distinct signs of improvement in the salmon fishery in 2003 and 2004, although few would deny that there is a lot of ground to recover or that significant economic challenges remain. Led by salmon and groundfish, total employment grew by 265 jobs from 2002 to 2004, a welcome change in direction after a total decline of nearly 1,500 jobs over the two previous years.

Private-Sector Employment Alaska, 2004 10



Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

Private-Sector Employment By industry and region, Alaska 2004 11

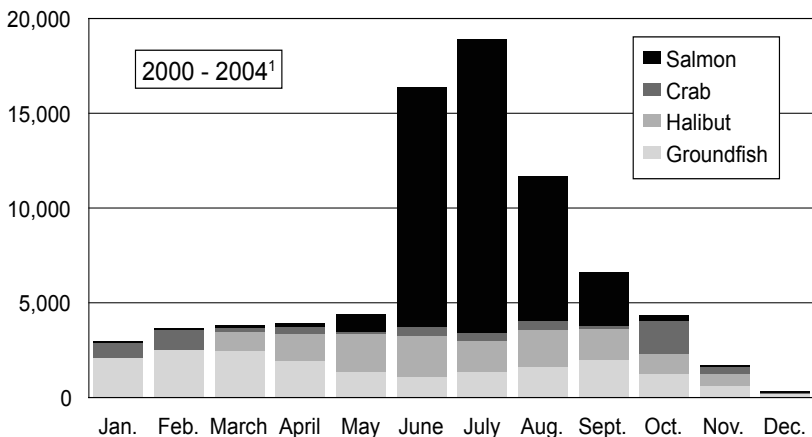


Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

12 Only Salmon is Highly Seasonal

Average monthly employment by species

Employment



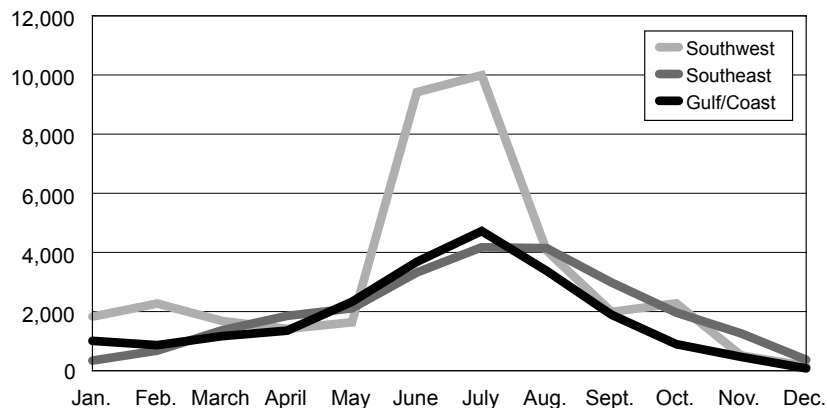
¹ These are averages for each month for the years 2000 to 2004. Halibut averages are for 2000 to 2003; no monthly data are currently available for 2004.

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

13 Southwest is the Most Seasonal

Average monthly employment, 2000-2004¹

Employment



¹ Where no monthly data were available, estimates were used from the patterns from the previous years and annual totals.

Source: Alaska Department of Labor & Workforce Development, Research and Analysis Section

Developing a Methodology

by Michael Patton and Dan Robinson,
Economists

In other industries, the Alaska Department of Labor & Workforce Development can accurately count jobs because nearly every employer is required to report the number of wage and salary employees on their payroll each month as part of their mandatory unemployment insurance coverage. But fish harvesting jobs are generally excluded from unemployment insurance coverage and the taxes that pay for it. Even if they weren't, crew members on fishing boats are nearly always paid a share of the earnings rather than a wage or salary. As a result, fishing jobs don't generate the payroll records used to calculate monthly employment in other industries.¹

Landings and crew factors

As a substitute for detailed payroll records, state and federal fish management agencies provide the Department of Labor with information on the specific "landings" made under each permit over the course of the year. A landing is the initial sale of harvested fish to a buyer.² To then create employment estimates from landing records, the Department of Labor uses an on-going survey of permit holders to develop "crew factors" which quantify the labor needed to fish specific permits in their associated region, species and gear type.

For example, survey responses indicate that it takes an average of six crew members to fish for king

¹ Another reason why no employment data have been available for the fisheries is that the U.S. Bureau of Labor Statistics, which governs how employment is counted in the federal-state cooperative program called Current Employment Statistics, defines fishing as an agricultural activity and agricultural employment has traditionally been excluded from employment statistics under this program.

² The majority of landing data come from mandatory fish ticket reporting. Data for groundfish catcher processors – who are not required to file fish tickets – are provided by the National Marine Fisheries Service as compiled by the Alaska Fisheries Information Network, a network of five federal and state agencies.

crab with pot gear on a vessel over 60 feet long in Bristol Bay – a permit with the designation K91T. If a landing is recorded in January under a K91T permit, the Department applies the crew factor of six for that permit. In other words, six monthly jobs were created. Every permit number is unique – the K91T used in this example is a type of permit or a permit for a specific fishery rather than the permit number itself – which allows the Department to assign only one set of jobs to a specific permit in any one month even if numerous landings are made during the month. The same concept applies to counts of payroll employment in that a person who works 60 hours a week for a single employer is counted the same as a person who works 20 hours a week.³ Each is said to hold one job.

A final point is that the jobs are assigned by place of work rather than by the residence of the employees. Most permits have a geographic designation as to where specific species can be harvested and with what type of gear. In the above example using a K91T permit, the K stands for king crab, the 91 stands for pot gear on a 60-plus-foot vessel and the T stands for Bristol Bay. All landings made under that type of permit create employment assigned to Bristol Bay and aggregated to the Southwest region. Employment generated under permits that allow fishing anywhere in the state is assigned by a special harvest area code.

The estimates are conservative

For a few reasons, the estimates may slightly undercount employment generated by Alaska's fisheries. First, the estimates don't reflect the amount

of time spent by permit holders and their crew preparing to fish or winding up operations after the fishing is done for the year. Until a permit holder makes a landing, no employment is tallied, so if the permit holder works for two weeks in May getting the boat ready to fish and then begins making landings in June, the efforts in May are not counted, despite their obvious importance to the enterprise. The Department of Labor has begun surveying permit holders to determine how much preparation time is required in each fishery and will include those efforts in future estimates.

Another way the estimates are conservative is in their selection of the permit holder as the employer. When a permit holder makes landings under two different permits in the same month, only the permit with the highest value catch is assigned employment in that month. In other words, if Ishmael Jones lands fish under both a salmon permit and a sablefish permit in June, and he was paid more for the salmon, he will be credited with generating jobs only under the salmon permit.⁴ The assumption under this approach is that crew members who work for the same permit holder and fish for both salmon and sablefish in the same month are analogous to employees who perform different duties for one employer during a month.⁵

³ Whenever possible, the Department of Labor adhered to the same concepts it uses to calculate payroll employment in other industries in cooperation with the U.S. Bureau of Labor Statistics. Doing so allows for the most meaningful comparisons between the two.

⁴ An alternative approach would have been to view the permit itself as the employer, irrespective of ownership, and assign employment to the permit in every month for which it is used to make landings. This approach would be more analogous to a person working during one pay period for two different companies owned by the same person.

⁵ Some permit holders may hire different crew members to fish their different permits. Since crew members are not specifically identified in the fish tickets that record landing data, turnover of this type can't be captured.