OREGON Fish & Wildlife
Marine Resources

36th Annual

Pink Shrimp Review

2025

What's Inside

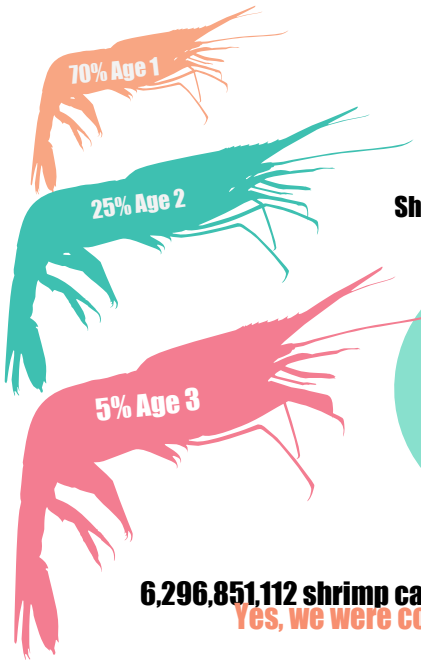
Visit Our Website:
www.dfw.state.or.us/MRP/shellfish/commercial/shrimp

This newsletter provides a summary of Oregon's 2024 pink shrimp (*Pandalus jordani*) season including trends in the fishery, its stock, and information relevant to stakeholders. Oregon's pink shrimp fishery is managed sustainably in cooperation with shrimpers, processors, and scientists.

The 2024 pink shrimp season was very productive, seeing the highest catch volume since 2015. Shrimp abundances were high, but market demand seemed low. 2024 catch volume was 49.4 million pounds, 4th highest among the fishery's 68 year history! The ex-vessel value of the fishery was high (26.6 million USD). Price per pound was low at an average of $0.54 per pound. Catch rates were at their highest rate of all-time (1,050 pounds per hour for double rig vessels), owing to recent high recruitment of shrimp and modern fleet efficiency.

2024 Season

Shrimp age by number



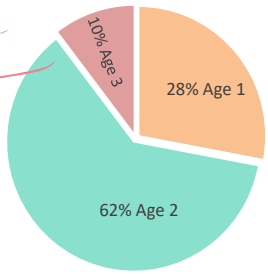
49.4 million pounds landed

Catch area

$26.6 million ex-vessel value

60 Vessels

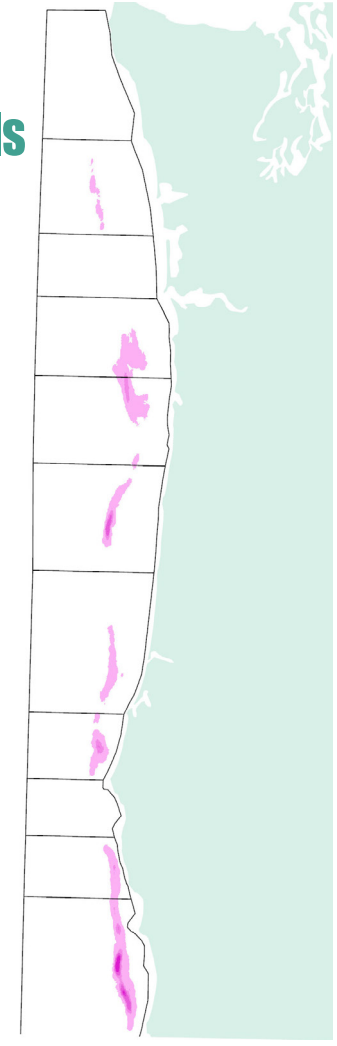
Shrimp age by weight



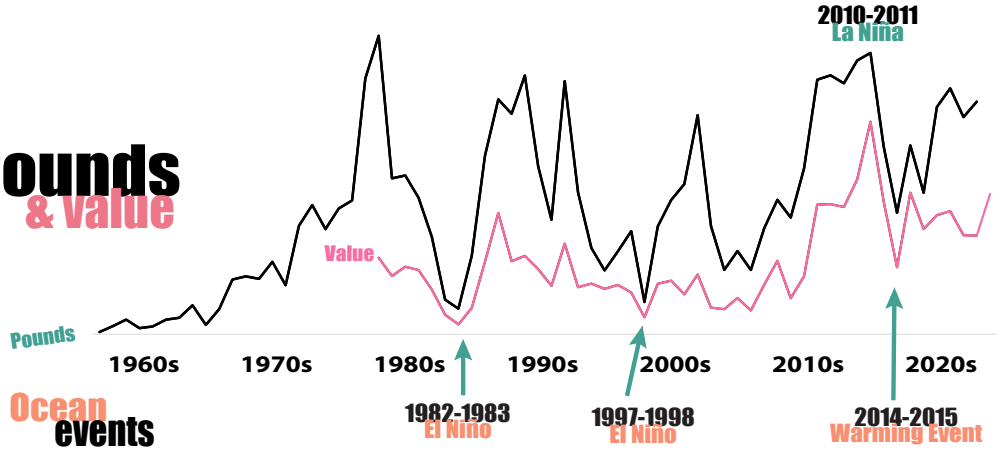
Highest average landing EVER!!!

Most catch since 2015

6,296,851,112 shrimp caught
Yes, we were counting!



Pounds & Value



2024 Season Summary

Landings Data

In 2024, Oregon's pink shrimp landings were outstanding. 49.4 million pounds were landed, the 4th highest among the 68 year history (Figure 1), the only years higher were 1978, 2014, and 2015. Almost 50 million pounds!

Sixty vessels landed shrimp into Oregon in 2024 (Figure 2) accounting for 899 individual trips (Figure 3). Fewer vessels than average and fewer trips than average, but consistent with the modern fishery.

On average, 54,994 pounds were landed per trip, the highest in the fisheries history (Figure 4)!

Good hold-over from last year's stock combined with good age-one recruitment made for exceptional shrimping. The presence of older, larger shrimp combined with careful fishing early in the season helped make catch rates outstanding.

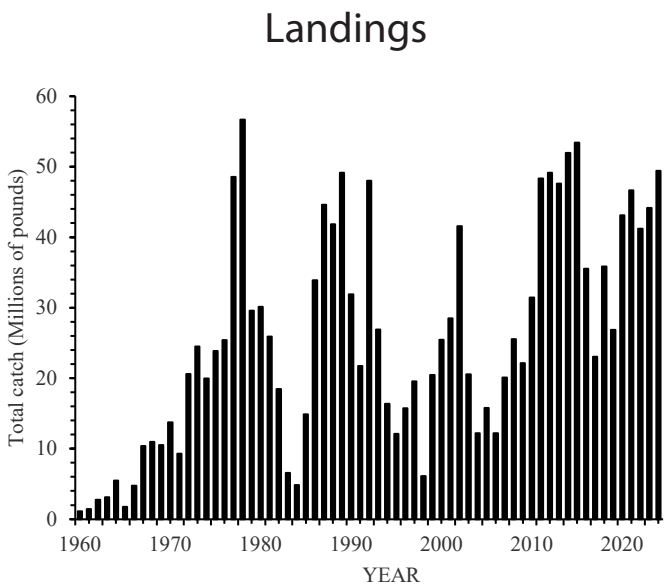


Figure 1. Landings of pink shrimp into Oregon by year: 1957-2024.

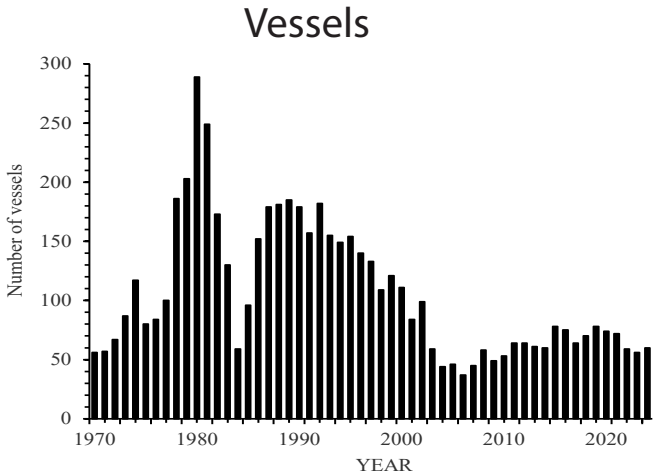


Figure 2. Number of vessels landing pink shrimp into Oregon, by year: 1970-2024.

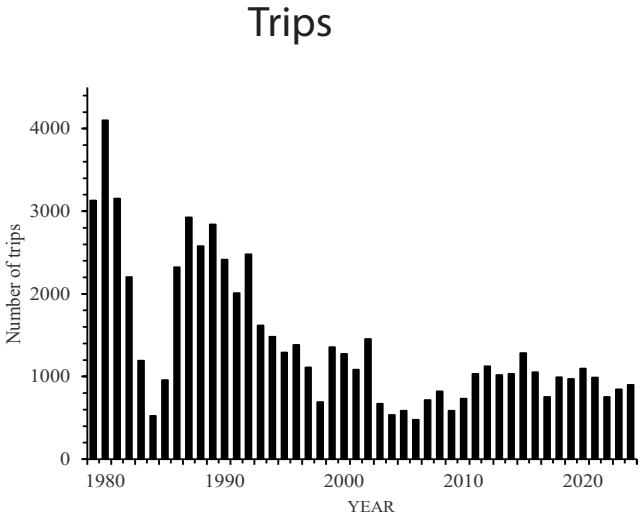


Figure 3. Number of trips landing pink shrimp into Oregon, by year: 1979-2024.

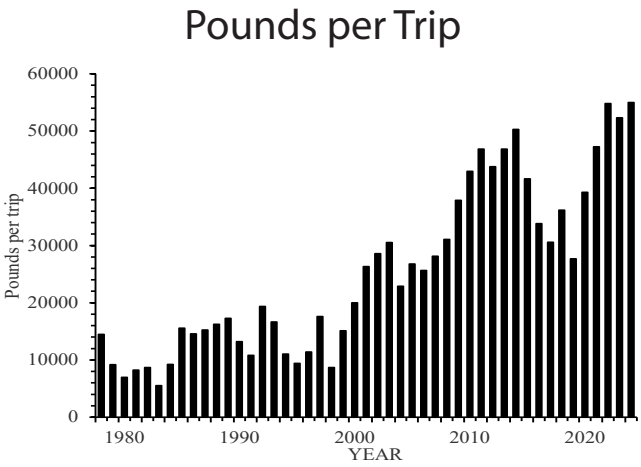


Figure 4. Average catch-per-trip (pounds) for pink shrimp vessels landing into Oregon, by year: 1978-2024.

2024 Catch Area

Catch in 2024 was highest off Northern California and southern Oregon, but excellent throughout the region and the season. Catch started out slow as price was negotiated and count per pound decreased (Figure 5).

A heatmap shows tow locations for Oregon landed pink shrimp catch (Figure 7).

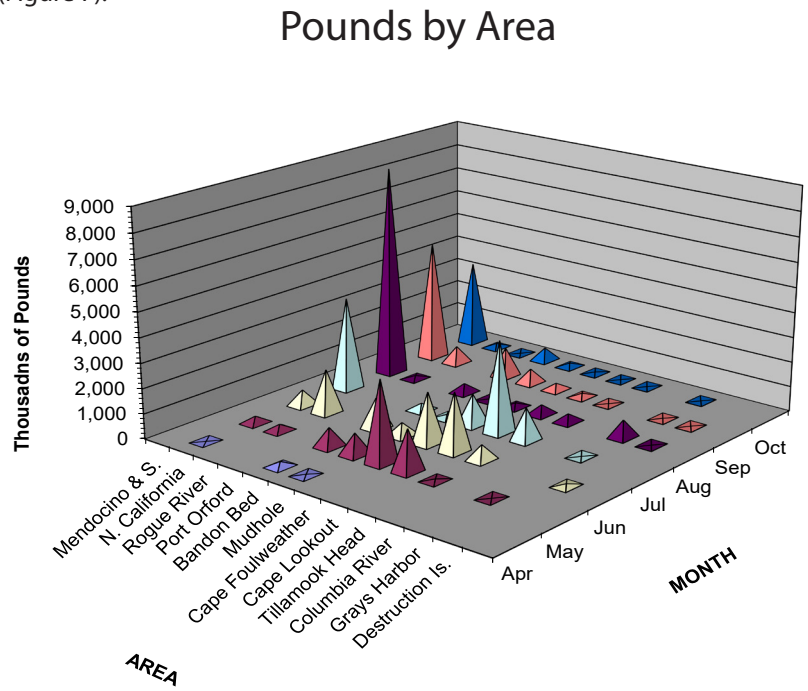


Figure 5. Total pounds of pink shrimp caught in each area and month landed into Oregon, 2024.

Trips remained short in 2024, with a slight increase when compared to the last two years. Vessels averaged 22.6 hours (in double rig equivalent hours) of tow time per trip, similar to the high efficiency years in the early 2010s (Figure 6). Overall, the amount of time fishing per trip has reduced over time, as the fleet continues to become more efficient.

Figure 6. Hours (expressed in Double Rig Equivalent (DRE)) of fishing per trip into Oregon, 1993-2024.

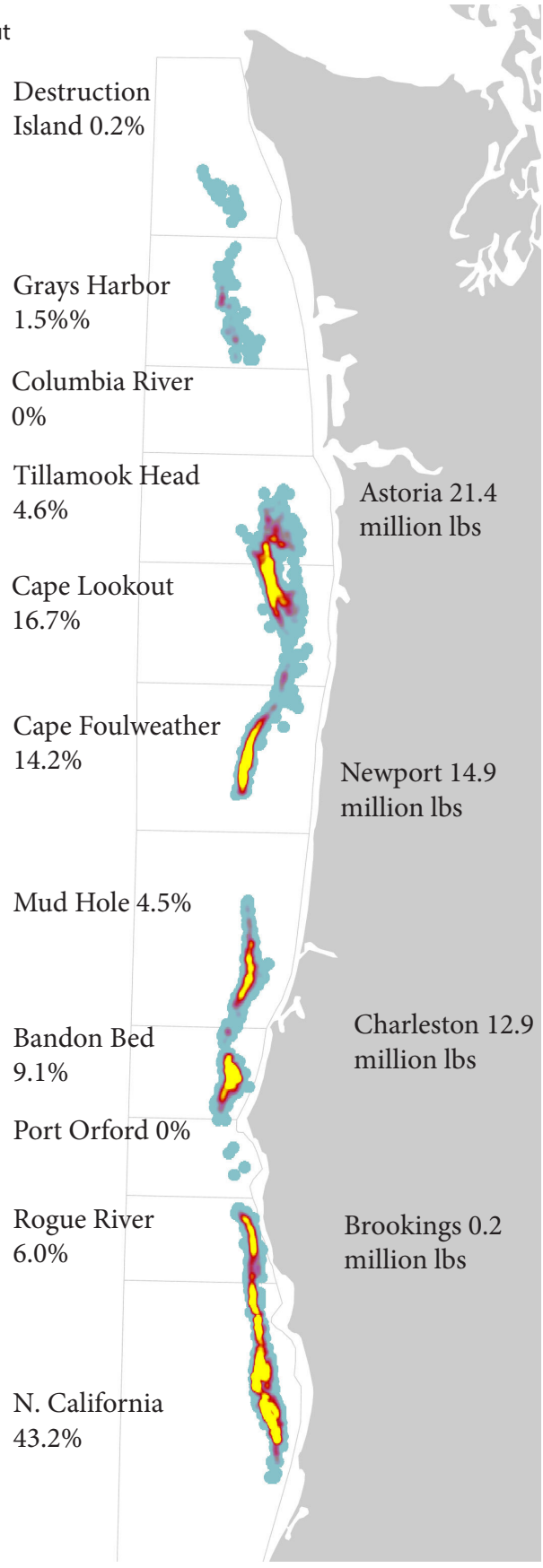


Figure 7. Heat map of pink shrimp catch by state statistical areas for 2024 Oregon landings, and amount of pounds delivered to each port.

Effort

Effort (number of hours the fleet fished) continued to be low when compared to historical rates. Effort was most focused at Cape Lookout and Northern California during summer months (Figure 9).

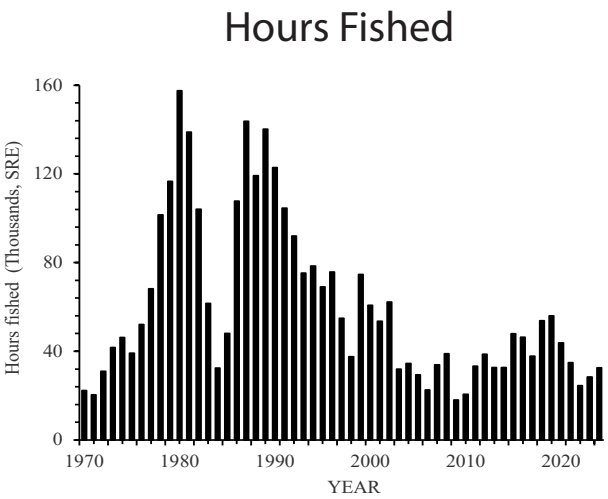


Figure 8. Total hours (SRE) fished for pink shrimp landed into Oregon, by year: 1968-2024.

Hours of effort are displayed in units of Single Rig Equivalent (SRE) hours, meaning that single rig hours are counted 'as is' and double rig hours are multiplied by 1.6.

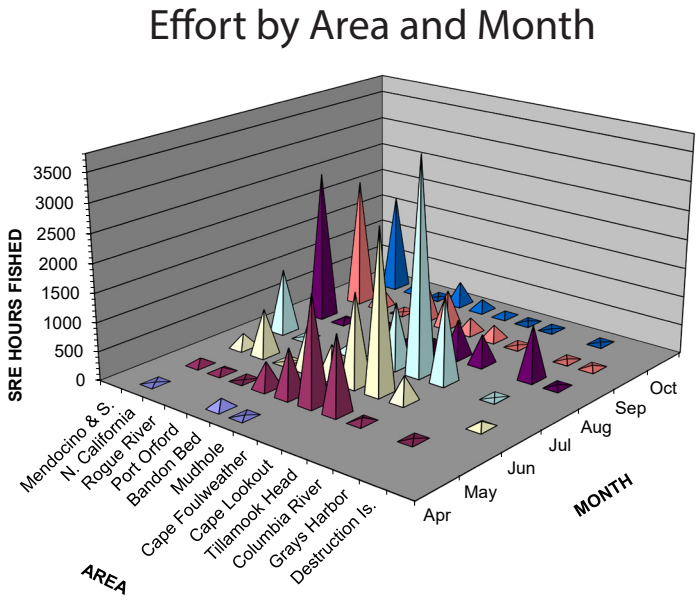


Figure 9. Total hours (SRE) fished for pink shrimp landed into Oregon, by area and month, 2024.

Efficiency

Efficiency, expressed in Catch Per Unit of Effort (CPUE) remained high. Shrimp were caught at a rate of 1,520 lbs of shrimp/ hour SRE (950 lbs/hour in double rig terms)(Figure 10). Highly efficient shrimpers working a massive stock of shrimp drove this amazing catch rate.

Catch was excellent just about everywhere; however, the productivity of Northern California was particularly good (Figure 11).

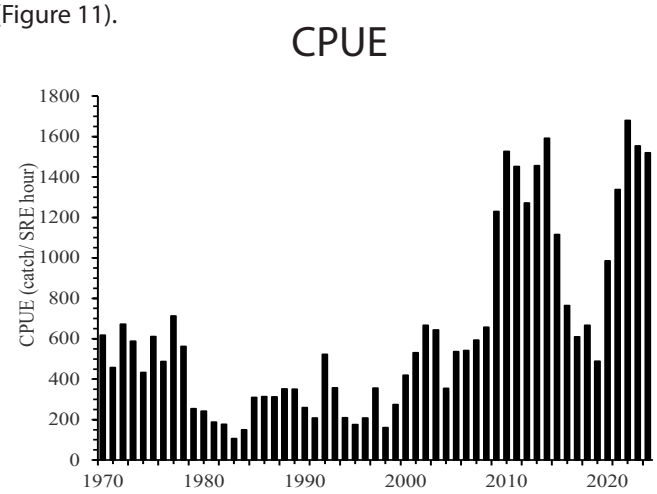


Figure 10. Average CPUE (SRE) for Oregon pink shrimp landings, by year: 1968-2024.

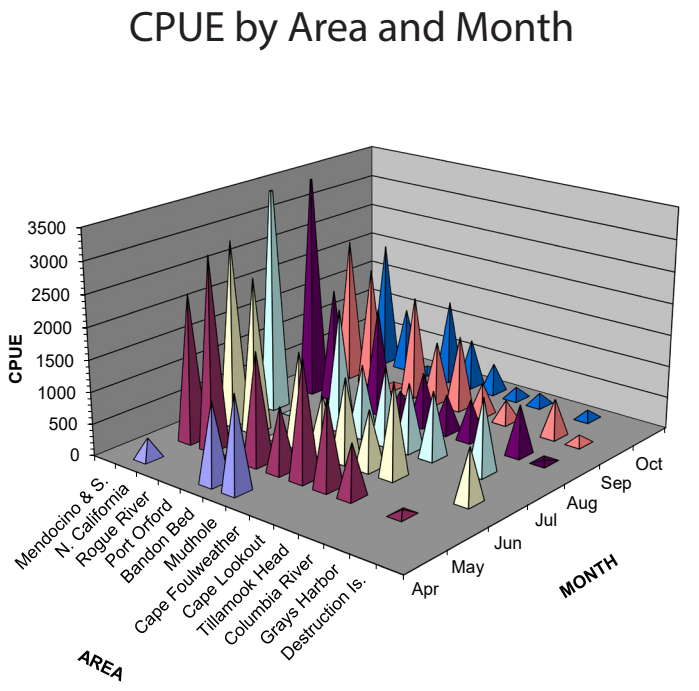


Figure 11. Average CPUE (SRE) by area and month for Oregon pink shrimp landings, 2024.

Value

Ex-vessel value was high in 2024 (26.6 million USD), our 4th most valuable season (not adjusted for inflation) behind 2015, 2014, then 2018 (Figure 12).

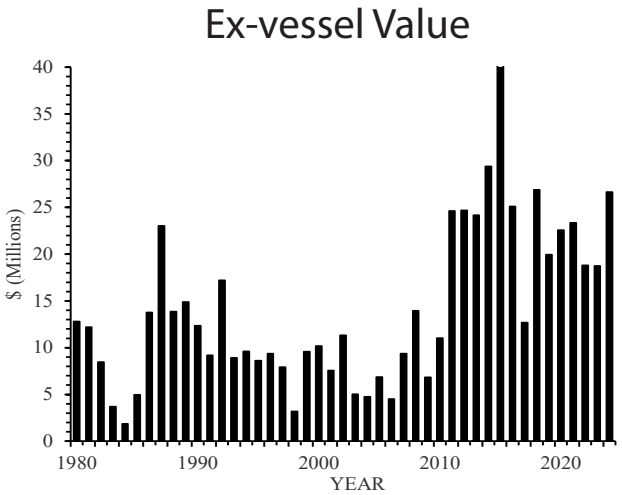


Figure 12. Ex-vessel value (USD) of pink shrimp landed into Oregon, by year: 1978-2024.

At $0.54 per pound, the average price has increased following three years of declining price per pound (Figure 13). Values are nominal (i.e., not adjusted for inflation). This was our 17th highest price, dating back to 1968.

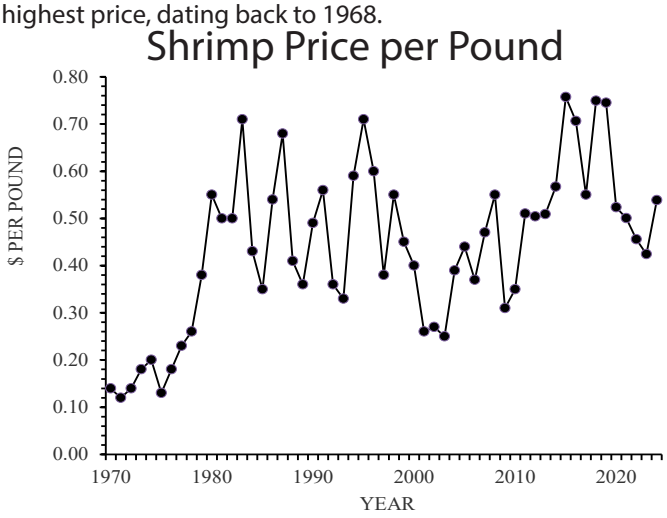


Figure 13. Average ex-vessel price-per-pound of pink shrimp landed into Oregon, by year: 1968-2024.

Age and Size

Pink shrimp live short lives and grow quickly; catch is typically composed of three year classes (age one, two and three). In most years, catch depends heavily on age one shrimp.

By number of (individual) shrimp, 69.6% were age one, 25.1% were age two, and 5.3% were age three (Figure 14).

By weight, older shrimp (age two and three) made up about 47% of the catch (Figure 15), despite only being about 30% of the catch by individual numbers.

Mean count per pound was 127 shrimp/lb, remaining consistent with last year (Figure 16). Higher average counts were likely affected by the high density of shrimp (causing slower growth) and strong age one shrimp recruitment in 2024.

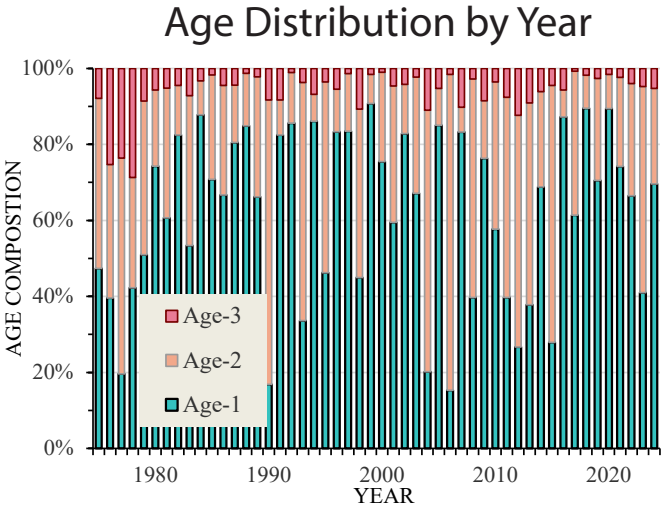


Figure 14. Age composition of pink shrimp landed into Oregon, by year: 1975-2024.

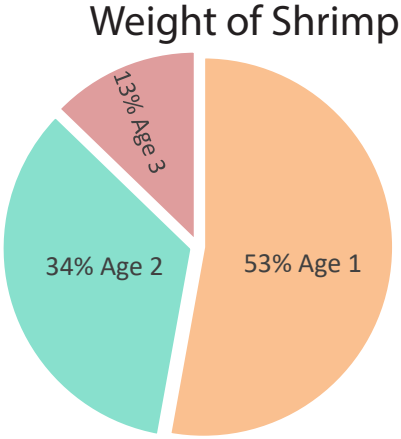


Figure 15. Weight of pink shrimp, landed into Oregon, 2024.

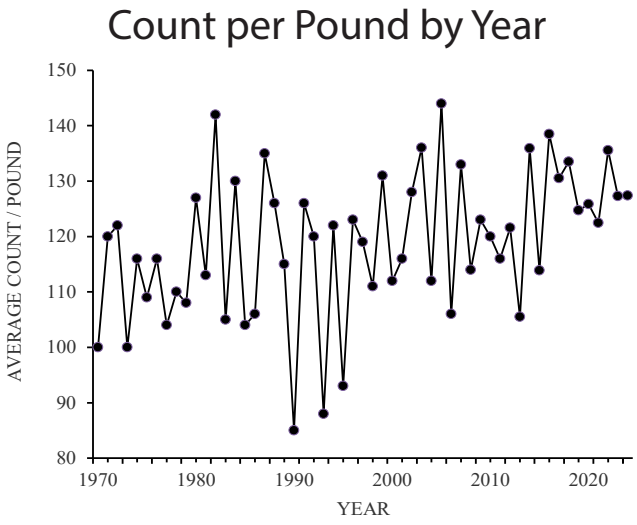


Figure 16. Average count per pound of pink shrimp landed into Oregon, by year: 1966-2024.

2025 Indicators

Here we describe some of the indicators that provide a forecast of what to expect next season.

"Enthusiasm is common. Endurance is rare."
-Angela Duckworth

Environmental Conditions

By comparing past pink shrimp population levels to past environmental condition, we can forecast future pink shrimp abundance based on current environmental conditions. Pink shrimp recruitment has a strong relationship to oceanographic conditions during their larval period (Figure 17). Specifically, sea level height (SLH) at Crescent City, CA during the pink shrimp's larval period has shown a strong link to recruitment levels in Oregon; the lower the sea level, the greater recruitment.

Why sea level? While it may not matter to a pink shrimp if there are a few extra inches of water above their head or not, the average height of the sea does correlate to environmental conditions that are known to affect pink shrimp larvae (larval transport, food supply from upwelling, etc.), thus providing a single indicator to predict recruitment.

In 2025, pink shrimp catch will be composed of three year classes (those born in 2022, 2023, and 2024). Overall, it looks pretty good for 2025. Incoming age 2 and 3 cohorts have been strong at previous ages and incoming age one shrimp experienced an excellent larval environment.

2024 year class: The environmental conditions which larval pink shrimp experienced in 2024 were excellent. When compared to the past 44 years it was in the 70th percentile. Age one recruitment is typically the largest component of the fishery, by number.

2023 year class: The environmental conditions of 2023 were not expected to be good for shrimp recruitment, but lo and behold, this year class has been very strong. Over 2 billion age one shrimp were caught last year in Oregon alone. Particularly strong on the North Coast. In 2024, this year class will be age two and are expected to be a strong component of catch.

2022 year class: In 2025, we're hopeful that a good proportion of the catch will be these three year old shrimp. They had a good larval environment to recruit to in 2022 and have anchored catch the past two years. Historically, there are few three year olds left to catch, but they are so large that they have an unequal part of the catch by weight.

Worth noting is that some age zero shrimp were caught in 2024, not a bad sign.

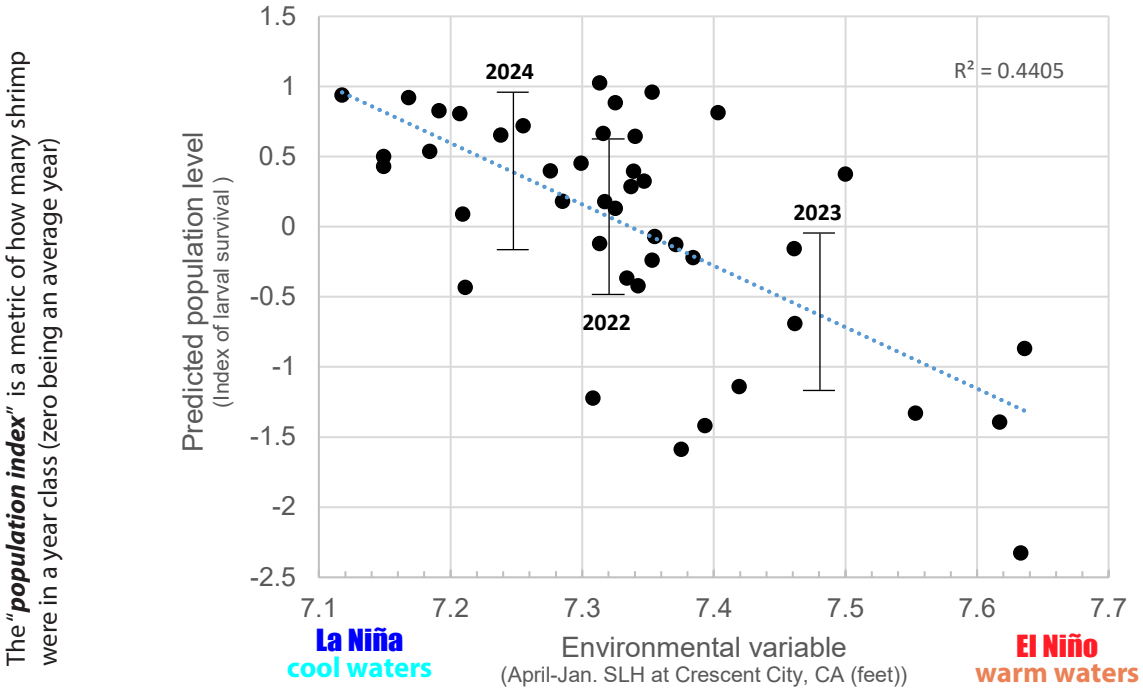


Figure 17. Pink shrimp population/ environmental model.

Each dot on this graph represents a year (1979-2024).

Vertical lines labeled with year represent the range of population expected, given the environmental conditions in the year they are released as larvae.

The "***environmental variable***" used is sea level height (SLH) from April to January in Crescent City, CA.

Sampling Data

Crustaceans lack hard structures for aging, such as ear bones (otoliths) used in fish aging, thus other means must be used. Pink shrimp simultaneously release eggs, grow quickly, and live short lives. These three attributes allow for age assignment using statistical (multi-modal distribution) analysis. In this way, ages of shrimp are determined by bulk measurement of their size over time. Size measurements (carapace lengths (CL)) are aggregated then compared to other time periods to determine age and growth.

Each graph tells a story; in the example below (Figure 18), there are many age one shrimp, then a few age two and three. While a single graph is like a snapshot, comparing changes in these graphs over time tells a story. The horizontal (X) axis of these graphs indicates the size of the shrimp (larger as you move to the right); the vertical (Y) axis shows the relative amount of each size group (not total abundance). The "lumps" of these graphs are caused by the central tendency of each age group; thus changes to relative amounts of age classes can be tracked along multiple graphs. Arrows track year classes and indicate rate of growth as time goes on. These graphs look a little complex at first, but once understood, it becomes easy to visualize (Figure 19).

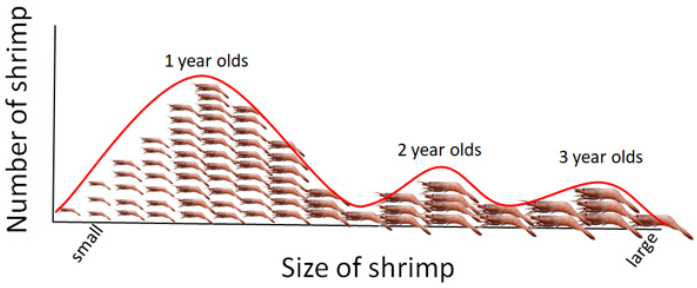


Figure 18. Hypothetical multi-modal size distribution of pink shrimp.

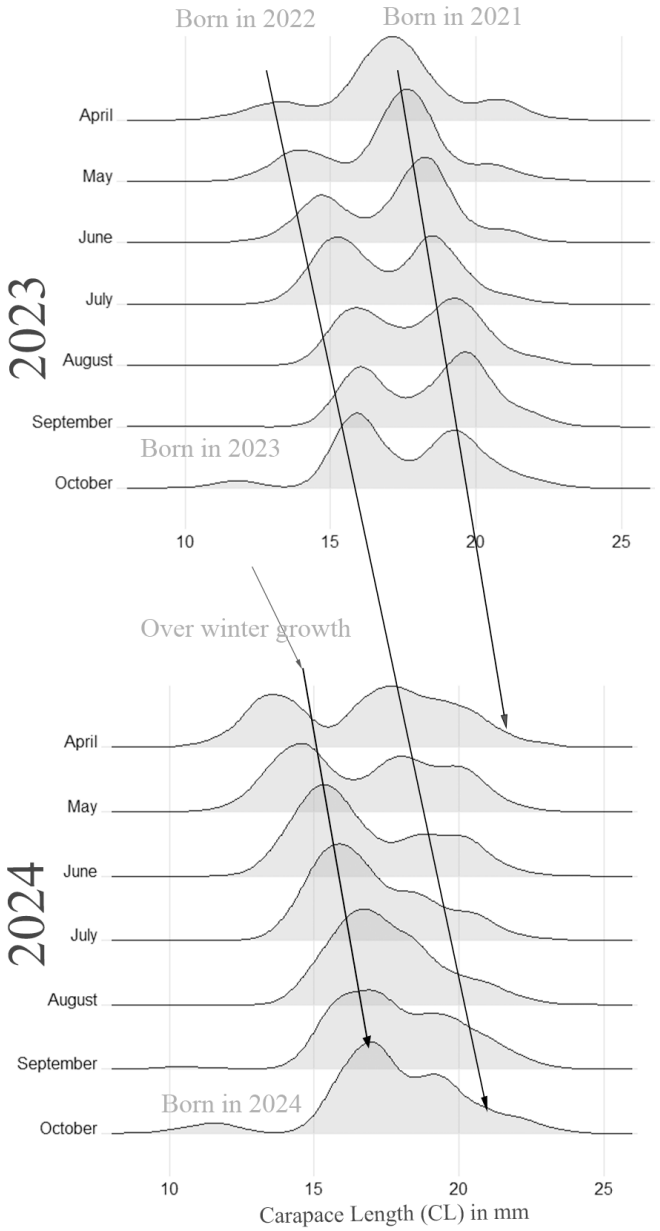


Figure 19. Pink shrimp size distributions by month (2023 and 2024) from Oregon landings.

Sampling doesn't always end at the docks!

Left:
Oregon shrimp in Pikes Place, Seattle.

Right:
Cold water prawns in Iceland.

Research Priorities

Here, we address three research areas in priority order: 1) shrimp population dynamics, 2) non-target catch, and 3) ecosystem effects.

Priority 1: Shrimp Population Dynamics

Our documentation and analysis of pink shrimp population dynamics is the highest priority of our program. Understanding changes in the shrimp population and comparing it to past populations, environmental data and other factors is critical to our ability to detect and address overfishing. ODFW's pink shrimp program has a thorough, long-term dataset of shrimp populations, which is central to our ability to assure it is fished sustainably.

2024 Analysis:
Every other year we examine the tenability of our recruitment model. In 2024, we examined the model which compares environmental conditions and spawner levels upon recruitment of shrimp to determine the interactions. Specifically, we look to determine if the fishery affects recruitment. In our past analysis, we've determined that environmental conditions drive recruitment, not fishing effort (Groth, 2022).

The 2024 analysis corroborated past findings, using data from 1979-2021, available here. A particular area of concern related to the model has been the increase in dependence of spawning stock, for recruitment, in the southern portion of stock. While we do see and expect some dependency on stock levels to recruitment, the changing conditions of the ocean itself is likely driving the deterioration of that element of the model. In historic analysis, the long dataset has been truncated to accommodate for significant changes to the fleet (i.e., the "modern fishery" in the past two decades has begun in 1979 when the fleet switched to higher production by introduction of mechanical peeling and double rigged vessels). We intend to work with new modeling techniques (e.g., General Linear Models) and may redefine "modern fishery" to include new and changing oceanographic conditions as well as improvements of fleet efficiency. We aim to have the next publication in this series review this carefully, for release in December of 2026.

For now, the model remains tenable. We expect this to change.

2024 Sampling:

We calculated annual indices on the number of shrimp using fish ticket, logbook and biological sample data. ODFW biologists entered data for 9,111 shrimp tows and measured 19,729 shrimp.

2024 Data advances:
We completed conversion of all biological sampling raw data to digital formats. Staff have worked all the way back to 1957, the entire history of the fishery! Our next step is to publish these data and have begun considering journals for availability and storage. The very long term and continuous dataset, 1957 to 2024, allows some unique analysis that we're excited about.

Priority 2: Non-Target Catch

Observer coverage:
2024 marked the last year for NMFS observers on US West Coast pink shrimp vessels, until the program gets reinstated. NMFS observer program provided valuable data on catch and bycatch since the early 2000s, and improved the fisheries sustainability. While the future is unclear, managers may try to find ways to work with the fleet to continue progress in sustainability around bycatch. In the near term, the regulations for the fishery developed with industry assure low bycatch in the current structure of the fishery, stock, and bycatch species.

Outreach:
ODFW worked with Oregon Museum of Science and Industry (OMSI) to develop outreach materials for a display on sustainable fishing. The materials were developed by youths interested in sustainability. We highly recommend you check out this exhibit, which is currently on display in Portland. The youth group involved was particularly spirited and we all take great pride in the collaborations which have improved the sustainability of Oregon's shrimp fishery.

Eulachon:
ODFW shrimp managers participate in quarterly meetings with Eulachon Technical Recovery and Implementation Team (ETRIT) working groups focused on status and biology and marine factors to understand the research and recovery efforts for the southern Distinct Population Segment (DPS).

We also provided bycatch information to the group and have spearheaded bycatch reduction research and developed tools that have been applied by other agencies to minimize eulachon bycatch.

Priority 3: Ecosystem Effects

Bridging Priority 2 and 3, ODFW staff (Dr. Leif Rasmuson) provided ETRIT a presentation on the relationship of shrimp fishing, eulachon presence, oceanographic variables, and physical habitats.

Dr. Rasmuson is leading ODFW staff to publish findings. The work combines shrimp datasets from ODFW, NOAA oceanographic data, and NMFS observer data to improve the sustainability of pink shrimp into the future.

Testing model performance

Introduction:
Periodically evaluating the effects of fishing and the environment on fishery stocks is critical to assuring its sustainability. Oregon's pink shrimp fishery is managed as a sustainable fishery and was the first shrimp fishery certified as "sustainable" by the Marine Stewardship Council (MSC).
In accordance with MSC recommendations, the Oregon Department of Fish and Wildlife (ODFW) published reports in 2014, 2016, 2018, 2020, and 2022 evaluating recruitment effects for ocean shrimp, for the purpose of documenting ongoing monitoring and analysis (Hannah and Jones 2014, 2016; Groth and Hannah 2018; Groth 2022). Here, we make those same analyses with the most recent three years of data. These long-term datasets and analyses provide metrics that allow us to have confidence in the sustainability of Oregon's pink shrimp stock in relation to fishing pressure.

The mathematical model (Figure 17) elegantly describes the relationship between environmental conditions and shrimp recruitment. The analysis described here tests the continued validity of that model.

The question is: "What is the most critical driver of shrimp recruitment, number of parents or environmental conditions?"

Methods:
To understand the effects of fishing compared to environmental conditions on the recruitment of pink shrimp, we employed multiple regression. The methods used are described in several preceding publications (Hannah and Jones 2014, 2016; Groth and Hannah 2018; Groth 2022).

Briefly, the methods compare environmental factors (sea level height during larval period and upwelling) to an index of spawning stock levels. Environmental factor data are available through NOAA data sets. Recruitment and spawner indices were developed from Virtual Population Analysis (VPA) and included only the shrimp caught and delivered in Oregon. Indices were then stratified by latitudinal zone (separated at Heceta Head, OR).

To determine the factors affecting the recruitment of pink shrimp, we use the above described variables, chosen from the best performing models found in past publications.

Data used in these analyses can be found on the pink shrimp news and publications site:
www.dfw.state.or.us/mrp/shellfish/commercial/shrimp/news_publications.asp

Essentially, we compare environmental conditions and spawner abundances to the consequent amount of shrimp recruitment, for each year.

Results:
In both the north and south areas, multiple regression models which considered both environmental conditions and the number of spawners were strong (r^2= 0.42 north, and 0.47 south, Table 1).

In northern areas, environmental conditions were the principal driver of recruitment, while spawners did not contribute to recruitment significantly (p= 0.21, model 1 in Table 1).

In southern areas, environmental conditions have historically been the principal driver of recruitment, although spawners have often been a statistically significant contributor. Serial autocorrelation (between spawners and environment) likely influences the statistical relationship between spawners and recruits (as described in Hannah and Jones, 2016).

Table 1: Multiple regression results from north and south pink shrimp recruitment indices, Oregon index areas 1982-2021.

	parameter/ variable	coefficients	standard error	R^2	P>F
Model 1: Log north recruit index	intercept	52.6458	8.741		0.000
	Log spawner index (t-2)	0.1595	0.1257		0.213
	April-Jan SLH (t-1)	-4.8187	1.0625		0.000
				0.4194	
Model 2: Log south recruit index	intercept	37.8732	8.4242		0.000
	Log spawner index (t-2)	0.4532	0.1248		0.001
	April-Jan SLH (t-1)	-3.5013	1.0285		0.002
	April-July Upwelling at 42° N, 125° W	-0.0035	0.0030		0.2527
				0.4673	

Discussion:
The 40 years of data in the model continue to show that environmental conditions remain the key driver of shrimp recruitment, while the number of parents has a small role (Table 1, model 2). In this way, restraining fishing would have little effect on shrimp recruitment when compared to a good larval environment (e.g. La Niña), however must be considered when larval environments are poor (e.g. El Niño). However, when stocks are particularly low, our fishery management plan specifies limits related to environmental conditions and fishing metrics which does restrain the fishery at times of low shrimp abundances. Our next steps include 1) thorough re-evaluation of the model (2026), and 2) development of new metrics for targets in Fishery Management Plan (FMP) update (2028).

Regulation Info

Key regulations that apply to **Oregon** pink shrimp deliveries				
		Fishing off CA*	Fishing off OR**	Fishing off WA***
Areas	0-3 miles	No fishing	OR permit needed	No fishing
	3-200 miles Key closed areas	Delgada Canyon, Tolo Bank, other closed areas (see CA regs)	Nehalem Bank, Daisy Bank, Stonewall Bank, Heceta Bank, Coquille Bank	Grays Canyon (see WA regs)
Mesh size		Minimum 1-3/8"	No minimum	
BRD		≤ ¾" spaced rigid grate		
LEDs		5 LEDs in central 16 feet of each net, spaced 4 feet apart (More LEDs may be used)		
Count per pound		≤160 shrimp/ pound		
VMS declaration		Required		
Season		April 1- October 31		

*CA Regulation details: CA Fishery Management Plan
**OR Regulation details: https://www.dfw.state.or.us/OARs/index.asp
***WA Regulation details: https://wdfw.wa.gov/fishing/commercial/shrimp#
**** NMFS groundfish limits

Enforcement update

In 2024, Oregon State Police (OSP) spent 93 hours working on Oregon's pink shrimp fishery. In total, 57 contacts were made, 3 citations were issued, and one warning was issued. For the first time in known history, OSP boarded a shrimp vessel and inspected it (all was good!). Staff and fleet alike appreciate these new capabilities for OSP.

In policy, ORS 506.720 was amended to clearly describe the penalty for count per pound violations to include load forfeiture. While this had been an understanding for years, this amendment makes it clear. Keep it under 160 boys!

OSP boarding a pink shrimp vessel in 2024

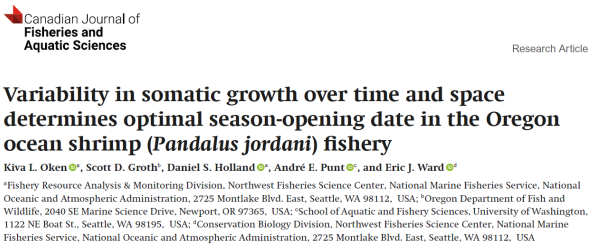
Fresh, legal Oregon pink shrimp

Other Topics

Bio-economic Analysis

ODFW collaborated with NOAA and University of Washington staff to evaluate the bio-economics of the US West Coast pink shrimp fishery. We used 1) growth data from three decades of dockside biological samples, provided by industry, 2) oceanographic data from NOAA stations, and 3) the keen mathematical mind of Dr. Kiva Oken who applied analysis to understand the relationship between the biology of shrimp and how the fishery may maximize its economic value.

Briefly, the manuscript finds that season delays may be particularly valuable in years with smaller shrimp and higher fishing mortality. The complexity of season delays is acknowledged; however, the simplicity of a broad change could increase the value of the industry.



Canadian Journal of Fisheries and Aquatic Sciences

Research Article

Variability in somatic growth over time and space determines optimal season-opening date in the Oregon ocean shrimp (*Pandalus jordani*) fishery

Kiva L. Oken, Scott D. Groth, Daniel S. Holland, André E. Punt, and Eric J. Ward

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Youth leadership!

Mentioned on page 9 (non-target catch) ODFW collaborated with Oregon Museum of Science and Industry (OMSI) to develop outreach materials for a display on sustainable fishing. The materials were developed by eight female and gender-expansive teens aged 16-19. They reached out to industry professionals to create outreach materials that are palatable to a wider audience. The group involved was particularly spirited and we take great pride in this particular collaboration, appreciating their insights and priority to sustainability.

We highly recommend you check out this "sustainable fishing" exhibit, which opened in spring of 2024 and is currently on display at OMSI in Portland.

If you can't make it to OMSI soon, its certainly worth checking out the videos, available here.

https://omsi.edu/articles/sustainable-fishing/

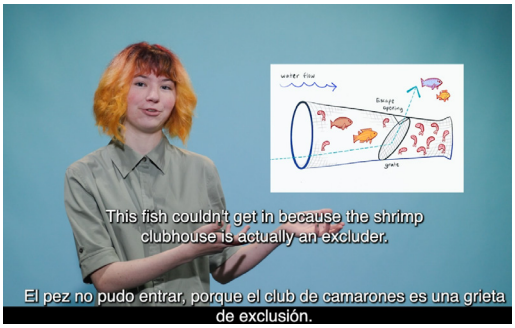
Aside from being informative, this outreach effort is particularly uplifting. It is great to see this perspective which acknowledges the hard work and cooperation of managers and industry.

Body Condition Index

ODFW staff submitted a manuscript for publication to the Canadian Journal of Fisheries and Aquatic Sciences regarding Body Condition Index (BCI). The paper is currently under review and should be in print in the next year (fingers crossed).

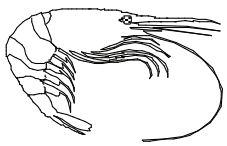
The manuscript describes how dockside biological samples provided by industry may predict shrimp abundance better than any other current metric, including fishery CPUE. If this work is accepted and science is reliable, BCI could be used at the beginning of the season to understand the approximate volume available in a way that is far better than any other current metric. Understanding abundance prior to the season has key value for industry, but also to understand when conservation measures are needed to ensure stock sustainability.

The methodology is accurate, simple, and durable which are good criteria to adoption into our upcoming 10 year review of Oregon's pink shrimp fishery management plan.



Screenshots from OMSI's sustainable fishing exhibit.

Good Luck
Shrimping in 2025!



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