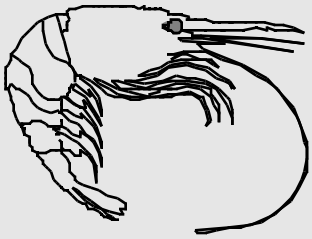
Annual Pink Shrimp Review

Oregon Department of Fish and Wildlife
ODFW Marine Region, 2040 S.E. Marine Science Dr. Newport, OR 97365
(503) 867-4741



TO: **OREGON SHRIMP INDUSTRY**
FROM: **Bob Hannah and Steve Jones**
Subject: **Opening of 1996 Commercial Fishery**
Date: **10 March 1996**

The 1996 pink shrimp season begins April 1 and lasts through October. After three consecutive years of below average and declining landings, we're all hoping for a good influx of one year old shrimp this year. This newsletter includes a summary of the 1995 season for your review, including catch, effort, and market sample information. Updates on some of our recent research and upcoming projects are also included.

1995 Season Summary

The season got off to a slow start due to price negotiations, with most vessels idle until April 12th. Approximately 12.1 million pounds of pink shrimp were landed into Oregon ports during the 1995 season. This was about 4.3 million pounds less than in 1994, and continued the string of below average annual landing totals we've had since 1992 (Figure 1). The decline over the last three years is due primarily to poor shrimp recruitment, probably resulting from unfavorable ocean conditions following larval release.

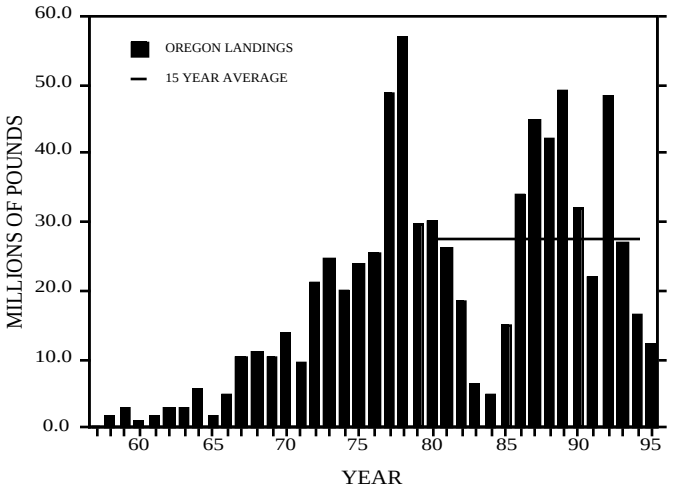


Figure 1. Oregon pink shrimp commercial catch (millions of pounds) 1957-1995. Includes all pink shrimp landed annually into Oregon ports.

Monthly catches were highest in April from all Oregon beds south of the Columbia River, with the largest monthly volume taken from the Bandon Bed (Figure 2). Coastwide monthly volume dropped off sharply during May and gradually declined to less than 0.4 million pounds during October (Figure 3), the lowest October landing total since 1983. However, this low total was strongly influenced by poor weather conditions and low fishing effort during October.

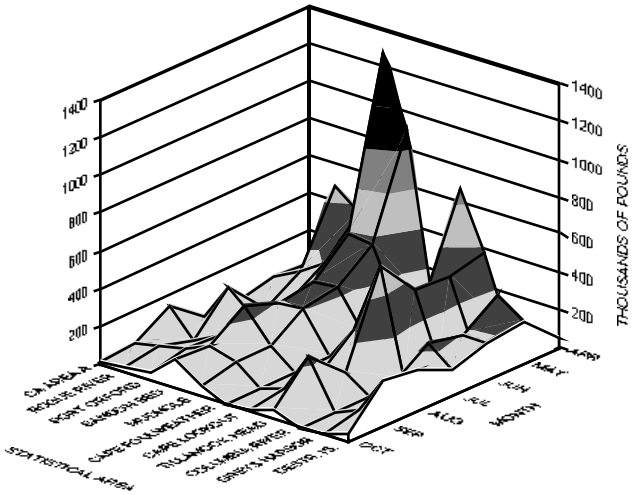


Figure 2. Total Oregon monthly catch (1000's of pounds) of pink shrimp (preliminary), 1995.

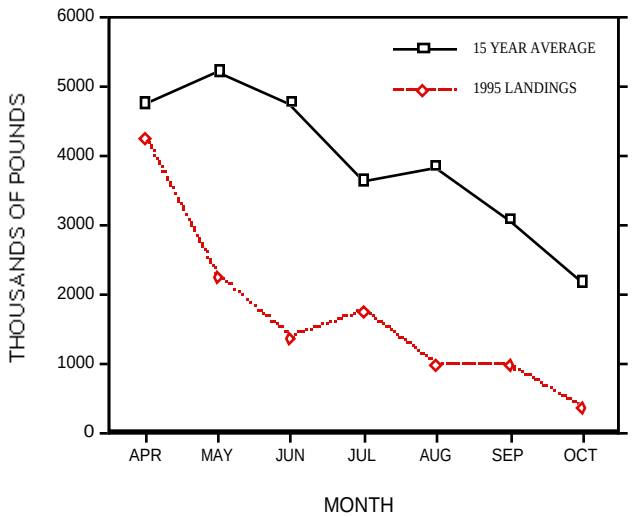


Figure 3. Monthly Oregon pink shrimp landings during 1995 and the 15 year average (1980-1994).

Shrimpers spent slightly less time fishing this year than last. Total single-rig equivalent (SRE) hours expended have been similar for the last three seasons (Figure 4). Fewer pounds landed and less time fishing meant that overall CPUE (single-rig equivalents) declined during 1995, and reached the lowest level since 1984 at 175 lb/hr (Figure 5). Monthly CPUE was highest during April, with relatively good catch rates in most areas except the Cape Foulweather bed (Figure 6). CPUE declined sharply in May coastwide, and remained fairly stable at a low level through the rest of the season in most areas. (Note: to convert CPUE in single-rig to double-rig equivalents, multiply times 1.6.)

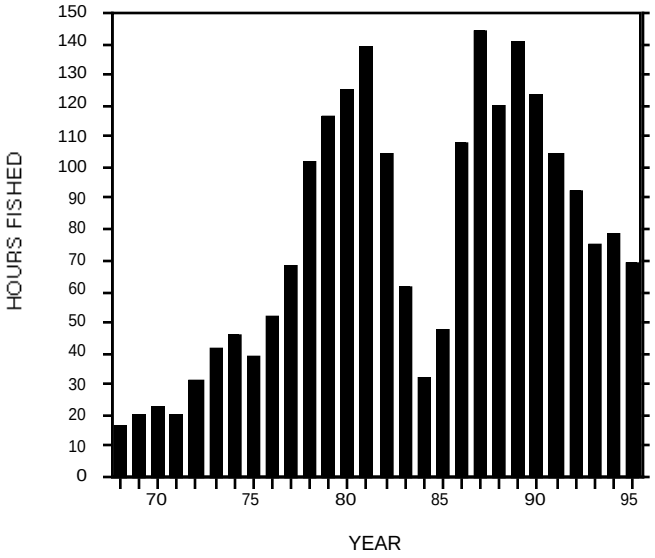


Figure 4. Fishing effort (single-rig equivalent hours) for pink shrimp landed into Oregon ports, 1968-1995.

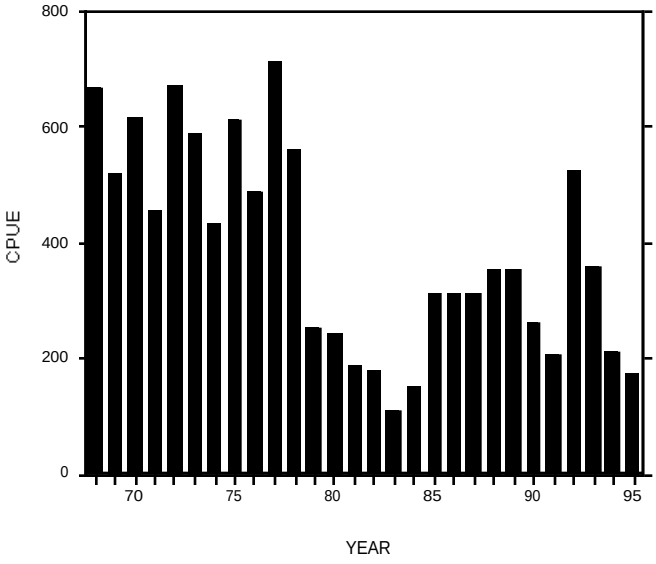


Figure 5. Catch per unit of effort (CPUE = lbs/SRE hour) for vessels landing pink shrimp into Oregon ports, 1968-1995.

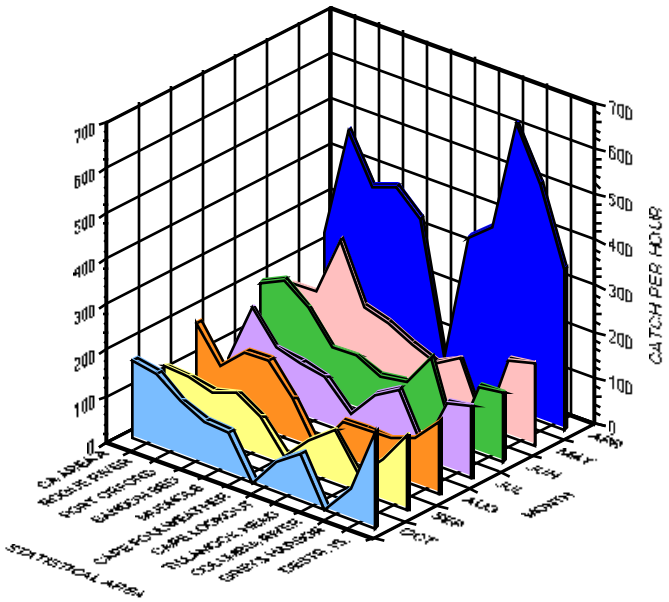


Figure 6. CPUE (preliminary) by area and month for the 1995 pink shrimp fishery.

Shrimp prices were relatively high this year, which enabled some shrimpers to keep fishing even at low CPUE. The opening price was about $0.65/lb for most of the coast and remained stable through May. The price increased to about $0.75/lb during June and July, then increased gradually to a high of $0.85/lb at the end of the season.

The average count per pound of shrimp landed in Oregon during 1995 was about 93 shrimp/lb, well below the 15 year average count of about 116 shrimp/lb (Figure 7). Our historical database shows that shrimp grew at record or near record rates during 1995, contributing to the low count. Also, such a low average count indicates that one year old shrimp didn't dominate the catch in 1995, which is verified by percent age composition data from our market sample collections (Figure 8). In fact, all age groups (except zero age) were caught in roughly equal numbers this year. It is the most evenly balanced age composition noted since this data series began in 1966. This unusual age composition is one result of having three consecutive weak year classes, and suggests that the 1995 crop of age one shrimp was very weak.

Indicators For 1996

So what's in store for the 1996 season? One thing is certain, we'll be heavily dependent on one year olds to supply our shrimp volume this year. Older shrimp originated from weak year classes to begin with, and have been harvested heavily, making large harvests of age 2 and 3 year olds unlikely. The strength of the incoming year-class of age one shrimp is unknown.

Our recruitment model, which is still preliminary (Figure 9), suggests that production from the incoming year class should be about average. However, as you can see from the graph, "average" covers a very wide range of recruitment. For example, the 1994 sea level data suggested a slightly better than average recruitment for 1995. However, catch, CPUE and age composition data shows that this year-class actually came in well below average. The sea level of about 7.2 ft. recorded in April 1995 suggests 1996 recruitment will fall somewhere between about 1.0 to 3.5 billion recruits, an average recruitment at best. It should be noted though that there's a lot of wiggle room between these two numbers.

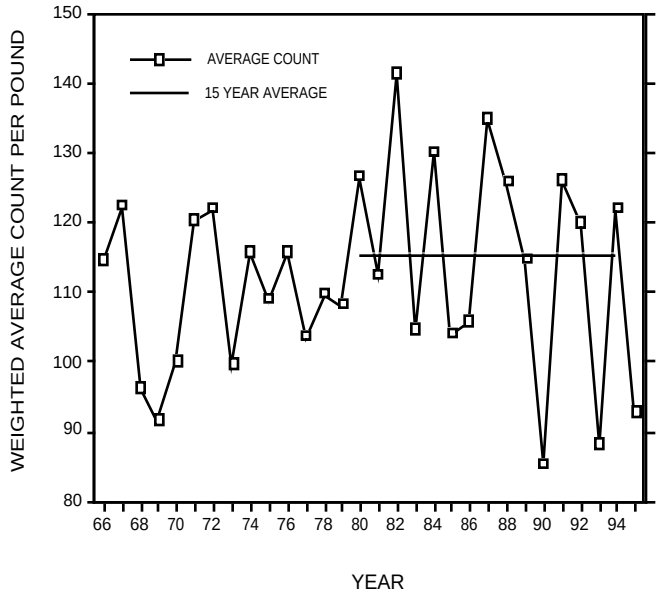


Figure 7. Average (catch weighted) count per pound of pink shrimp landed in Oregon, 1966-1995.

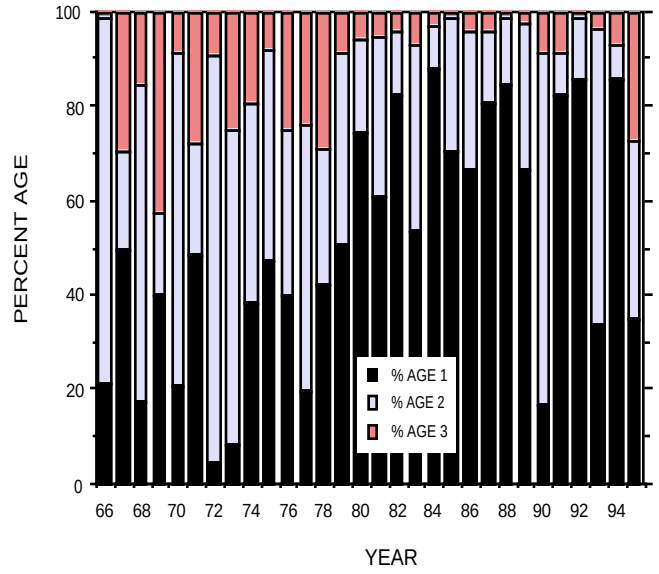


Figure 8. Annual percent age composition of pink shrimp (numbers of shrimp) landed in Oregon, 1966-1995.

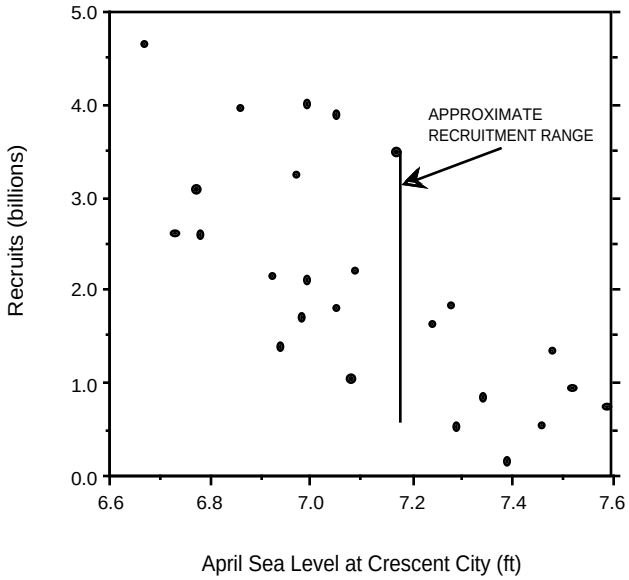


Figure 9. Shrimp recruitment versus sea level in April of the larval year. High sea level indicates a weak or late spring transition during early larval development.

Zero-age shrimp were widespread during September and October 1995, but their true abundance is hard to assess. Shrimpers reported their presence in many locations from Brookings to Cape Flattery, but effort was so low that large areas weren't covered. Our market samples during these months were also patchy. The samples collected had about 1% zero's at best, not much different than samples collected during Fall 1994. Like last year, we have conflicting evidence over the strength of the incoming year-class, with none of the evidence pointing clearly to a big year-class or a failed year-class.

Changes in Limited Entry System

House Bill 3444, passed by the 1995 Oregon Legislature, includes a number of changes regarding the Oregon pink shrimp limited entry system. We encourage all permit holders to familiarize themselves with the changes described in the bill, particularly aspects pertaining to transferability and renewal requirements. The bill is available for review at ODFW offices in Newport, Charleston and Astoria, or copies may be obtained by writing your local legislator. Some changes that may be of general interest include;

1) Single delivery licenses for pink shrimp may only be obtained by individuals holding valid commercial fishing permits to take pink shrimp in the states of California or Washington, not any other state.

2) A shrimp permit lottery will not be held until the number of permits drops below 150 instead of 187.

3) A permit acquired through waiver of eligibility

requirements may not be transfered until the vessel for which the permit was issued has been used in the shrimp fishery for three or more consecutive years to land at least 5,000lb of pink shrimp.

A Word About Count per Pound

If recruitment improves in 1996, the potential exists for some higher average counts than in 1995. The Oregon State Police will be actively monitoring count again this year. For anyone who is unsure about which types of scales work best at sea, or how much the average weight of retained shrimp is likely to change, we have two reports available which detail our research in these areas. Just call us for copies, or for any other questions about count per pound. The best way to protect yourself is to get a good scale and monitor your counts frequently. It also helps to leave yourself a little room for error by not "pushing the line". If you do accidentally get into some small shrimp, remember that loads under 3,000 lbs are exempt from the 160 count limit. It might be better to run to port with a small load and try again, rather than have the load confiscated.

Research

Finfish Excluder Study

We completed field tests of four finfish excluders during 1995 and our final report on this research project is nearly complete. The 18 month study was funded by a NOAA Saltonsal/Kennedy (SK) grant. We tested three soft mesh panel excluders ("WeJo's") in 3", 5" and 8" mesh versions, and the Nordmore grate with one inch bar spacing. The field trials were conducted under actual fishing conditions. We chartered three Oregon shrimp vessels for the study; the F/V's Ginger B, Lady Kaye and Prospector. We want to thank the owners and crews of these vessels for their cooperation and expertise in what we feel was a very revealing study of the devices.

We found that all the devices tested were effective at excluding fish, reducing the catch of fish from 55% to 90%, by weight (Figure 10). However, the 3 inch mesh device and Nordmore grate were clearly more effective at excluding adult and juvenile hake, generally the most abundant bycatch species. As expected, large fish (> 30 cm) were excluded more effectively than small ones, although all of the excluders reduced the catch of small fish significantly. The very abundant age 2 year class of Pacific hake will be moving up into the 30-35 cm size class this year. Working properly, a 3 inch mesh excluder could be a very handy tool to have on board in 1996. An example of what an effective excluder can do is shown in Figure 11.

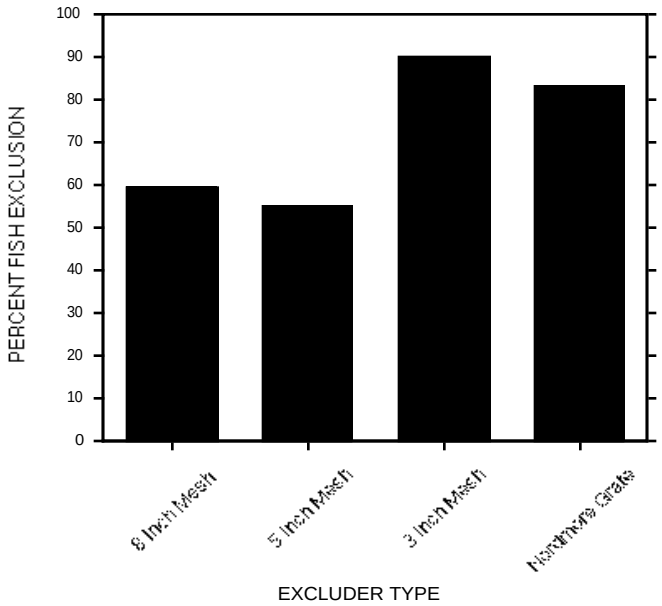


Figure 10. The total percentage of fish (by weight) excluded by four excluder styles tested in the Oregon pink shrimp fishery in 1995.

Figure 11. A view into the divided shrimp hopper on the F/V Ginger B. No excluder was in use on the left side; an excluder was used on the right side.

We all know there's no such thing as a free lunch, and this old adage is true for fish excluders as well. All of the devices we tested caused some shrimp loss, and the level of loss was highly variable (Table 1). The high variability we observed generally confirmed the widely varying reports we were getting from fishermen; some love their excluders and some had to simply remove them or risk going broke. The shrimp loss we measured ranged from an increase on the

excluder side (probably just due to chance) to as high as 31% loss. The average was around 8%. It's clear to us that some more research on excluders is needed to make them a more reliable tool for fishermen. We're planning to submit a new SK research proposal this spring to further research these devices.

Table 1. The percentage of shrimp loss (by weight) of four excluder styles tested in the Oregon shrimp fishery during 1995.

EXCLUDER	Jul '93	Jun '95	Jul '95	Sep '95
8 Inch Mesh	5.7%	Increase	31.4%	
5 Inch Mesh		7.0%	15.5%	
3 Inch Mesh				6.6%
Nordmore Grate		9.7%	Increase	Increase

We do have some ideas on factors which influence shrimp loss which we'd like to pass along. If you install an excluder and are experiencing high shrimp loss try the following adjustments.

1) Increase the angle of the excluder; when these devices are hung at an angle smaller than 45° to the horizontal shrimp loss increases.

2) Reduce the size of the escape port; this may reduce fish exclusion efficiency some but it definitely improves shrimp retention.

3) Try using an escape port that is simply a slit in the net oriented parallel to the long axis of the net. The drag on the net from the catch doesn't tend to widen the escape port when it is oriented this way.

4) Move the escape port forward a few meshes; fish will still see it and exit but the small "lip" at the top of the excluder panel may help retain shrimp.

In the next phase of our excluder research, we hope to gather some quantitative information on how these types of modifications influence excluder performance. For anyone wanting more detail on our 1995 excluder research, copies of our draft report should be available upon request soon. We also have a video presentation summarizing our 1995 work. The video includes footage such as Figure 12, which shows an 8" mesh WeJo excluder with a rockfish working its way up the excluder panel towards the escape port. Loaner copies of the video will also be available at our coastal field offices soon. We encourage shrimp fishermen and other interested parties to review our findings, and to keep using these devices.

Figure 12. A view of the 8" Wejo excluder panel in action. Note that the meshes are well spread laterally and horizontally. Improper hanging of an excluder panel can result in too much tension in one direction, decreasing fish exclusion efficiency and increasing shrimp loss.

Upcoming Projects

Our new underwater video system is nearly complete, and we plan to put it to good use this year. We'd like to investigate shrimp mortality associated with passing through codend mesh. Specifically, to find out at what stage in a tow most small shrimp are passed through a large mesh codend; while the net is on the bottom, during haulback or at the surface? Are shrimp noticeably damaged during pass-through, thus potentially increasing mortality? Answers to these questions may shed new light on the utility of mesh size as a management tool in the pink shrimp fishery. A little background is in order here. Codend mesh size comes up in conversation fairly frequently when discussing shrimp management. Worldwide, it's a common management tool, including the state of California. With California, Oregon and Washington all fishing on a common resource, there's always pressure for regulatory consistency. Here in Oregon, we believe that managing small shrimp harvest is best accomplished with a count per pound regulation. It allows maximum flexibility to industry and adequately protects small shrimp. We feel that there are many logistical problems with managing by mesh size, and that there is anecdotal evidence suggesting that shrimp passing through meshes may not survive. If mortality is high for escaping shrimp, it defeats the purpose of regulating by mesh size. If we can, we'd like to shed more light on the issue of pass-through mortality.

With hake abundance up on the shrimp grounds during the last few years, fishermen have been asking

how much shrimp they eat and how this might affect both shrimp recruitment and yield. Shrimp are definitely a component of their diet, and considering the large biomass of hake present, their impacts on the shrimp population may be large. In an effort to better define the degree of hake predation on shrimp, we are currently analysing the contents of hake stomachs (both juvenile and adult) collected during our fish excluder research. This years work won't be definitive by any means, but will provide some recent data on the degree of shrimp predation by hake and the age at which they begin eating them. We hope to continue this analysis next year. Look for our preliminary results in our next newsletter.

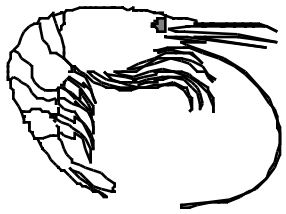
Reports Available

Some of our recent research concerning pink shrimp population dynamics has been published within the last year. Copies are available to interested individuals and are listed below. Much of this work is based directly on quality logbook and landing data supplied by the fleet.

Hannah, R.W. 1995. Variation in geographic stock area, catchability, and natural mortality of ocean shrimp (*Pandalus jordani*): some new evidence for a trophic interaction with Pacific hake (*Merluccius productus*). Can. J. Fish. Aquat. Sci. 52: 1018-1029.

Hannah, R.W., S.A. Jones and M.R. Long. 1995. Fecundity of the ocean shrimp (*Pandalus jordani*). Can. J. Fish. Aquat. Sci. 52: 2098-2107.

Good luck shrimping in 1996!



Oregon Department of Fish and Wildlife
Marine Region
2040 SE Marine Science Dr.
Newport, OR 97365-5294


MAY 30 1995