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MEMO

TO: OREGON SHRIMP INDUSTRY

FROM: BOB HANNAH, PINK SHRIMP PROJECT LEADER

SUBJECT: OPENING OF 1991 COMMERCIAL FISHERY FOR PINK SHRIMP

DATE: MARCH 15, 1991

The 1991 commercial pink shrimp season opens April first and runs through the end of October. As the opening approaches, we wanted to contact the members of the shrimp industry and review both the 1990 season and what we believe is in store for the fishery in 1991. The data summaries presented here are derived from market samples we collect at the docks, from landing tickets supplied by processors, and from logbook data supplied to us by fishermen.

Pink shrimp catch in 1990 totalled 31.9 million lb, 17.2 million lb less than 1989 but still well above the ten year average of 26.8 million lb. The highest catch rates (Figure 1) occurred on the south coast and off of Washington early in the season. Catch rates declined rapidly coastwide as the season progressed. The largest total monthly catches (Figure 2) occurred early in the season off of the central Oregon coast and off Washington. Relatively high total monthly catches persisted through June after which catch fell off for the remainder of the season. The rapid decline in catch and catch rates is attributable to the extremely weak age one recruitment in 1990.

Accordingly, the age composition of the pink shrimp catch in 1990 (Figure 3) showed a much lower percentage of age one shrimp than in 1989. Age one shrimp comprised nearly 70% of the catch in 1989, and exceeded 70% in 1987 and 1988. By contrast, age one shrimp in 1990 exceeded 50% of the catch only once, during August off Tillamook head. Generally, the largest percentages of age one shrimp observed ranged from 40-45% of the catch. The low average count per pound (Figure 4) reflected the dominance of age 2 and older shrimp. Counts were well below 100 shrimp per pound in most areas and months, and somewhat above this level early in the season in areas 30 and 32. Overall, the grade of shrimp landed in 1990 was uniformly excellent.

Zero age shrimp were observed in seven of the eleven state statistical areas in October of 1990. In 1989, age zero shrimp were encountered in only one of ten areas sampled in October. The lack of age zero shrimp in 1989 appears to have correctly indicated low age one recruitment in 1990. The higher levels of age zero shrimp in October of 1990 may indicate a rebound in recruitment of age one shrimp in 1991. Zero age shrimp collected in fall 1990 appeared to be somewhat smaller in size than zero age shrimp in recent years.

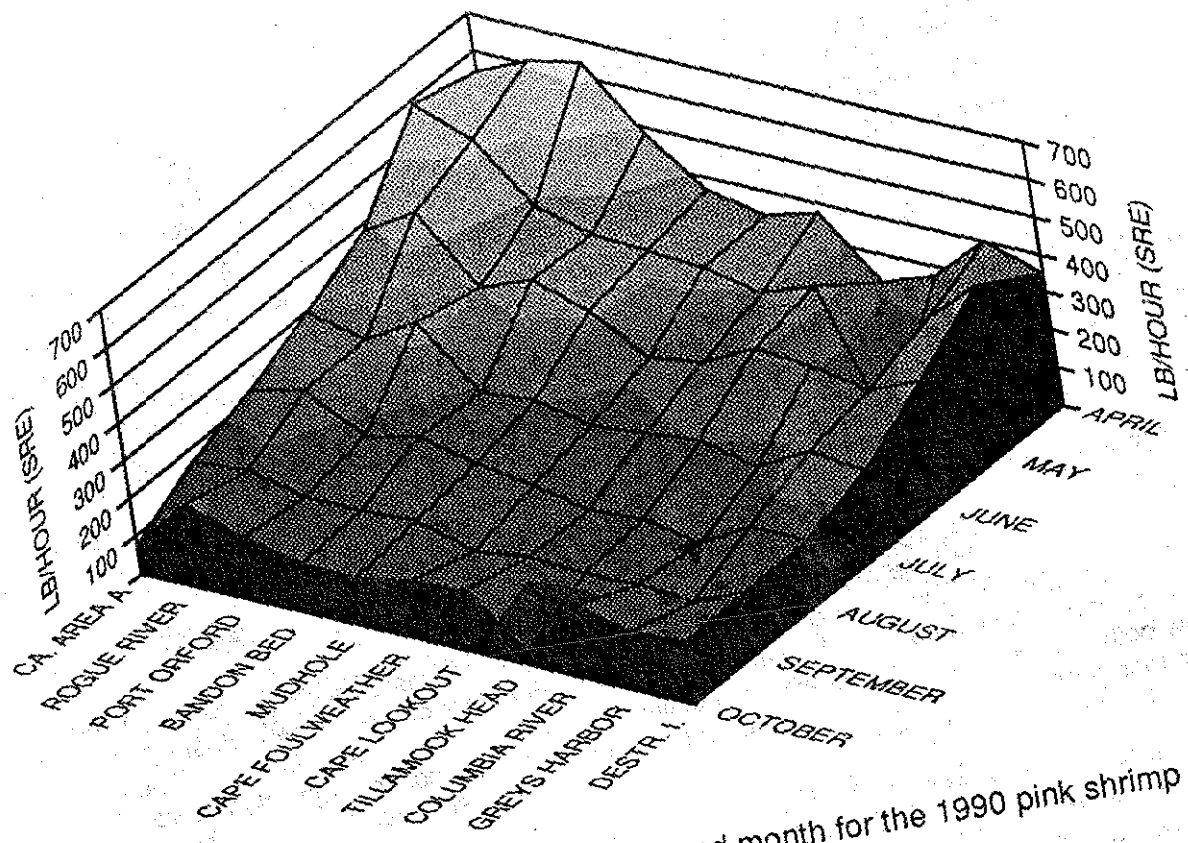

Figure 1. Catch per unit effort (preliminary) by area and month for the 1990 pink shrimp fishery.

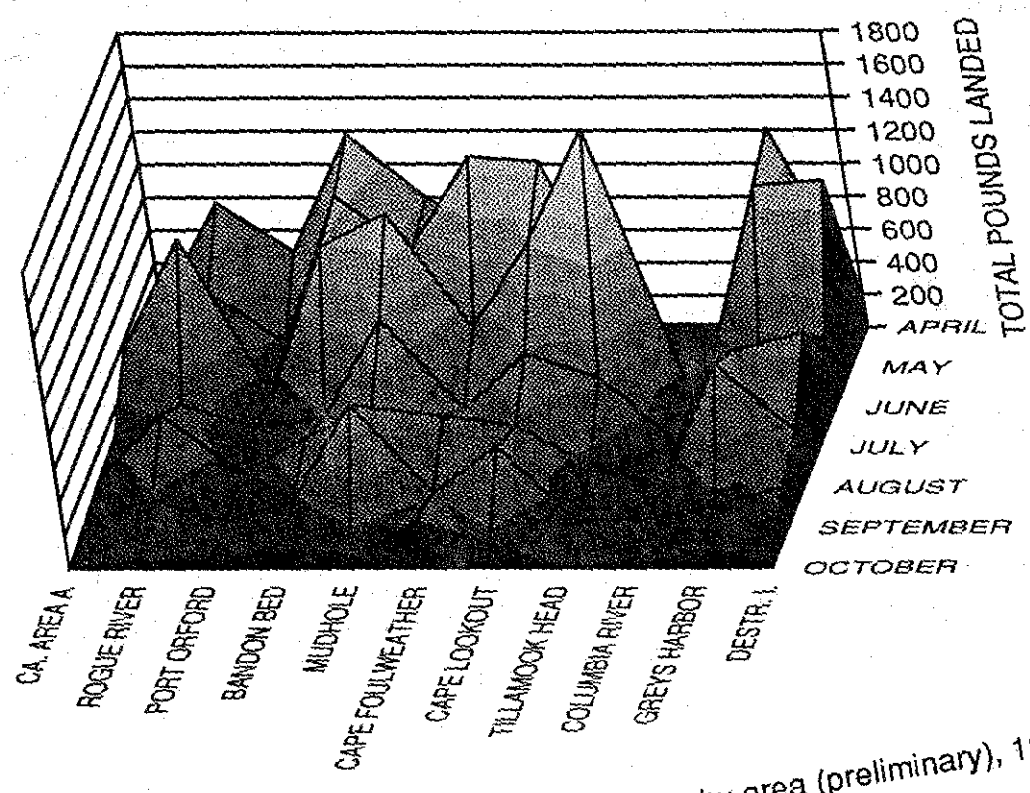

Figure 2. Total monthly catch of pink shrimp by area (preliminary), 1990.

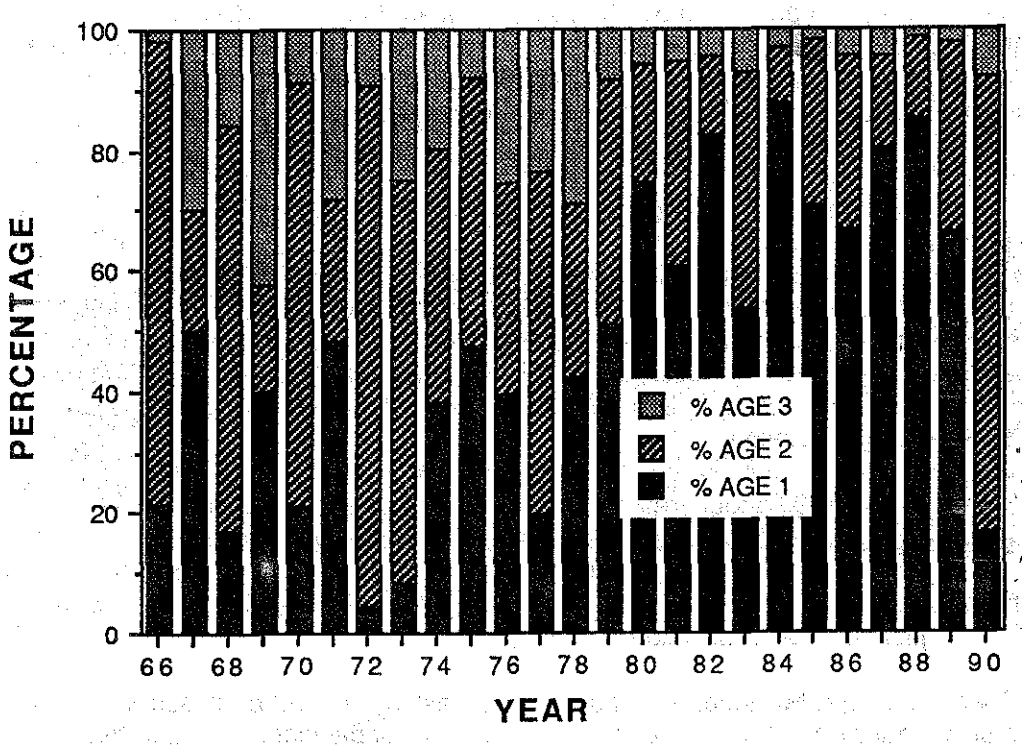

Figure 3. Age composition (preliminary) of Oregon pink shrimp, 1966-1990.

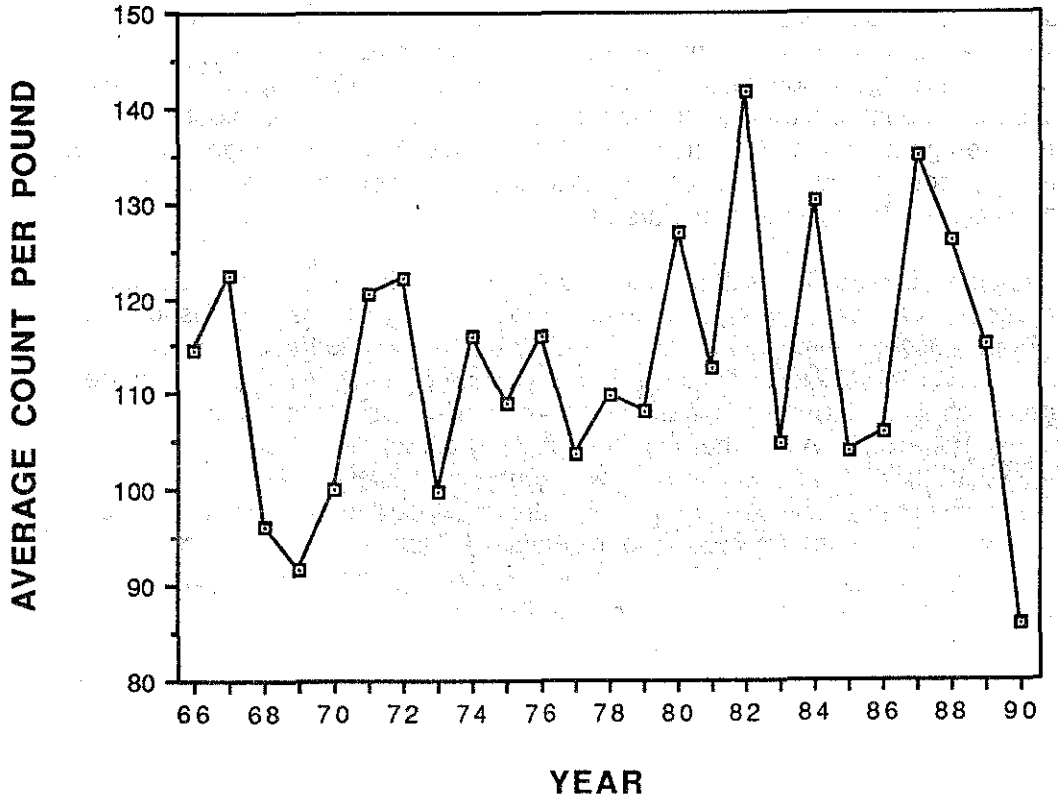

Figure 4. Average (catch weighted) count per pound of Oregon pink shrimp, 1966-1990.

When age zero shrimp are small and when overall catch rates are low, as in 1990, age zero shrimp are caught less efficiently by standard shrimp trawl gear. Even when age zero shrimp are large they are incompletely recruited to trawl gear. Consequently the catch of age zero shrimp in the fall is only a very crude indicator of age one recruitment the following spring.

The sex composition of pink shrimp in the fall of 1990 was characterized by very low levels of primary females (age one shrimp which are females) especially when compared to recent years. Pink shrimp are protandric hermaphrodites (usually breed first as males and then as females the following year) and seem to be capable of either accelerating or delaying sex change in response to the ratio of older breeders to first time breeders. This ratio is strongly influenced by fluctuations in recruitment. The low level of age one shrimp in 1990 resulted in a relative excess of age 2 and older shrimp. As a result, most age one shrimp and even some age 2 shrimp failed to transition into females in 1990, resulting in a sexually balanced breeding stock despite an unusual age structure in the population.

The lack of age one shrimp in 1990 should result in a relative lack of age two shrimp in 1991. With the age two shrimp population depressed, if age one shrimp show up in average abundance, we will see higher average counts than in the last three years. Our primary in-season management tool, the 160 minimum count per pound (ct/lb) regulation, is designed to protect age 1 shrimp in just this type of situation.

In 1988 and 1989 we completed two studies that should help fishermen and processors comply with the minimum size regulation. The first study tested a number of balances at-sea to better understand the process of obtaining estimates of ct/lb under actual fishing conditions. Our study showed that there are reasonably priced balances available that can measure ct/lb at-sea with an error as low as one half of one percent. A magnetically dampened triple beam balance worked best, but any triple beam balance readable to the nearest gram should work well. The second study was a thorough study of weight change in pink shrimp from initial capture to the time of landing, under actual hold conditions. This study showed that over a broad range of trip lengths, boat types, total catch levels and icing procedures mean shrimp weight declined, but not by a large amount. The average weight loss we recorded for a total of 713 samples was only 2.2%. This would be equivalent to a change in ct/lb from 160 to 163.6 shrimp per pound. The single highest daily average weight loss observed was 5.4%, equivalent to a change in ct/lb from 160 to 169.1 shrimp per pound. Our conclusion from this study is that during a normal shrimp trip ct/lb doesn't change very much after the shrimp are caught.

As a result of our studies ODFW believes that continuing to use a minimum average size limit of 160 whole shrimp per pound as our primary management tool makes good sense. Fishermen and processors currently decide when, where, and how to fish for shrimp to best respond to the changing market. However, most shrimp fisheries throughout the world are managed by more restrictive measures such as quotas in combination with mesh size restrictions and sometimes area closures. The management scheme here in Oregon really allows fishermen and processors maximum flexibility. The cornerstone of our management scheme is the effectiveness of the count per pound regulation. Broad industry support for this minimum size regulation is the best way that the industry can help maintain this "hands-off" approach to managing the pink shrimp fishery resource. For further information, or copies of the reports discussed above, contact us at the Newport office (503-867-4741).