



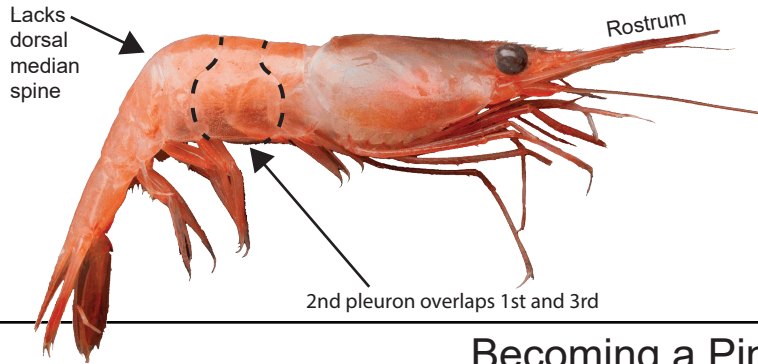
Pink Shrimp Life History

About Pink Shrimp

Pink shrimp *Pandalus jordani*

Pandalid shrimp have a long rostrum, and an overlapping 2nd pleuron.

Pink shrimp are also known as “ocean shrimp” or “smooth pink shrimp” the “smooth” refers to the lack of a dorsal median spine, when compared to the similar shrimp, *Pandalus borealis*, which is the target of North Atlantic fisheries.



A Brief Summary:

Pink shrimp live short lives (3 years or less), and populations vary depending on environmental conditions. They are found offshore in depths of 50-110 fathoms, on soft bottom habitats (mud and sand). Reproduction in shrimp is adapted to their short life history. Shrimp begin their lives as males, then transition to females depending on the sex ratio of the population. In some cases, shrimp will mature first as females to compensate for a lack of older, larger female shrimp.

Pink shrimp grow quickly in their first year, becoming of legal size (<160 count/lb) soon after their first year of life. Shrimp tend to grow faster in warmer waters (via raised metabolism) and in lower densities (via lower food competition).

Sustainability of the Pink Shrimp Fishery

The US West Coast Pink Shrimp Fisheries are managed sustainably, measured on 3 principals.

- The health of the stock:** Scientists work together with fishermen (e.g. employing the use of their logbooks and catch) to constantly monitor the shrimp population (population levels, growth, age, etc.). These data can then be compared to environmental and fishing data to understand which factors drive populations, assuring fishing does not threaten stock health.
- The impact of the fishery to the environment:** Successful collaboration has aided innovations in bycatch reduction (see reverse side) minimizing bycatch, while direct research on habitats have provided understanding of fishery effects to the soft bottom, dynamic environments where the fishery operates.
- The effective management of the fishery:** Management has been effective, by relying on the strong relationship between fishermen and scientists mutually interested in the progress and long term sustainability. Pink shrimp fishermen have led the way in adaptation and support of measures to reduce bycatch and improve sustainability.

Oregon's Pink Shrimp Fishery was the first shrimp fishery worldwide to be certified sustainable by the Marine Stewardship Council (MSC) in 2007. Washington's fishery was certified soon afterward and California's fishery operates on many of the same tenets.



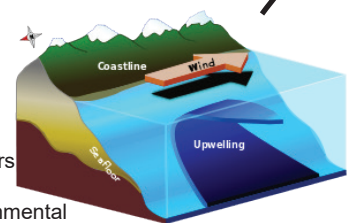
Becoming a Pink Shrimp

Pink shrimp recruitment is “environmentally forced” meaning that ocean conditions are the primary driver of annual recruitment. In many biological populations, spawners (the number of parents) primarily predict recruitment and predators limit populations. However, pink shrimp are different given the dynamic environment of the Northeast Pacific and their short, flexible life history. Pink shrimp depend on environmental conditions and consequently, stocks are extremely variable. Cold water La Niña conditions are better for pink shrimp recruitment than warm water, El Niño conditions.

Larvae molt 11 - 13 times in their first year. They are transported by currents and tend to stay in upper areas of the water column.

“Age 0” shrimp are first caught in the fishery in the fall. Since they grow faster in warm water, southern areas typically see them first.

Larvae are not strong swimmers and are at the whim of environmental conditions of spring. Good conditions during the larval period (early spring transition, optimal summer winds/currents) determine the fate of these larvae.



Summer

Fall

Age 0

Spring

Winter

Eggs are released into the water column in early spring. They transform into “zoea,” a microscopic baby shrimp. They eat plankton and grow quickly while being moved around by ocean currents.

Eggs are carried on their mother's abdomen for 5 months.

Each fall, females develop and store eggs in the head - called head roe.

Summer
Age 1 shrimp grow quickly, nearly doubling in size in 8 months.

Spring
Small shrimp or “pinheads” are avoided by the fleet.



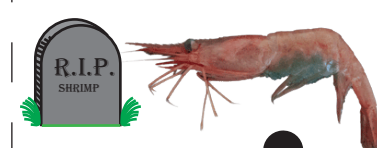
244 Count in April
Age 1
134 Count in October

Fall

Depending on the sex ratio of the population, some shrimp may become female in their first year of life.

Most shrimp mature first as male.
Age 1 female shrimp are less common, but are critical in some years.

First Winter



Spring

Age 3 females are large, but few shrimp live to this age, either harvested or expiring of old age.

Age 3
60 Count

Age 2
120 Count

Spring
Age 2 shrimp are the primary target of spring fishing.

Fall

Remaining male shrimp transition to female and carry eggs.

