Pink (Ocean) Shrimp, *Pandalus jordani*
Fishery Management Plan

Pink Shrimp, *Pandalus jordani*. Credit: R. Hibpshman

DRAFT

California Department of Fish and Wildlife

Marine Region

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Executive Summary

This fishery management plan (FMP) for pink shrimp (*Pandalus jordani*) establishes a harvest control rule (HCR) for the fishery, a requirement for the use of footrope lighting devices (FLDs) to aid in bycatch reduction, a procedure to standardized reporting of pink shrimp weight at the time of landing, and removes ambiguity about the legality of pink shrimp trawling in state waters. It is intended to meet the goals of a Basic FMP as described by the Marine Life Management Act (MLMA) Master Plan for Fisheries (CDFW 2018), providing a streamlined, cost-effective approach to implement FMPs for less-complex fisheries.

Pink shrimp support valuable commercial fisheries from California to Washington and range from southeast Alaska to Baja California but are only most abundant from Point Arguello to British Columbia (Hannah and Jones 2007). It is thought that a single genetic stock exists throughout their entire range (OST 2014).

Pink shrimp are most abundant off the coast of Oregon where the largest proportion of the fishery occurs. Pink shrimp are targeted via benthic trawl gear during the day when they are concentrated near the sea floor. In 2001, the California fishery was divided into northern and southern regions. Each region requires its own separate permit. Participation in the northern fishery (California-Oregon border to Point Conception) is restricted and requires a limited entry permit; the southern fishery (Point Conception to the California-Mexico border) also requires a permit but is open access.

Pink shrimp vessels deliver their catch to shore side processors (NWFSC 2010), where shrimp are usually shelled, cooked and frozen prior to sale as salad shrimp or cocktail shrimp (CDFG 2008). Currently, most of the pink shrimp catch is exported to Europe. European markets place a high value on Marine Sustainability Council (MSC) certification, prompting the Oregon fleet to obtain MSC certification in 2007. In 2015, both the Washington and California pink shrimp fisheries applied for MSC certification (MRAG Americas 2015). While Washington was approved, California was not due in part to a lack of an FMP with clear target and limit reference points. The California fishery has subsequently initiated a new round of consultation for MSC certification in 2021. A gap analysis conducted by MRAG Americas, the same certification body that certified the Washington fishery in 2015, found this FMP sufficiently addresses the shortfalls that prevented certification of the fishery in 2015 (MRAG Americas 2021; Appendix B).

In 2015, California, Oregon, and Washington fishermen harvested a record 103 million lb valued at $75.6 million. From 2016 through 2019, west coast landings

ranged from 52.9 million lb ($36 million) to 33 million lb ($17.2 million) while California landings ranged from 5.1 million lb ($3.7 million) to 2.5 million lb ($1.7 million). The majority of California landings occur in Crescent City (78%), followed by Eureka (16%) and Morro Bay (3%).

California's pink shrimp fishery is currently managed using a suite of static regulations to promote the sustainability of the target species. Although the fishery has regional permits and capacity goals, regulations are identical in both regions (14 California Code of Regulations (CCR) §120.1):

1. A seasonal closure from November 1 through March 31 to protect egg-bearing females.
2. A minimum trawl net mesh size of 1.38 in (36 mm) to allow for escapement of small 0- and 1-year old shrimp.
3. A prohibition on landing shrimp that exceed the maximum count-per-lb of 160. This is intended to limit the take of small 1-year old shrimp.
4. The required use of bycatch reduction devices (BRDs), including rigid grate excluders, soft panel excluders, and fisheye excluders.

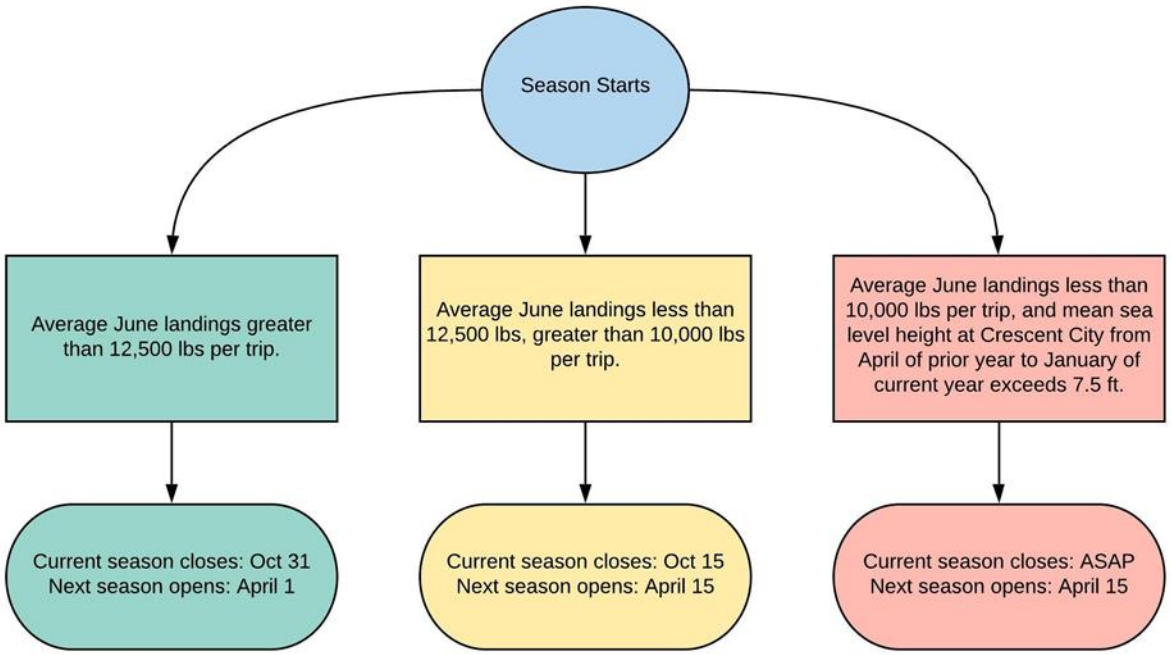
Management Strategy

This FMP implements an adaptive management framework for the commercial pink shrimp fishery utilizing catch reference points (June catch per trip) as a proxy for spawning stock biomass in a given year and an environmental indicator (sea level height) as a proxy for recruitment success (Figure E-1). The harvest control rule (HCR) is based on target and limit reference points developed by Oregon Department of Fish and Wildlife (ODFW) (MRAG Americas 2018; ODFW 2014c) and adopted by Washington Department of Fish and Wildlife (WDFW). Both states have incorporated these reference points into their pink shrimp FMPs (ODFW 2018b, WDFW 2017). Use of these reference points by California would ensure uniform coastwide management of this fishery.

The HCR establishes a 10,000 lb June catch per trip limit reference point to manage the fishery and a 12,500 lb target reference point to provide additional protection for the stock given the uncertain effects of climate change on the spawning dynamics of the stock (ODFW 2018b).

The HCR also incorporates sea level height (SLH) in Crescent City from April of the previous year to January of the current year, when larvae are typically present in the environment, in its limit reference point as a proxy for preseason stock status. April-January SLH of 7.5 ft or greater correlates with poor recruitment events. The limit reference point is triggered when this environmental condition is met and the June catch per trip is below 10,000 lb. In this case the

fishery is closed as soon as practical, and the opening of the next season is delayed until April 15. The target reference point is triggered when June catch per trip is below 12,500 lb regardless of environmental conditions and results in the season closing on October 15 and delays the start of the next season to April 15. Both measures are intended to provide added protection for egg bearing females and prevent the stock from falling below the lowest previously observed spawning stock biomass.



Note: The landings of single-rigged vessels are multiplied by 1.6 to compensate for the increased efficiency of double-rigged vessels.

Figure E-1. Flow chart of proposed harvest control rule for the California pink shrimp fishery.

The HCR relies on an accurate reporting of catch per trip, and so requires a consistent method of reporting landing weight. Fleet members and processors are concerned that deicing shrimp prior to weighing would cause product degradation, so the FMP proposed implementing regulations will require processors, in collaboration with the California Department of Fish and Wildlife (Department), to develop a procedure to estimate the percentage of ice in landings and report the net weight of shrimp landed. Oregon and Washington have established similar methods to compute net landing weights, and adoption of such a method in California would further standardize the management of the stock between the three states. This net weight is intended

to satisfy the accurate weight requirements of Fish and Game Code (FGC) Section 8043 and California Code of Regulations (CCR) Title 14 Section (§)197.

Bycatch reduction

Recent research by ODFW and Pacific States Marine Fisheries Commission (PSMFC) indicates that attaching inexpensive green LED lights on nets reduced eulachon catch by 90.5% and juvenile rockfish catch by 78%, with negligible impacts on shrimp retention (Hannah et al. 2015). These FLDs are an effective, low-cost solution to address eulachon bycatch and are currently being used voluntarily in California. Regulations requiring FLD use will be proposed in connection with this FMP.

Implementing this FMP will require the California Fish and Game Commission (Commission) to adopt HCR, FLD, and landing weight regulations, and the Department to work with processors to implement weighing procedures. Ongoing outreach and education about the new requirements with the fleet will continue. Staff time will be needed to monitor landings each June and evaluate whether the fishery is meeting the reference points prescribed by the HCR, or if an in-season modification or closure is warranted. If implementation of the HCR leads to sustainable certification of the fishery by MSC, a portion of shrimp caught in California waters but currently landed in Oregon may be landed at California ports in the future.

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Acronyms

BRD	Bycatch Reduction Device
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDFW/Department	California Department of Fish and Wildlife
Commission	California Fish and Game Commission
CPUE	Catch Per Unit Effort
EFH	Essential Fish Habitat
ESR	Enhanced Status Report
FGC	Fish and Game Code
FLD	Footrope Lighting Device
FMP	Fishery Management Plan
HCR	Harvest Control Rule
LED	Light Emitting Diode
MLDS	Marine Landings Data System
MLMA	Marine Life Management Act
MPA	Marine Protected Area
MSC	Marine Stewardship Council
NWFSC	Northwest Fisheries Science Center
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
ODFW	Oregon Department of Fish and Wildlife
PFMC	Pacific Fishery Management Council

PSMFC	Pacific States Marine Fisheries Commission
PSTG	Pink Shrimp Trawl Grounds
RCA	Rockfish Conservation Area
WDFW	Washington Department of Fish and Wildlife
WCGOP	West Coast Groundfish Observer Program

1. The Species

1.1 Natural history

1.1.1 Description

Pink shrimp(also known as ocean shrimp), *Pandalus jordani,* are crustaceans in the genus *Pandalus* and are closely related to the northern rough pink shrimp (*P. eous*). Pink shrimp have a hard outer shell and jointed legs, and can grow up to 6 inches (in; 15 cm) in length. They are uniform pink in coloration, with no stripes or spots, though their dark viscera can be seen through their translucent bodies. Pink shrimp have large, bulbous eyes and breathe through gills. The rostrum (a horn-like projection between the eyes) is 1.5 to 2 times longer than the carapace (hard plate covering the head and thorax). Pink shrimp are almost identical in size and coloration to the northern rough pink shrimp but lack a spine on their curved abdominal segment.

1.1.2 Reproduction

Pink shrimp are a short-lived, fast-growing, highly fecund species. They are protandric hermaphrodites, meaning they usually develop first as males and then transition to females. The age at transition can vary in response to environmental or population cues. Mating takes place during September and October. Fecundity (the number of eggs females produce) varies between years and areas (Hannah et al. 2011). Small females in their second year have been found to produce as few as 900 eggs per year, while larger shrimp in their third or fourth year of life may bear up to 3,900 eggs. After fertilization by packets of sperm, the female carries the eggs attached to the posterior swimming appendages until the eggs hatch during late March and early April.

Pink shrimp usually reproduce first as males and shift to female at age 1.5, but it is possible to have age groups that are composed of both males and females (Butler 1964). In some cases, the sex of shrimp can depend on the age distribution of the population (Charnov et al. 1978). When population sizes are low because there are few age-one shrimp entering the population as males, some older shrimp remain male. Conversely, when year-class strength is high, as much as 60% of age-one shrimp can be female and never breed as males. Young-of-the-year shrimp (hatched in the spring of a given year) settle to the bottom by late summer or early fall and may become vulnerable to fishing gear at the end of the fishing season, prior to achieving sexual maturity.

1.1.3 Larval biology and dispersal

There is a two to three month pelagic larval phase. Juveniles occupy successively deeper depths as they grow, and recruit to the fishery in the late summer, at about 5 to 6 months of age (Hannah et al. 2011).

1.1.4 Growth

After the pelagic larval period, juveniles may appear in commercial catches by late summer. Shrimp grow in steps by molting or shedding their carapace. Growth rates vary according to region, sex, age, and year class (Dahlstrom 1973). Pink shrimp generally grow faster in northern California than in Oregon, and age-one shrimp in California are often large enough to meet the minimum shrimp per pound restriction. There is a clear pattern of seasonal growth, with very rapid growth during spring and summer and slower growth during the winter (Frimodig et al. 2009).

Age-one shrimp range from 0.5-0.7 in (13-17 mm) in mean carapace length, age-two shrimp range from 0.7-1.0 in (18-25 mm), and age-3 shrimp range from 1.0-1.1 in (25-29 mm; CDFG 2008; Figure 1-1). Years with very high abundances can cause competition among cohorts for scarce resources, resulting in reduced growth rates.

Figure 1-1. Three age classes of prink shrimp. Credit: Robert Hannah, ODFW.

1.1.5 Natural mortality

Determining the natural mortality of marine species is important for understanding the health and productivity of a population. Natural mortality includes all causes of death not attributable to fishing such as old age, disease, predation, or environmental stress. Natural mortality is generally expressed as a

rate that indicates the percentage of the population dying in a year. Species with high natural mortality rates must replace themselves more often and thus tend to be more productive. Natural mortality and fishing mortality are combined to estimate total mortality of a stock.

Pink shrimp can live up to 5 years, but catches are often dominated by the age-one year class In California. Few shrimp survive beyond age four (Dahlstrom 1973). Natural mortality is high with the over-winter (between fishing seasons) survival rates estimated to be between 43% and 76% for shrimp aged one to three. Natural mortality may increase after age three (Dahlstrom 1973). Natural mortality rates may also change in response to the abundance of predator stocks, such as Pacific hake.

1.1.6 Pathology

Relatively little information is available on pathology for pink shrimp. Four microsporidian species have been found to infect pink shrimp and parasitize the skeletal muscles giving the body a whitish, opaque appearance but the occurrence of these parasites was found to be low (Olson and Lannan 1984).

1.1.7 Movement

Pink shrimp may be subject to some level of north/south or onshore/offshore transport due to ocean currents (Gotshall 1972). However, there is no evidence that they exhibit large, coast-wide migratory behavior. Larval transport between beds may occur since young-of-the-year shrimp live in the plankton for up to eight months before settling to the bottom. Pearcy (1970) speculated that nocturnal vertical migrations for feeding might also function as a dispersal mechanism with lateral displacement by currents.

1.2 Population status and dynamics

At-sea surveys were conducted by the California Department of Fish and Wildlife (Department) between 1959 and 1969 to obtain abundance estimates and set regional quotas. These surveys were costly, so a mathematical population model was developed to estimate the population size from 1969 until 1975. Use of the model was discontinued because pink shrimp violate a number of assumptions due to variable recruitment, growth, and mortality.

In 1981, a comprehensive coast-wide stock assessment was conducted using a Schaeffer surplus production model with catch and effort data from 1959 to 1980 (PFMC 1981). However, this model was inappropriate for stocks where biomass changes are driven by environmental fluctuations rather than the effects of fishing (Geibel and Heimann 1976).

Pink shrimp abundance off California varies substantially from year to year, which is largely attributed to environmental factors causing natural fluctuations in recruitment. This is a source of major uncertainty and prevents reliable long-term forecasting. Equilibrium-based models such as catch-at-age and yield-per-recruit have also been unsuccessful at determining stock status and meaningful reference points for pink shrimp. Environmental models have been more successful at accounting for the variation observed in catch, but have found no significant effects of fishing on future stock size (a stock-recruitment relationship; Hannah 1993). The importance of environmental factors on pink shrimp recruitment and distribution suggests fishing pressure may have relatively less influence on stock status.

Catch has varied widely from year to year, and catch-per-unit-effort (CPUE) has been relatively high since 2010. From 2011 to 2013, landings on the west coast were high, but have declined since 2015. A reduction in catch occurred during the strong El Niño in 2016 but was not as dramatic as those associated with previous strong El Niños.

1.2.1 Age structure of the population

The age structure of the portion of the stock in California waters has not been assessed recently; however, some insight into age structure might be found in Oregon data, as the states are believed to be fishing a common stock and a significant portion of the catch landed in Oregon is harvested from waters off the California coast (ODFW 2020). Oregon has an extensive monitoring program for the fishery and annually tracks the age composition of shrimp caught off Oregon (Figure1-2). Because the pink shrimp stock crosses the California-Oregon border, and a sizeable portion of the catch landed in Oregon is caught off California, the age structure of Oregon catches is likely representative of stock conditions in California. The age structure of the pink shrimp off Oregon was found to have been altered by intensive fishing since the 1970s (Hannah and Jones 1991). The proportion of first-time breeders (age-one individuals) had increased from ~30% to ~70% of the catch. This may have impacted the spawning potential of the stock but a shift to a younger population increases overall biomass productivity since growth is slower with an older population.

In the late 2000s and early 2010s, age-two shrimp dominated the catch, and as a result, the age-three component of the 2012 stock was the highest observed since 1978 (ODFW 2013). It is hypothesized that the high population levels allowed fishermen to avoid the smaller (and less valuable) age-one year class, delaying their capture by one year (ODFW 2014a). In 2016, catches were dominated by age-one shrimp from a large recruitment event the previous year.

In 2017, a more even age distribution was observed but was followed by another year dominated by age-one shrimp. This alternation between a year dominated by age-one shrimp followed by one with more even age distribution has been commonly seen in the past.

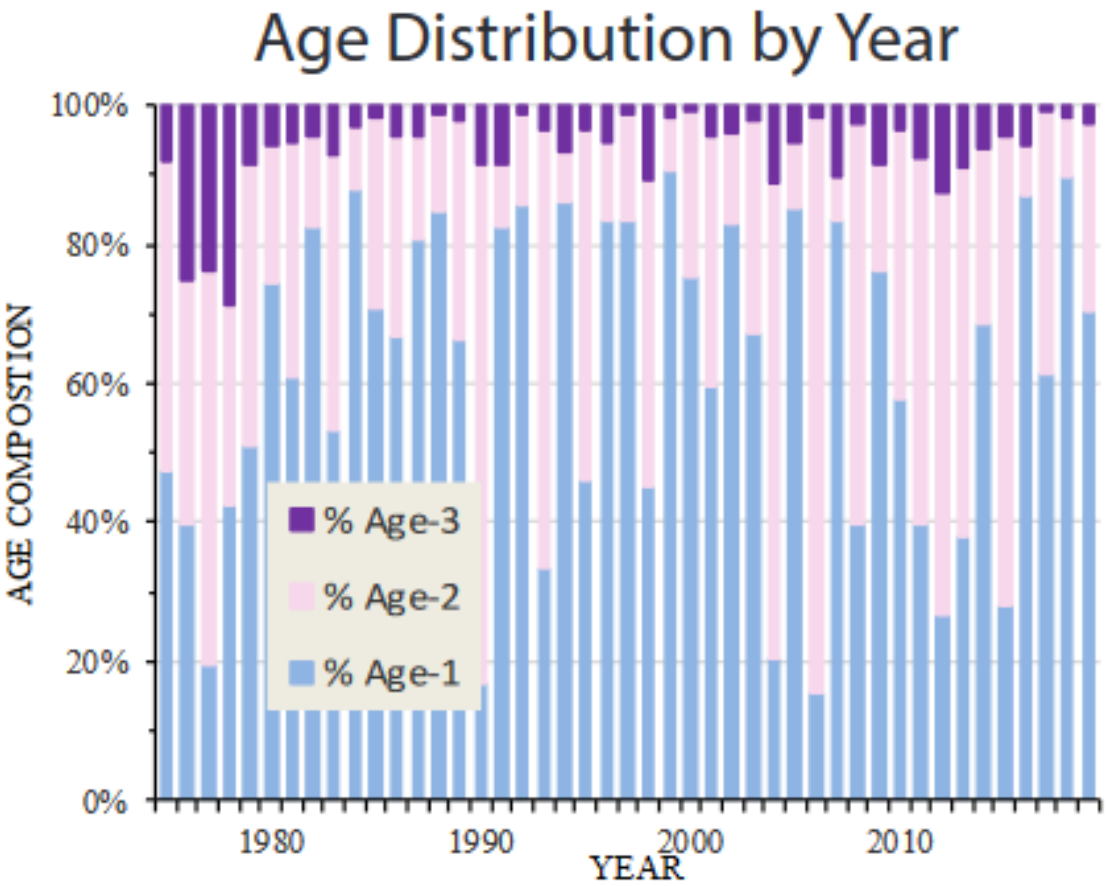

Figure 1-2. Annual percent (%) age composition of pink shrimp landed into Oregon, 1975-2019 (Reproduced from ODFW 2020).

1.3 Habitat

Pink shrimp range from southeast Alaska to Baja California but are only most abundant from Point Arguello to British Columbia (Hannah and Jones 2007; Figure 1-3). It is thought that a single genetic stock exists throughout their entire range (OST 2014).

Pink shrimp are found at depths between 150 to 1,200 ft (Dahlstrom 1973) but tend to be caught between 300 and 600 ft in California (average reported depth from logbooks is 444 ft). They generally inhabit deep waters, aggregating near the bottom during the day in well-defined areas of sandy mud or "green mud" and ascending into the water column at night to feed.

Figure 1-3. Range of pink shrimp.

1.4 Ecosystem role

Pink shrimp occupy a central position in the trophic structure of their ecosystem because they feed on zooplankton and are forage for a number of fish species. They are also highly responsive to changing environmental conditions. Due to this sensitivity and their short life span, species in the genus *Pandalus* have been shown to be early indicators of regime shifts, such as from predominantly cool, productive oceanic conditions to warmer, low productivity conditions (Anderson and Piatt 1999).

Pink shrimp have no known associated species. However, the closely related aesop shrimp (*P. montagui*) lives in association with the reef-building polychaete worm known as the Ross worm (*Sabellaria spinulosa*; Last et al. 2012).

Pink shrimp are important prey for several fish species, including those of commercial importance. These include Pacific hake, arrowtooth flounder, sablefish, petrale sole, spiny dogfish, and several species of rockfish and skates (CDFG 2008; NWFSC 2010). By ascending the water column and feeding primarily at night (Pearcy 1970; Gotshall1972), pink shrimp may reduce their susceptibility to visual predators (Pearcy 1970). Schooling is another behavior which reduces predation rates for pink shrimp.

Pink shrimp ascend into the water column at night to feed on zooplankton, primarily krill (various euphausiid species) and copepods (Pearcy 1970). During the day, pink shrimp caught in bottom trawls were found feeding on benthic organisms (mollusks and polychaetes) and detritus (Pearcy 1970).

1.5 Effects of changing oceanic conditions

Pink shrimp have a high tolerance for a range of salinities, but a fairly narrow optimal temperature range between 8-11˚C which could make them vulnerable to climate change. Fluctuations in temperature from year to year may impact the survival, metamorphosis, and growth of larvae (Rothlisberg 1979). In addition, bottom temperature may influence the fecundity of shrimp (Hannah 2011). Recruitment of young-of-the-year shrimp has been negatively correlated with El Niño Southern Oscillation cycles. Coastal upwelling, which can vary from year to year, may influence the location of shrimp beds (Hannah 2011). The timing of spring transition, marked by increased offshore winds, increased upwelling, and decreased sea level height, has been linked to strong recruitment. The mechanism for this correlation may be related to cool, nutrient-rich waters promoting recruit survival. However, it is thought that very strong upwelling and associated very low sea levels transport larvae offshore, reducing recruitment (Hannah 2011).

There are indications that climate change could significantly alter recruitment patterns and distribution of pink shrimp over time (Hannah 2011). It is possible that warmer waters may drive pink shrimp populations further north and limit access to the resource in California. Pink shrimp recruitment success is environmentally driven and there is evidence that environmental variability has been increasing since 1980 (Shanks and Roegner 2007).

Pink shrimp off the coast of California have experienced greater interannual variability than stocks farther north over the last few decades (Hannah 2011) and this may increase in the future because of the effects of environmental variability on recruitment. This possibility underscores the need to maintain a consistent fishery monitoring and sampling program for the pink shrimp fishery going forward as well as the value of the potential new management approaches described below. Additional research is needed to better understand the effects of climate change on the pink shrimp stock.

2. The Fishery

2.1 Location of the fishery

Washington, Oregon, and California have active pink shrimp fisheries. Pink shrimp are most abundant off the coast of Oregon where the largest proportion of the fishery occurs. Smaller catches occur off California and Washington. Since 2007, the majority of California landings have been concentrated in the northernmost counties of Humboldt and Del Norte. Historically, most fishing occurred in federal waters. Trawling for shrimp in state waters has been prohibited since 2008. Because pink shrimp are near the sea floor during the day and ascend into the water column at night, they are targeted during the day, using benthic trawl gear that drags along the sediment. Beds with commercial densities have been mapped, and while the largest beds occur off the coast of Oregon, commercial beds can be found from southern California to British Columbia.

2.2 Fishing effort

2.2.1 Number of vessels and participants over time

The number of active vessels fluctuated during the 1970s and mid-1990s with a peak in 1994 followed by a nearly steady decline to an all-time low in 2006 (Figure 2-1). The decline was augmented in 2003 by a voluntary federal buyout instituted for groundfish trawl vessel permits which removed almost one-half the capacity of the west coast trawl fleet including many vessels which also had pink shrimp permits. Since 2006, the number of active vessels has increased steadily for more than 10 years.

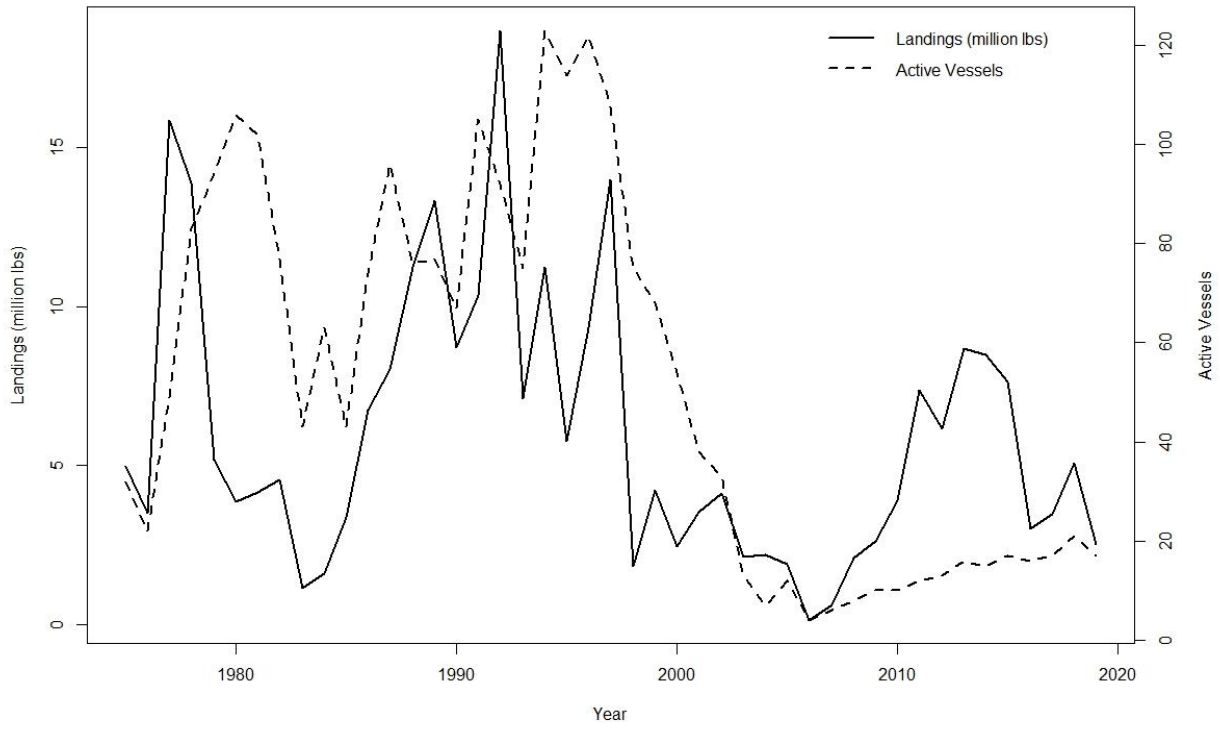

Figure 2-1. Number of active vessels and landings (million lb) in the California pink shrimp fishery, 1970-2019. Data: CDFW Marine landings data system (MLDS).

In 2001, the fishery was divided into northern and southern regions. Each region requires its own separate permit. Participation in the northern fishery (California-Oregon border to Point Conception) is restricted and requires a limited entry permit; the southern fishery (Point Conception to the California-Mexico border) also requires a permit but is open access. As of 2020, the northern fishery had 39 permits (35 transferable, 4 non-transferable) and the southern fishery had 15 permits. This information will be periodically updated in the Enhanced Status Report (ESR) for pink shrimp, available at https://marinespecies.wildlife.ca.gov.

Fishing effort can be measured in three different ways: 1) number of vessels fishing per season, 2) number of trips per season, and 3) fishing hours. The number of vessels fishing may vary from year to year in response to fluctuations in either shrimp abundance or price per pound. For this reason, number of trips or hours fished may be a more accurate and standardized way to measure fishing effort. In Oregon, number of fishing hours per season has shown more year to year variation than number of vessels or number of trips (ODFW 2020). Looking only at pink shrimp landings in California does not cover all the impacts to California pink shrimp populations since recently, vessels catching pink shrimp

off California land more shrimp in Oregon ports than in California ports (see section 2.3 Commercial Landings).

2.2.2 Type, amount, and selectivity of gear

Pink shrimp are targeted via benthic trawl gear during the day when they are concentrated near the sea floor. The average vessel in the pink shrimp fleet is 60 ft long (CDFW Automated License Data System 2019), a slight increase from the 59 ft average length noted between 2001 and 2006 (Frimodig et al. 2009).

Prior to 1974, only single-rigged vessels were used to target shrimp (Figure 2-2, left). From 1952 to 1963, pink shrimp fishermen were limited to the use of beam trawls with a minimum mesh size of 1.5 in (38 mm). After 1963, the use of otter trawls with the same size mesh was also permitted. In 1975, the mesh size was reduced to 1.38 in (36 mm) north of Pigeon Point (San Mateo County). After double-rigged vessels entered the fishery, they comprised approximately 25% of the California fleet in the late 1970s and increased to nearly 50% during the 1980s and 1990s. In the early 2000s, there was a great deal of latent capacity in the pink shrimp fishery. Less than 50% of permits were actively fished in the northern region, and less than 25% were fished in the southern region. Participants in the pink shrimp fishery are often also engaged in the groundfish and Dungeness crab fisheries. In 2003, NMFS implemented a federal groundfish fishing capacity reduction program, which resulted in the purchase and retirement of 31 California permits.

Today, most vessels in the northern fleet are double-rigged and use an otter trawl on each side of the vessel (Figure 2-2, right). A majority of vessels in the southern fleet are single-rigged and use a single trawl.

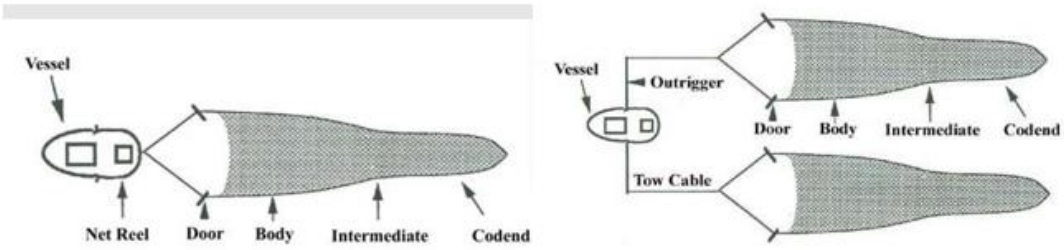

Figure 2-2. Diagram of a single-rigged (left) and double-rigged (right) shrimp vessel. Reproduced from Jones et al. 1996.

2.3 Landings in the recreational and commercial sectors

Pink shrimp are an exclusively commercial fishery. The typical location and depth of the species make it an unlikely target for a recreational fishery. Commercial landings peaked in the late 1980s and 1990s and decreased from a

high of over 18 million lb in 1992 to a record low of 0.15 million lb in 2006 (Figure 2-3). Fluctuations in landings are primarily thought to reflect natural variability in the pink shrimp population size from year to year due to environmental conditions (Hannah 1993; Hannah 2010) but decreases in landings also can result from reduced fishing effort (Figure 2-1). Annual landings were below average in both California and Oregon from 2000 to 2010. Landings increased from 2010 to 2015 but have declined and fluctuated at lower levels after 2015. Since 2001, 90% of the state's landings have occurred in northern California. Landings data will be periodically updated in the pink shrimp ESR.

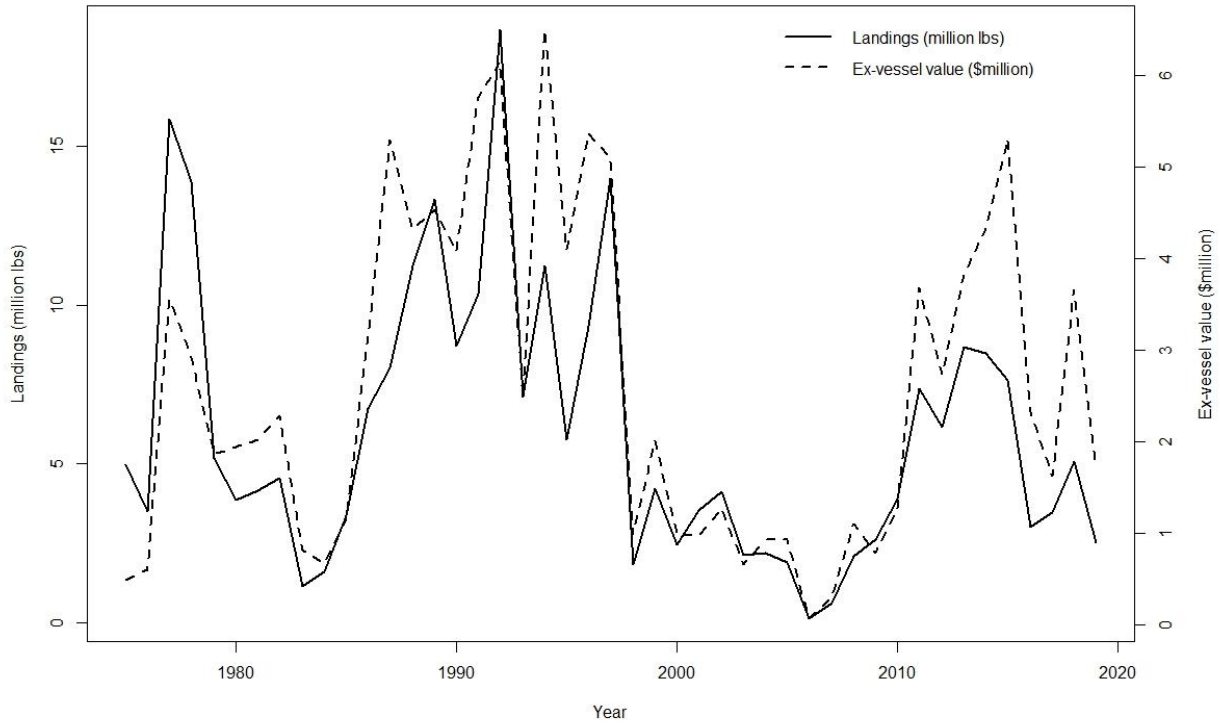

Figure 2-3. California pink shrimp landings (million lb) and value (million dollars), 1970-2019. Data: CDFW MLDS.

The distribution of the fishery has changed in recent years. From 1981 through 2006, 18% of the total west coast catch of pink shrimp was landed in California ports, 57% was landed in Oregon ports, and 25% was landed in Washington ports (Frimodig et al. 2009). From 2007 through 2018, landings in California declined to 9% while Oregon increased to 67%. Washington landings remained relatively unchanged at 24%. Much of this change is due to increases in the amount of pink shrimp caught off California but landed in Oregon (Figure 2-4).

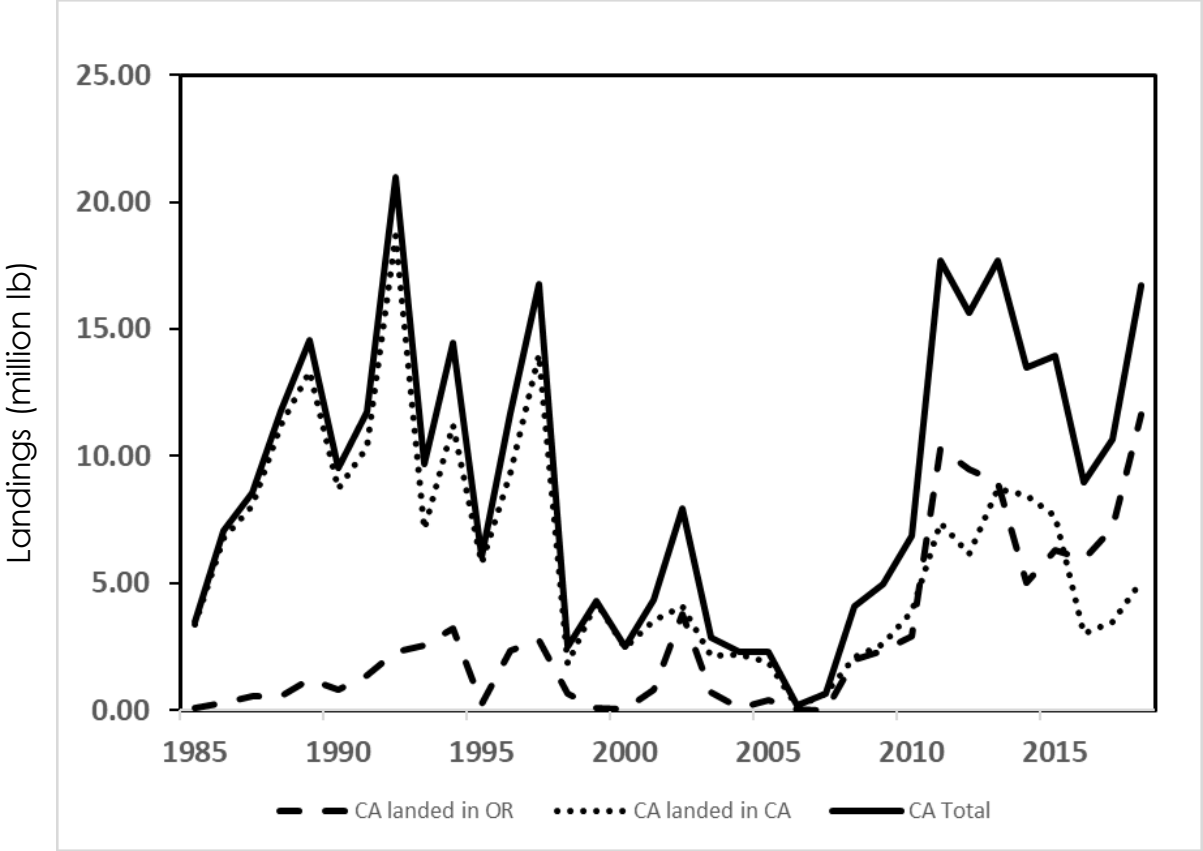

Figure 2-4. Landing state, and weight of landings (million lb) of pink shrimp harvested in California waters, 1985-2018.

There are a significant number of Oregon-permitted vessels that fish in federal waters off California but land in Oregon. Prior to 2008, the amount of pink shrimp caught off California and landed in Oregon was relatively small compared to the amount caught off and landed in California. From 2008 to 2015, the amount of California pink shrimp landed in California and Oregon was nearly equivalent (Figure 2-4). Marine Stewardship Council (MSC) certification for Oregon probably contributed to the increase in the amount of pink shrimp caught off California and landed in Oregon (See section 2.6 for California efforts to obtain MSC certification). Other factors contributing to the increase of California caught pink shrimp being landed in Oregon are closure of the Pink Shrimp Trawl Grounds (PSTG) within California state waters in 2008 and reduced processing capacity in recent years. After 2015, significantly more California pink shrimp have been landed in Oregon than in California. In 2020, landings in California were very low due to the closure of the main processing plant in the state. California permitted vessels also fish in Oregon waters, but this represents a much smaller percentage of the total landings.

2.4 Social and economic factors related to the fishery

Pink shrimp vessels deliver their catch to shore side processors (NWFSC 2010), where shrimp are usually shelled, cooked and frozen prior to sale as salad shrimp or cocktail shrimp (CDFG 2008). Currently, most of the pink shrimp catch is exported to Europe. European markets place a high value on MSC certification, prompting the Oregon fleet to obtain MSC certification in 2007. In 2015, both the Washington and California pink shrimp fisheries applied for MSC certification (MRAG Americas 2015). While Washington was approved, California was not due in part to a lack of an FMP with clear target and limit reference points. The California fishery is expected to re-apply for MSC certification in 2021. An analysis conducted by MRAG Americas found this FMP sufficiently addresses the shortfalls that prevented certification of the fishery in 2015 (MRAG Americas 2021; Appendix B).

The ex-vessel value of the California pink shrimp fishery has ranged from $0.1-7 million (Figure 2-1) but the combined value for the U.S. West Coast fishery is muchgreater. In 2015, California, Oregon, and Washington fishermen harvested a record 103 million lb valued at $75.6 million. From 2016 through 2019, west coastlandings ranged from 52.9 million lb ($36 million) to 33 million lb ($17.2 million)while California landings ranged from 5.1 million lb ($3.7 million) to 2.5 million lb($1.7 million). The majority of California landings occur in Crescent City (78%),followed by Eureka (16%) and Morro Bay (3%) (Figure 2-5).

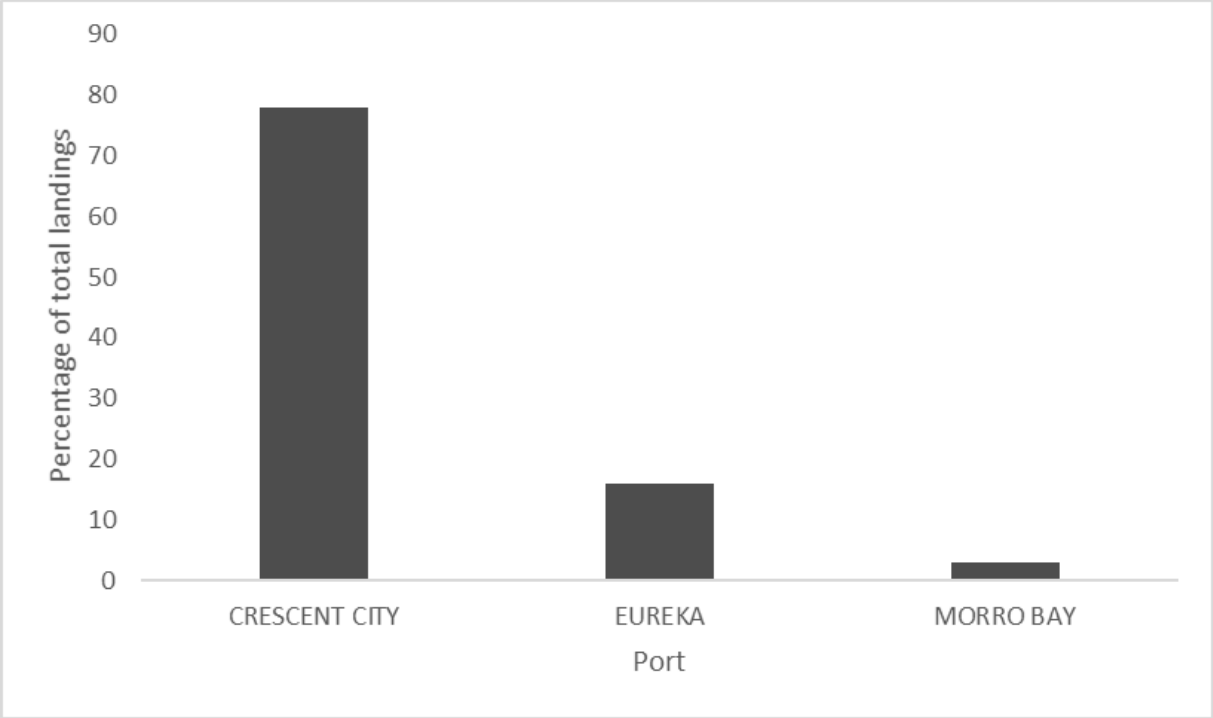

Figure 2-5. Percentage of California pink shrimp landings by port, 2019. (CDFW MLDS)

Shrimp price and abundance play important roles in determining fleet size in the pink shrimp fishery. The price per pound before 2000 peaked at $0.87 in 1987, coinciding with a period of very high landings (CDFG 2008). The average ex-vessel price of shrimp has varied between $0.30 and $1.13 per lb since 2002 (Table 2-1). In recent years, price per pound has often been $0.70 or higher.

Since 2007, most of the catch has been harvested off Eureka and landed primarily into the ports of Crescent City and Eureka. As of March 2020, there were no processing plants operating in California and all shrimp landings are trucked to Oregon for processing. Processors have indicated MSC certification of the California pink shrimp fishery may lead to the reopening of processing plants.

Table 2-1. Total California pink shrimp landings in pounds, ex-vessel value, and average ex-vessel price per pound (CDFW MLDS 2020).

Year	Pounds	Value	Price
2001	3,509,326	$961,670	$0.27
2002	4,116,213	$1,275,015	$0.31
2003	2,147,198	$655,431	$0.31
2004	2,187,520	$925,062	$0.42
2005	1,893,913	$925,203	$0.49
2006	139,901	$66,296	$0.47
2007	636,944	$301,695	$0.47
2008	2,084,404	$1,094,707	$0.53
2009	2,609,170	$782,876	$0.30
2010	3,904,052	$1,274,496	$0.33
2011	7,375,139	$3,684,168	$0.50
2012	6,152,197	$2,740,417	$0.45
2013	8,501,520	$3,732,135	$0.44
2014	8,476,677	$4,334,173	$0.51
2015	7,646,530	$8,620,665	$1.13
2016	3,021,074	$2,330,321	$0.77
2017	3,470,780	$1,627,788	$0.50
2018	5,086,164	$3,659,889	$0.75
2019	2,539,803	$1,731,027	$0.70

In addition to poor recruitment, a combination of economic factors including competition from other shrimp fisheries, increased aquaculture production worldwide, higher fuel prices, and limited processor availability may explain the reduction in landings during the mid-2000s, (CDFG 2008). Processors can impose trip limits on shrimp fishermen according to the plant's processing ability (Figure 2-6). Pink shrimp are subject to a landing fee of $0.0047 per lb. All of these factors suggest that economics can be just as influential as abundance in dictating fishing behavior in this fishery. Information in this section will be periodically updated in the pink shrimp ESR.

Figure 2-6. Pink shrimp processessing. Credit: CDFW.

3. Management

3.1 Past and current management measures

In 1952, the California pink shrimp trawl fishery was divided into three regulatory areas, and a quota was set for each area at 25% of estimated abundance from at-sea surveys (CDFG 2008). Later, a stock assessment model was used to set quotas due to the high cost of yearly surveys but was ultimately found to be inappropriate given pink shrimp population levels were influenced more by environmental variability than stock status. In addition to regional quotas, regulations also specified mesh sizes and types of allowable trawl gear. The quota system was in place until 1976, when current regulations were enacted.

In response to declining CPUE rates in the 1970s, the Pacific Fishery Management Council (PFMC) drafted a FMP for pink shrimp along the entire west coast. Since most shrimp fishing occurred in federal waters, a federal management plan would provide consistent regulation across the three states. However, the FMP was never adopted and the PFMC recommended a coordinated management system by the three states (Parsons et al. 2013). In 1981, pink shrimp regulations were adopted by the states to establish uniform coast-wide management. The resulting regulations, which are still in effect today, are summarized in section 3.1.1.

The PFMC retained authority over the California pink shrimp fishery until 2004, when management authority was transferred to the California Fish and Game

Commission (Commission; CDFG 2007). At this time, the California legislature also granted the Commission management authority over California's commercial bottom trawl fisheries (FGC §8841 and §8842). Since 2004, the California pink shrimp fishery has been principally state-managed, although some federal regulations still apply, such as daily and monthly trip limits for incidental catches of groundfish, use of a vessel monitoring system in federal waters, and area restrictions protecting groundfish Essential Fish Habitat (EFH).

There have been three major regulatory changes affecting the pink shrimp fishery since 1981. In 2001, the three regulatory areas in California were eliminated. The fishery was divided at Point Conception into northern and southern management regions, with separate permits issued for each region. Second, bycatch reduction devices (BRDs) were required statewide in 2002 (Frimodig et al. 2009). The configuration of these devices, and their effects on bycatch levels, is discussed in section 3.1.3.2.4. Finally, in 2008 the Commission closed the pink shrimp trawl grounds (PSTG), banning all pink shrimp fishing within state waters. Historically, approximately 10% of California pink shrimp were caught within state waters, with the remainder captured in federal waters (>3 miles offshore). The closure of the PSTG provides an added measure of protection against overfishing pink shrimp populations off California.

3.1.1 Overview and rationale for the current management framework

California's pink shrimp fishery is currently managed using a suite of static regulations to promote the sustainability of the target species. Although the fishery has regional permits and capacity goals, regulations are identical in both regions (14 California Code of Regulations (CCR) §120.1):

1. A seasonal closure from November 1 through March 31 to protect egg-bearing females.
2. A minimum mesh size of 1.38 in (36 mm) to allow for escapement of small 0- and 1-year old shrimp.
3. A prohibition on landing shrimp that exceed the maximum count-per-lb of 160. This is intended to limit the take of small 1-year old shrimp.
4. The required use of BRDs, including rigid grate excluders, soft panel excluders, and fisheye excluders.

3.1.1.1 Criteria to identify when fisheries are overfished or subject to overfishing, and measures to rebuild

Prior to the development of the harvest control rule (HCR) described in section 5, there was no direct reference point available to specify the level of fishing that

constitutes "overfishing" or "overfished" status. However, regulation specifies a maximum count-per-lb (160 shrimp) to prevent catch of too many small (1-yr-old) shrimp. The rationale behind this regulation is that large catches of small shrimp could be an indicator of overfishing, and that larger shrimp have already been caught. Continuing to fish when too many age-one shrimp are in the catch may imperil the sustainability of the resource. The regulation prohibits fishermen from landing shrimp that would exceed the maximum count, but there is no link to a management decision.

There is also no direct reference point available to specify the size at which the pink shrimp population would be considered "overfished".

There are currently no regulations or procedures in place to halt overfishing when it is found to be occurring, or to rebuild populations when they fall below biomass thresholds. There are no rebuilding targets (specified in either abundance or catch rates) for this fishery. The Marine Life Management Act (MLMA) specifies that the period for preventing, ending, or otherwise appropriately addressing and rebuilding the fishery shall be as short as possible, and shall not exceed ten years except in cases where the biology of the population of fish or other environmental conditions dictate otherwise (FGC §7086(c)(1)).

3.1.1.2 Past and current stakeholder involvement

Stakeholder involvement has primarily occurred during regulation changes affecting the pink shrimp fleet. Amendments to regulations pertaining to pink shrimp trawling (CCR Title 14 §120) were last made in 2008 when primarily organizational changes were made. In the early 2000s, statutory changes were made giving regulatory authority to the Commission and requiring BRDs. The restricted access program was developed in 2000 and applies to the northern pink shrimp only. During each of these changes, stakeholders were consulted and had an opportunity to comment through the Commission process.

The 2015 California pink shrimp fishery MSC application did not meet the standard for stakeholder communication. Since then, the Department has improved two-way communication with the fleet and processors. This has and will improve collaboration with the fleet on stock dynamics and management actions as well as increasing transparency in Department decision making. The Department hosted a fleet meeting in Eureka in March 2017 and participated in discussions on pink shrimp capacity at the November 2017 meeting of the Commission's Marine Resource Committee. An online meeting was also conducted by the Department in October 2019 to discuss current developments within the fishery. The Department has also held informational webinars in May

2020 and 2021. The Department intends to hold annual meetings to keep the industry informed of changes and developments concerning the fishery. Information obtained at these meetings is considered by the Department and can lead to changes in management of the fishery. Industry desire to obtain MSC certification has driven the development of this FMP, and the changes described in section 5.9 "Establishing accurate weights" address concerns raised by the fleet at the May 2021 meeting. An early draft of this FMP was circulated to the fishery for input in July 2021 and received supportive comments. Any critical comments or requests for changes would have been considered and potentially addressed in the FMP.

3.1.2 Target species

3.1.2.1 Limitations on fishing for target species

3.1.2.1.1 Catch

There is no quota currently in place for pink shrimp, and no pre-determined procedure available for setting or changing a quota.

3.1.2.1.2 Gear

There is a minimum mesh size of 1.38 in (36 mm) to allow juveniles (young-of-the-year) to escape (CCR Title 14 §120). Oregon and Washington do not have mesh size regulations. The use of bycatch reduction devices is required, see discussion in section 3.1.3.2.4.

3.1.2.1.3 Season

The fishery is closed from November 1 through March 31 to protect egg-bearing females. There has been some discussion of expanding the seasonal closure to May 1 to increase protection of egg-bearing females since a small proportion of shrimp are egg-bearing at the beginning and end of the season, and many are below market size. For various reasons, especially price negotiation between the fleet and processors, the season in California rarely starts on time and historically little fishing has occurred in April, so extending the closed period is not likely to affect the fishery significantly. However, the states have not yet come to a consensus on this issue.

3.1.2.1.4 Sex

There are no restrictions on the sex of shrimp that can be retained but females tend to be larger and have higher value based on their larger size.

3.1.2.1.5 Size

A maximum count-per-lb (160 shrimp) effectively functions as a size limit and prevents excessive capture of juvenile shrimp. Price is based on size with larger shrimp being more valuable, providing incentive to target larger shrimp.

3.1.2.1.6 Area

Trawling for pink shrimp is currently only allowed in federal waters. State waters previously open to trawling (known as PSTG) were closed in 2008. The PSTG was defined as the area in state waters more than two nautical miles from the mainland shore between False Cape (Humboldt County) and Point Reyes (Marin County; Frimodig et al. 2009). The PSTG encompasses an area of 307 square miles. However, only three beds, comprising 17% of the PSTG, have ever been fished. Two of the beds are located north of Fort Bragg and the third is adjacent to Bodega Harbor. In combination, these three beds span approximately 52 square miles of ocean bottom in state waters but most of the historical trawl locations were outside the PSTG (Frimodig et al. 2009). The Commission may reconsider the PSTG closure if it is deemed that trawl gear meets the following performance criteria (FGC §8842):

1. Minimizes bycatch.
2. Will not damage seafloor habitat.
3. Will not adversely affect ecosystem health.
4. Will not impede reasonable restoration of kelp, coral, or other biogenic habitats.

3.1.2.1.7 Effort-based harvest regulations

While biological regulations serve to lessen the impact of fishing on the stock, effort-based regulations protect the portion of the stock that is legally harvestable by controlling fishing effort. The northern and southern fisheries manage fishing effort differently. The fishery in the southern region is open access, with no cap on permit issuance (CDFG 2008). Effort in the northern fishery is managed by a restricted access approach described below.

3.1.2.2 Description of and rationale for any restricted access approach

The restricted access program was developed in 2000. Historical landings were a criterion for northern permit eligibility and transferability was given to those participants meeting minimum landing requirements in the first year of holding the permit. A capacity goal of 75 permits was established as it is near the midpoint of permits issued between the years of 1977 (53 permits) and in 1980 (104 permits). Regulations stipulate the Department shall evaluate the capacity

goal every three years and report to the Commission with a recommendation regarding issuance of new permits (CCR Title 14 §120.2(h)). The Department performed a capacity review in 2017 following a constituent's petition for creation of new permits. The Department concluded the current fleet size is sufficient to match historic high catch levels when combined with catch from vessels landing California shrimp in Oregon (Figure 2- and Figure 2-). Following Departmental review, the Commission decided that increasing capacity was not warranted at the time and that addressing management needs (i.e., LED lights to reduce eulachon bycatch and implementing an HCR was a higher priority. Implementation of this FMP will address management needs and may lead to the fishery becoming MSC certified, which may alter participation and the fishery. Capacity will continue to be evaluated by the Department, and changes recommended to the Commission if they are needed.

3.1.3 Bycatch

The Fish and Game Code (FGC) §90.5 defines bycatch as "fish or other marine life that are taken in a fishery, but which are not the target of the fishery." Bycatch includes "discards," defined as "fish that are taken in a fishery but are not retained because they are of an undesirable species, size, sex, or quality, or because they are required by law not to be retained" (FGC §91). The term "Bycatch" may include fish that, while not the target species, are desirable and retained as incidental catch.

Historically, trawling had high bycatch rates. In some parts of the world, shrimp trawl fisheries caught as much as 30 lb of bycatch for 1 lb of target species (Alverson et al. 1994). Improvements in gear have reduced bycatch significantly. Data collected by the West Coast Groundfish Observer Program (WCGOP) observers and summarized on an annual basis for coastwide pink shrimp fisheries shows a low discard rate between 2-5% of the total catch over the last decade from 2010-2019 (Somers et al. 2021).

3.1.3.1 Amount and type of bycatch (including discards)

The majority of bycatch in the pink shrimp fishery is composed of groundfish species. Since 2004, when the WCGOP began, an average of 14% of pink shrimp trips have been observed (Somers et al. 2016a). On those observed trips, pink shrimp trawlers in California caught 40 species of groundfish as bycatch. The ratio (by weight) of catch of non-shrimp species to pink shrimp has been less than 5% since 2007 (Somers et al. 2016b). Pacific hake comprised the largest amount of incidental catch (Table 3-1).

Table 3-1. Estimated catch (mt) of groundfish species and percent discarded in the California pink shrimp fishery, 2017. Species present in minor amounts (<0.10 mt) excluded. To estimate total catch of groundfish, catch of groundfish (discard ratio) from observed pink shrimp catch were applied to unobserved catch (Somers et al. 2019). Total pink shrimp landings in California in 2017 was 1,574 mt (CA Marine Landings Data System).

Common name	Species	Total catch (metric ton)	Total percent discarded
Pacific hake	*Merluccius productus*	79.97	100
Rex sole	*Errex zachirus*	4.84	100
Stripetail rockfish	*Sebastes saxicola*	4.36	100
Splitnose rockfish	*Sebastes diploproa*	2.88	100
Shortbelly rockfish	*Sebastes jordani*	2.23	100
Dover sole	*Microstomus pacificus*	1.70	100
Flatfish unid	*Pleuronectiformes*	1.54	100
Chilipepper rockfish	*Sebastes goodei*	1.07	100
Pacific sanddab	*Citharichthys sordidus*	1.01	100
Shelf rockfish unid	*Sebastes spp.*	0.58	100
Aurora rockfish	*Sebastes aurora*	0.38	100
Nearshore rockfish unid	*Sebastes spp.*	0.28	100
Arrowtooth flounder	*Atheresthes stomias*	0.13	100
Sablefish	*Anoplopoma fimbria*	0.12	100
Bocaccio	*Sebastes paucispinis*	0.12	100

The pink shrimp fishery also interacts with over 80 non-groundfish species, including both finfish and invertebrates. In 2017, slender sole and non-Humboldt squid were the most common non-groundfish bycatch species by weight (Table 3-2).

Table 3-2. Estimated catch (mt) of non-groundfish species and percent discarded in the California pink shrimp fishery, 2017. Species present in minor amounts (<0.02 mt) excluded. To estimate total catch of groundfish, catch of groundfish (discard ratio) from observed pink shrimp catch were applied to unobserved catch (Somers et al. 2019). Total pink shrimp landings in California in 2017 was 1,574 mt (CA Marine Landings Data System).

Common name	Classification	Total catch (metric ton)	Total percent discarded
Slender sole	*Lyopsetta exilis*	10.08	100
Non-Humboldt squid sp.	*Teuthida*	1.67	100
Non-Eulachon smelt sp.	*Osmeridae*	0.05	100
Sculpin unid	*Cottidae*	0.04	100

3.1.3.2 Assessment of sustainability and measures to reduce unacceptable levels of bycatch

3.1.3.2.1 Discard mortality

Due to the depth at which pink shrimp trawling occurs (300-800 ft), it is assumed that the mortality of captured finfish species with swim bladders is 100% due to barotrauma. Discard mortality of other species is unknown.

3.1.3.2.2 Impact on fisheries that target bycatch species

The most significant bycatch of a commercially important species is Pacific hake (Somers et al. 2019). Estimated incidental catch of Pacific hake by the California pink shrimp trawl fleet was less than 0.02% of the 2017 US Pacific Hake quota of 431,433 mt (Ryall and Lockhart 2017). As a result, it is unlikely that incidental catch of Pacific hake by the California pink shrimp fleet is detrimental to the stock or the Pacific hake fishery.

3.1.3.2.3 Bycatch of overfished, threatened, or endangered species

Pink shrimp beds overlap with the habitat of a number of sensitive species, including recently rebuilt rockfish species such as darkblotched rockfish (*Sebastes crameri*), Pacific ocean perch (*S. alutus*), widow rockfish (*S. entomelas*), canary rockfish (*S. pinniger*) and overfished species such as yelloweye rockfish (*S. ruberrimus*). The bycatch rates for all rebuilt and overfished

rockfish have been less than 0.01%. At this level, the pink shrimp fishery is not impacting these species (Somers et al. 2017).

While there have been no documented interactions of threatened or endangered marine birds or mammals, Oregon, Washington, and California pink shrimp fisheries do catch eulachon (Al-Humaidhi et al. 2012). These anadromous smelts inhabit the Pacific coasts of North America, and the Southern Distinct Population Segment of the species, which are caught in the pink shrimp fishery, were listed as threatened in 2010 (NMFS 2010). The factors causing the declining eulachon abundance are not well understood, though climate change, predator-prey interactions, changes in the timing of peak river flows due to dams and water diversions, and mortality from the pink shrimp trawl fishery may play a role (Gustafson et al. 2012; NWFSC 2010).

Hannah et al. (2011) estimated the fishing mortality rate (F) imposed by the pink shrimp fishery on the eulachon population at well below the F = 0.1 rate recommended as sustainable by Schweigert et al. (2012) and far below the values determined by setting fishing mortality at the natural mortality rate, a commonly used rule of thumb for sustainability. The low fishing mortality rate estimates are in part due to the shrimp fishery occupying a smaller geographic footprint than the eulachon population and is unlikely to have as much influence on the eulachon population as variation in the ocean environment or the abundance and distribution of major predator populations like Pacific hake.

In 2018, both Oregon and Washington implemented regulations requiring the attachment of LED lights to the footropes of the trawl nets (collectively referred as footrope lighting device, or FLD). This method has shown to be highly effective at reducing eulachon bycatch (see following section), and was specifically identified by NMFS as a recovery action to be taken to eliminate or sufficiently reduce the severity of the threat posed by shrimp trawl fisheries (NMFS 2017). That same year, the Department collaborated with Oregon and Washington on a Section 6 Species Recovery Grant to purchase LED lights and distribute them to active fishermen in the fleet (grant # NA18NMF4720098). Through this grant FLDs and the information on their use were distributed to 15 California vessels prior to the start of the 2019 season.

Following the mandatory FLD use in Oregon and Washington, and voluntary use in California, eulachon bycatch decreased significantly. Bycatch estimates for Oregon and Washington dropped to 26.88 mt and 32.32 mt of eulachon, respectively, compared to the estimated 217.94 mt for Oregon and 360.13 mt for Washington in 2015. Bycatch in California reached an all-time estimated low of 0.02 mt in 2019, compared to an estimated 32.34 mt in 2015 (Gustafson et al.

2021a). Due to the effectiveness of FLDs and the existing requirements in Oregon and Washington, the use of FLDs will be required in the California fishery as part of this FMP's implementation (see section 5). It is important to note that this FMP is a state document produced under the authority of state law. The take of federal Endangered Species Act-regulated species, on the other hand, falls under federal jurisdiction. The federal government may implement additional management measures for the purpose of conserving eulachon populations in the future, but it will depend on the status of those populations as well as the state of the pink shrimp fishery.

3.1.3.2.4 Measures to reduce bycatch

Starting in 2002, the PFMC required the use of BRDs for all shrimp vessels to reduce finfish bycatch rates. Prior to the required use of BRDs, bycatch rates in Oregon were 32% to 61% of total catch by weight (Hannah and Jones 2007). A study conducted by the Oregon Department of Fish and Wildlife (ODFW) indicates that BRD use resulted in a 66% to 88% reduction in total fish bycatch (Hannah and Jones 2007). Additionally, mandatory use of BRDs has altered the species composition of bycatch from larger, commercially important species to smaller sized species with little to no commercial value, reducing the economic incentives for higher bycatch levels. While there are limited bycatch data from California prior to 2004 it is thought that, given the similarities between the fleets, the California fleet may have experienced reductions in bycatch similar to the Oregon fleet.

Several types of BRDs may be used in the California fishery, including the rigid-grate excluders, soft panel excluders, and fisheye excluders. However, rigid-grate BRDs are generally considered to be the most efficient in reducing fish bycatch with minimal pink shrimp loss (Figure 3-1). The majority of active vessel operators in both California and Oregon have been using this type of BRD since 2003.

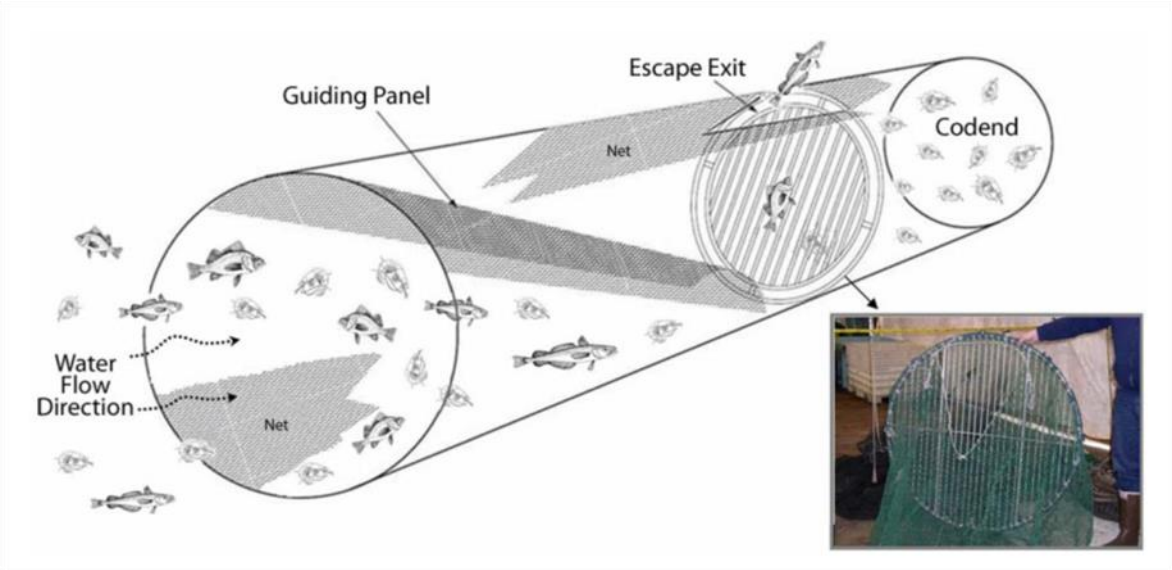

Figure 3-4. Diagram and photo of a rigid-grate bycatch reduction device (BRD) used in the pink shrimp fishery. Credit: Robert Hannah, ODFW.

A study evaluated whether modifications can be made to gear to further reduce bycatch of eulachon. An experimental footrope, modified by removing the central one-third of the trawl ground line, reduced eulachon bycatch by 33.9%. It also reduced bycatch of slender sole (*Lyopsetta exilis*), other small flatfishes, and juvenile darkblotched rockfish by 80% or more without significantly reducing the efficiency of the gear with respect to pink shrimp (Hannah et al. 2011).

Recent research by ODFW and Pacific States Marine Fisheries Commission (PSMFC) indicates that attaching inexpensive green LED lights on nets reduced eulachon catch by 90.5% and juvenile rockfish catch by 78%, with negligible impacts on shrimp retention (Figure 3-2; Hannah et al. 2015). This research suggests that bycatch of sensitive species might be avoided by easy and cost-effective gear modifications to include these footrope lighting devices (ODFW 2014d). Shrimpers in Oregon voluntarily embraced the use of FLDs lights in the second half of the 2014 season. With strong support from the industry, use of FLDs became mandatory for both Oregon and Washington vessels beginning in 2018. This effective, low-cost solution to address eulachon bycatch is currently being used voluntarily in California and regulations requiring FLD use will be proposed in connection with this FMP.

a) b)

Figure 3-5. Eulachon bycatch in pink shrimp trawls a) not equipped with LED lights and b) equipped with LED Lights. Credit: NOAA 2014

A PSMFC and ODFW study sought to identify whether altering the level of illumination (through increasing the number of LED lights) along the footrope further reduced bycatch of eulachon in shrimp trawls (Lomeli et al. 2018). Increasing the amount of illumination (5, 10, or 20 LED lights) did not significantly affect the catch ratio of eulachon between the 3 illumination treatments. Similar to Hannah et al. (2015), Lomeli et al. (2018) concurred that illuminating a footrope with LED lights significantly reduced eulachon bycatch compared to an unilluminated footrope (81%, 60%, and 47% for 5, 10, and 20 LED lights configurations, respectively).

More recently, ODFW and PSMFC tested whether FLDs alone, without the use of a codend rigid-grate BRD, was sufficient to reduce bycatch of eulachon and other species (Lomeli et al. 2019). While FLDs alone were sufficient to reduce bycatch of eulachon and yellowtail rockfish without the use of the BRD, their results clearly demonstrated that rigid-grate BRDs are still necessary to exclude several other species of fish that are not affected by FLDs. The result of these studies suggest that the environmental impacts of shrimp trawling can be reduced, especially for eulachon bycatch.

Pink shrimp vessels are subject to restrictions for incidental catches of federally managed groundfish. Shrimp vessel operators are allowed to retain and sell commercially valuable species, assuming they possess the appropriate permits. However, to prevent excessive take of groundfish species, pink shrimp vessels are allowed to land up to 500 lb of groundfish per day for each day of the trip, provided that they do not land more than 1,500 lb per trip (NWFSC 2010).

Rockfish Conservation Areas (RCAs) are large depth-based area closures implemented in 2002 to protect rebuilding groundfish stocks. Pink shrimp trawling is permitted in the non-groundfish trawl RCA when a valid declaration report has been filed with the National Marine Fisheries Service (NMFS) Office of Law Enforcement. Groundfish caught with pink shrimp trawl gear may be retained and are subject to the limits outlined in regulations (https://www.fisheries.noaa.gov/west-coast/sustainable-fisheries/west-coast-groundfish-closed-areas).

3.1.3.2.5 Legality of bycatch and seabird and marine mammal gear interactions

There have been no significant interactions identified between the pink shrimp fishery and threatened or endangered birds or mammals (Roberts 2005; MSC 2007). The pink shrimp fishery is classified as Category III in the Marine Mammal Protection Act List of Fisheries (86 CFR 3028) with no observed or documented take of marine mammals.

3.1.4 Habitat

3.1.4.1 Description of threats

Benthic trawling, in which fishing gear is dragged along the bottom of the ocean, can be detrimental to a variety of habitats. Relatively stable habitats, such as hard bottom and dense mud, experience the greatest changes and have the slowest recovery rates compared to less consolidated coarse sediments in areas of high natural disturbance (NRC 2002). Heavy trawling in mud habitats has been shown to decrease invertebrate density and diversity (Hannah et al. 2010). Soft bottom habitats are relatively resilient to trawl gear, but mud bottom habitats may have longer recovery times than soft bottom habitats with larger sediment (NRC 2002, Hannah et al. 2010). The estimated recovery time in the absence of continued trawling is estimated to be one year for shrimp habitat (NMFS 2005). A recent study comparing invertebrate densities in closed areas between 2007 and 2013, corresponding to the year following the closure of the fishery and five years of recovery, respectively, found that invertebrate recoveries varied by species and by site (ODFW 2014b). Sea whips, which were the dominant structure-forming macro-invertebrates in the areas surveyed, had increased markedly in density, though it was estimated that it would take another decade to achieve an unfished size structure (ODFW 2014b).

The PFMC and NMFS recently evaluated changes to EFH for the Pacific coast groundfish fishery (NMFS 2019). The environmental impact study indicated that habitat impacts by bottom trawl gear in areas where pink shrimp trawling occurs

is rated between 0.5 and 1, which is the lowest sensitivity classification for impacts to seafloor habitat by bottom trawl gears. Additionally, the semi-pelagic trawl gear used is likely to have less impact on bottom habitats than other trawl gear and is considered less damaging than gear used in other cold water shrimp fisheries (Roberts 2005).

In most cases, trawling can be extremely detrimental to sensitive species such as corals. Corals are known to occur in California waters, including within and adjacent to the area that formerly made up the PSTG. Six major taxa of coral or coral-like species documented within the PSTG include hydrocorals (order Stylasterina), black corals (order Antipatharia), stony corals (order Scleractinia), sea fans (order Gorgonacea), true soft corals (order Alcyonacea), and sea pens (order Pennatulacea; CDFG 2007). However, these species are primarily found on hard bottoms, which pink shrimp trawlers avoid. Since 2008, no trawling has been allowed in state waters.

3.1.4.2 Measures to minimize any adverse effects on habitat caused by fishing

The MLMA requires the minimization of adverse effects on habitat from fishing activities. The prohibition of pink shrimp trawling in state waters was enacted in part to remove the potential for adverse habitat impacts in nearshore shrimp beds.

3.2 Requirements for person or vessel permits and reasonable fees

The CCR describes the permits required to fish in California waters. Fees are current as of July 2021:

- Commercial Fishing License—All Pink Shrimp fishermen must have a commercial fishing license and a vessel permit. Commercial Fishing Licenses are $153.73 for residents and $453.50 for non-residents, and is required for any person 16 years of age or older who uses or operates or assists in using or operating any boat, aircraft, net, trap, line, or other appliance to take fish for commercial purposes, or who contributes materially to the activities on board a commercial fishing vessel.

- Commercial Boat Registration—The commercial boat registration fee is required for any resident owner or operator of any vessel operated in public waters in connection with fishing operations for profit in the state, and is $398.75. Non-resident commercial boat registration is $1,181.50.

- Pink Shrimp Permit—Fishermen need to have a permit specific to pink shrimp. There is only a single permit for the southern region, but there are a number of different types of permits for the northern region due to the limited access program (Table 3-3).

All fees include a nonrefundable 3% application fee.

Table 3-3. List of fees for pink shrimp trawl vessel permits as of July 2021.

Permit	Fee (US dollars)
Northern Pink Shrimp Trawl Vessel Transfer Fee (New Owner)	$1,000.00
Northern Pink Shrimp Trawl Vessel Transfer Fee (Same Owner)	$200.00
Northern Pink Shrimp Trawl Vessel Transfer Fee (Temporary)	$100.00
Northern Pink Shrimp Trawl Vessel Permit Fee (Transferable)	$1,573.00
Northern Pink Shrimp Trawl Vessel Permit Fee (Nontransferable)	$791.00
Southern Pink Shrimp Trawl Permit Fee	$48.41

4. Monitoring and essential fishery information

4.1 Description of Relevant Essential Fishery Information

For essential fishery information for pink shrimp, see Section 1.1, Natural history.

4.2 Past and ongoing monitoring of the fishery

4.2.1 Past monitoring

The fishery developed in the early 1950s after Department research cruises found pink shrimp beds that could support a commercial fishery. Historically, the Department conducted extensive research on the pink shrimp fishery, including development of population models and establishment of a dockside biological market sampling program. Data collected on research cruise surveys were used to estimate shrimp population sizes, mortality rates, and growth rates. Research cruises were conducted from 1959 to 1968, but were discontinued due to the cost (Gotshall 1972; PFMC 1981). Population models were developed by Department statisticians to estimate recruitment, spawning stock abundance, and set catch quotas from 1969 to 1976. However, the models were subsequently discontinued because the exploitation rate for age-one shrimp, which typically constitute most of the spawning stock, was determined to be low and therefore able to be managed without a quota (Geibel and Heimann 1976; PFMC 1981). In more recent years, the proportion of age-one shrimp can

be very high but high catch of age-one shrimp does not seem to have negative effects on the population.

Population models were also found to be unreliable due to variable recruitment, growth, and natural mortality rates associated with pink shrimp (Hannah 1999). The dockside biological market sampling program provided data on pink shrimp size, sex, age composition, and count-per-pound, but this program ceased in 1992 due to a lack of available staff and resources. Essential fishery information on California pink shrimp was consistently collected from the 1960's through the 1980's.

Reports on the trends and status of the California pink shrimp fishery were also published on nearly an annual basis by the Department from 1959 to 1992 and California Cooperative Oceanic Fisheries Investigations Reports from 1984 to 1992. The PSMFC published six brief summaries of the fishery (1992–95; 1999–2000). Other published documents include Collier and Hannah (2001) and Frimodig et al. (2009).

4.2.2 Ongoing monitoring

Monitoring information currently collected by the Department includes logbooks and landing receipts. Trawl logbooks are a mandated requirement for fishermen to record start and end haul locations, time, depth, and duration of trawl tows, total catch by species market category, gear used, and information about the vessel and crew. Trawl logs are submitted on paper and entered into an electronic database. The Department has assigned staff to ensure that the log database is up to date.

Fishery managers and enforcement officers used state-issued landing receipts, referred to as fish tickets, to monitor fishery landings. Fish ticket data was transferred to the Pacific Fisheries Information Network regional database system by state fishery agencies in Washington, Oregon, and California. Beginning in 2018, these data are entered directly by seafood buyers into "E-Tix", an electronic database maintained by the PSMFC and accessible by Department staff through MLDS. Data collected by fish tickets include:

- weight of the finfish or shellfish landed by market category (general groupings of fish that are not species-specific)
- price paid to the fisherman by market category
- date the fish was landed
- type of gear used to harvest the fish

- port of landing
- commercial fishing block where the fish were harvested

California's data collection protocol previously also included dockside market sampling for biological data and count-per-lb. However, the work was redirected in the early 1990s to other higher priority needs. In 2018, the Department enlisted help from processors to start a dockside market sampling program with the goal of incorporating data from pink shrimp caught and landed in California with Oregon and Washington pink shrimp sampling programs to create a coast-wide evaluation for the species and determine if there are any differences in the shrimp population along the coast.

Port sampling of landings provides an excellent opportunity to collect information on the count-per-lb, sex ratio, reproductive status, and size and age distribution of the catch. Department staff have renewed efforts to maintain a database of current logbook data and to input backlogged information.

Data on a number of environmental conditions are already tracked. These data will be used to perform a correlation analysis similar to that conducted by Hannah (2010) to determine if pink shrimp recruitment in northern California exhibits the same environmental relationships as the stock in Oregon. Until a sufficient time series of these data are available, Department staff will utilize catch per trip data on landing receipts to produce a CPUE in place of more detailed log data.

4.2.3 Fishery-independent data collection

At-sea surveys were conducted by the Department between 1959 and 1969 to obtain abundance estimates for the various commercial beds and set regional quotas. These surveys were discontinued due to costs (Hannah 1999) and it is unlikely similar surveys would be conducted in the future.

5. New conservation and management measures

The Department intends to manage the pink shrimp fishery utilizing an HCR based on target and limit reference points developed by ODFW (MRAG Americas 2018; ODFW 2014c) and adopted by the Washington Department of Fish and Wildlife (WDFW). Both states have incorporated these reference points into their pink shrimp FMPs (ODFW 2018b; WDFW 2017). Use of these reference points by California would ensure uniform coastwide management of this fishery. Uniform management is preferable because states only have jurisdiction over shrimp landed within that state and not the origin of catch by state for shrimp.

5.1 Limitations on fishing for target species

All previous limitations on fishing for the target species continue to apply (see Sections 3.1 and 3.2).

5.2 Overfishing criteria and measures

Developing overfishing criteria and measures for pink shrimp is difficult due to high interannual variability in biomass, lack of a known stock-recruit curve, and lack of a fishery-independent stock assessment. To develop a framework for precautionary management, ODFW developed a HCR and a set of target and limit reference points which were designed to strike a balance between economic opportunity and resource sustainability (ODFW 2014c).

Given the short life span of pink shrimp, ODFW determined that environmental variation and same year recruitment are important factors for determining spawning stock biomass. In particular, ODFW found that environmental effects on recruitment appear to have a greater influence than variation in spawning stock. ODFW's HCR was developed to reduce fishery impacts on egg-bearing females whenever there is evidence that spawning biomass is low.

The average pounds landed per trip during the month of June (June catch per trip) was found to serve as a reasonable proxy for spawning stock biomass in a given year. Age 1 shrimp enter the fishery in June and catch per trip serves as an indicator of year class strength. Using catch-at-age data to conduct a virtual population analysis, ODFW determined that during the periods of lowest observed spawning stock biomass in the strong El Nino years of 1983 and 1998, June catch per trip fell below 7,500 lb. Stocks at that level rebounded rapidly with the return of favorable environmental conditions. To account for increased efficiency of the fleet, and uncertainty in environmental and stock dynamics, ODFW adopted a 10,000 lb June catch per trip limit reference point to manage the fishery. Further, they adopted a 12,500 lb target reference point for to

provide additional protection for the stock given the uncertain effects of climate change on the spawning dynamics of the stock (ODFW 2018b).

ODFW also determined environmental conditions during the larval stage are a good predictor of stock status during the following season (Figure 5-6; ODFW 2014c). The sea level height (SLH) in Crescent City during April of the previous year to January of the current year, when larvae are typically present in the environment, is used as a proxy for preseason stock status. ODFW found that April-January SLH of 7.5 ft or greater correlated with poor recruitment events in 1983 and 1998. The limit reference point is triggered when this environmental condition is met and the June catch per trip is below 10,000 lb. In this case the fishery is closed as soon as practical, and the opening of the next season is delayed until April 15. The target reference point is triggered regardless of environmental conditions and results in the season closing on October 15 and delays the start of the next season to April 15. Both measures are intended to provide added protection for egg bearing females and prevent the stock from falling below the lowest previously observed spawning stock biomass.

When the adoption of Oregon's reference points was discussed at an industry-wide online meeting, members of the California pink shrimp fleet were concerned that a higher proportion of smaller sized and single-rigged vessels in California could cause unwarranted closures and seasonal adjustments. To address these concerns the Department examined historical landings and compared June catch per trip from 1975 - 2019 to examine impacts if the Oregon HCRs had been in effect (Appendix A – Pink Shrimp Harvest Control Rule Analysis). The analysis found that fishery trends for California were similar to those of Oregon and Washington and the HCRs would be suitable for California. The analysis concluded that the HCRs would not have produced any closures or adjustments after the early 2000s and a correction factor of 1.6 should be applied to June catch per trip landings for single-rigged vessels (Table 5-1; Figure 5-2; Appendix A). Applying the correction factor made single-rigged effort comparable to double-rigged effort and allowed for greater consistency in evaluating trends in the fishery, as ODFW developed the HCR based on the catch of a fleet largely composed of double-rigged vessels.

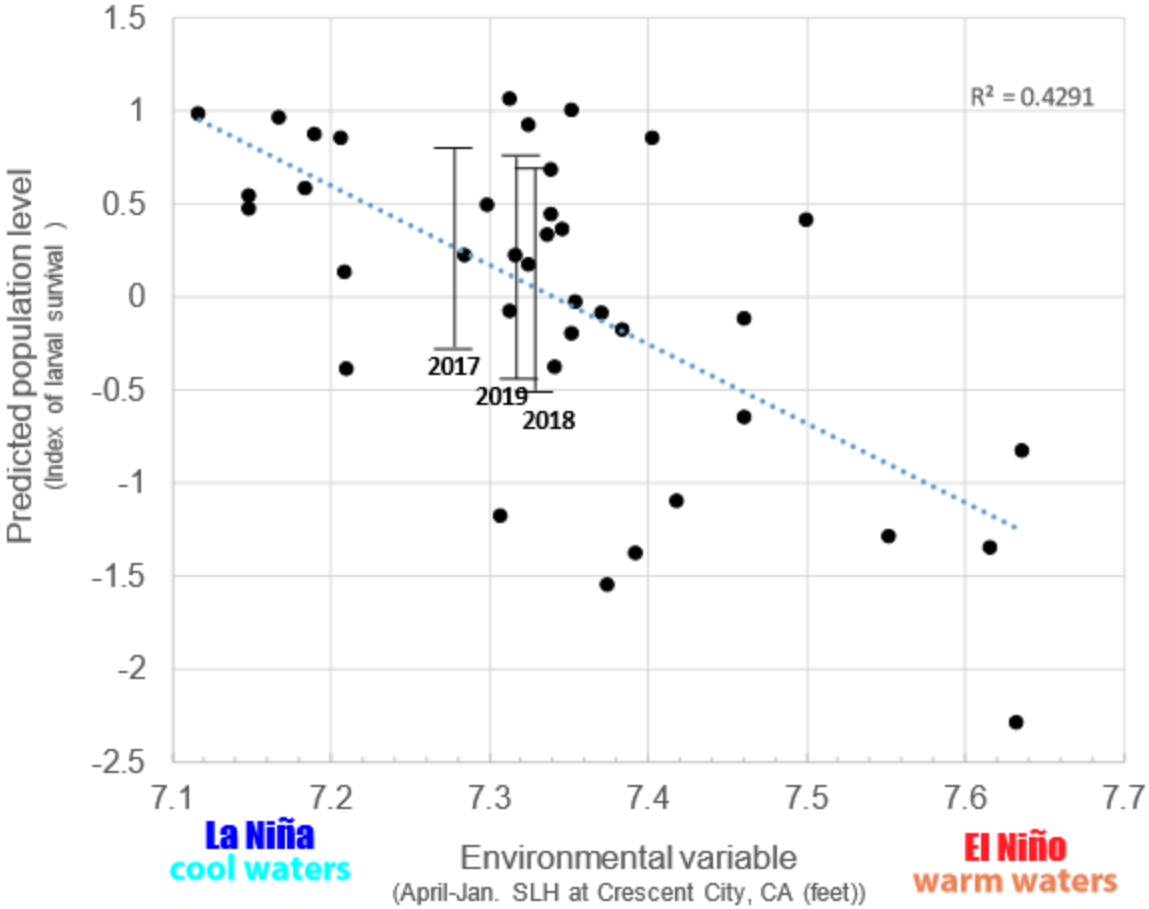

Figure 5-6. Predicted pink shrimp population level compared to average April-January sea level height at Crescent City, CA. Reproduced from ODFW 2020.

Table 5-1. Target and limit reference points for the California pink shrimp trawl fishery based on reference points developed for Oregon.

June Avg. shrimp catch/trip	Current season will close	Following season will open
> 12,500 lb/trip	October 31	April 1
< 12,500 lb/trip	October 15	April 15
<10,000 lb/trip + Apr-Jan SLH > 7.5 ft	As soon as possible	April 15

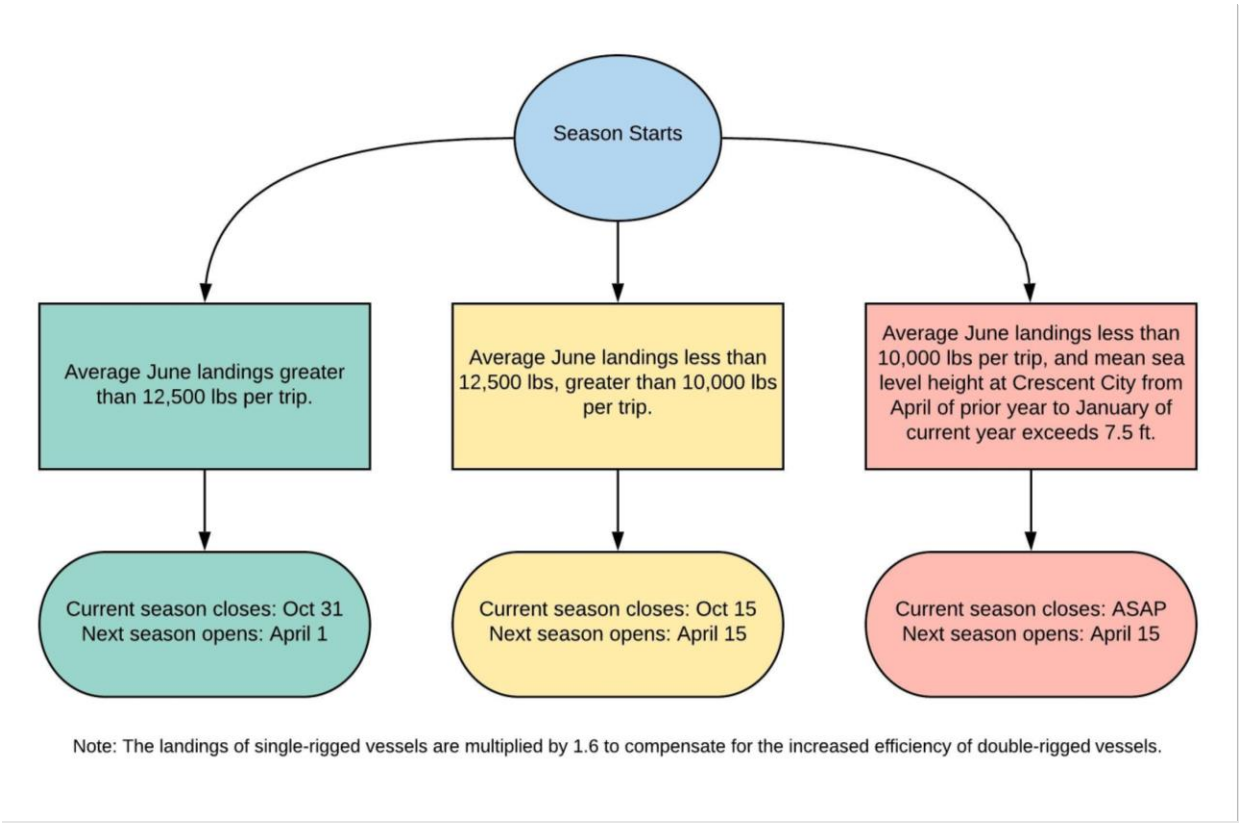

Figure 5-2. Flow chart of proposed harvest control rule for the California pink shrimp fishery.

5.3 Measures to reduce unacceptable levels of bycatch

California will continue to require the use of BRDs, and is moving to require FLDs to be attached to trawl nets. For more information about the use of FLDs in the pink shrimp fishery, see Section 3.1.3.2.4, Measures to reduce bycatch.

5.4 Measures to minimize any adverse effects on habitat caused by fishing

No additional measures have been taken to minimize adverse effects on habitat caused by the pink shrimp fishery. All state waters are closed to trawling and expanded federally designated EFH areas protect a substantial portion of the offshore environment. However, the effect of the pink shrimp fishery on habitat needs more study, especially if the opening of the state waters in the historical PSTG is to be considered in the future.

5.5 Creation or modification of a restricted access fishery

The northern pink shrimp restricted access fishery had a stated capacity goal of 75 transferable permits when it was created in 2001. The fishery currently has 39 permitted vessels (35 transferable, 4 non-transferable). Of these, 15 made

landings in California in 2019 and 5 in 2020 (MLDS 2020). Historical participation in the fishery was much higher, peaking at 315 permits statewide in 1994. Many of these vessels participated the groundfish fishery and left the fishery as revenue from groundfish dropped in the late 1990s into the early 2000's due to the overfished status of several key groundfish species around that time. The 2003 voluntary federal groundfish permit buyback removed about half of west coast trawl vessels, including 31 vessels holding Northern pink shrimp trawl permits. Though recent landings suggest the current capacity goals are too high, the implementation of this FMP may change the characteristics of the fishery. The fishery should be monitored, and changes in the capacity goals considered in the future if conditions warrant.

5.6 A procedure to establish and periodically review and revise a catch quota

The proposed management strategy does not include a catch quota. The new target and limit reference points based on average June catch per trip provide a more conservative management framework than the current strategy based only on maximum count per pound. These limits will be periodically reviewed and revised as necessary.

5.7 Requirements for person, gear, or vessel permit and reasonable fees

This FMP maintains all previous requirements for person, gear, or vessel permit and reasonable fees.

5.8 Developing consistency in management between states

The pink shrimp fishery is managed by states through the issuance of state-specific permits. Because the fishery primarily occurs in federal waters, these state permits act as a "landing" permit to allow only those permitted vessels to land in each state. Because a state is limited in its ability to restrict fishing activity in federal waters, it may be legal for a vessel to harvest pink shrimp in federal waters off the coast of a state where the pink shrimp season is closed and land the catch in a state where the fishery is open. This reduces the ability of the HCR to protect the stock when it is at low levels.

The independent steps states have taken towards a common management strategy, and a relatively homogenous stock from northern California to Washington reduce the likelihood of interstate conflict in the fishery. However, it is still possible that regional differences in stock dynamics could lead to single- or dual-state closures, and as ocean temperatures rise in the future, California pink shrimp populations could be more adversely affected making closures more likely than in Oregon and Washington. Consultation between states will be

required to develop a solution to further reduce the likelihood of interstate conflict and ensure the sustainable and equitable management of the stock.

5.9 Establishing accurate weights

California FGC § 8043 and CCR Title 14 §197 require fish businesses to record the accurate weight of catch received on a landing receipt. Pink shrimp is landed mixed with ice, and historic reported landings have been inconsistent, either reporting a combined weight of ice and shrimp, or a calculated net weight of shrimp based on ice weight estimated from sampling the catch at the time of landing.

The HCR relies on an accurate reporting of catch per trip, and so requires a consistent method of measuring and reporting catch. Fleet members and processors are concerned that deicing shrimp prior to weighing would cause product degradation, so the preferred pathway is to codify a method of estimating the net weight of shrimp landed. Oregon and Washington have established similar methods to compute net landing weights, and adoption of such a method in California would further standardize the management of the stock between the three states. This net weight is intended to satisfy the accurate weight requirements of FGC §8043 and CCR Title 14 §197. Implementing regulations in CCR Title 14 will prescribe a procedure to estimate the percentage of ice in landings and report the net weight of shrimp landed.

5.10 Implementation

Implementing this FMP will require the Commission to adopt the FMP, and then regulations implementing the changes described in the FMP. Staff will be needed to work with processors to implement weighing procedures. Ongoing outreach and education about the new requirements with the fleet will continue. Staff time will be needed to monitor landings each June and evaluate whether the fishery is meeting the reference points prescribed by the HCR, or if an in-season modification or closure is warranted. If implementation of the HCR leads to sustainable certification of the fishery by MSC, a portion of shrimp caught in California waters but currently landed in Oregon may be landed at California ports in the future. The greater volume of shrimp may require increased staff time to conduct biological sampling and verify the count-per-pound limit is not being exceeded. Additionally, staff will periodically review the performance of the HCR and provide updates to the Commission.

5.11 List of inoperative statutes

This FMP will render the following section of the California FGC inoperative, as applied to only the pink shrimp fishery, once the implementing regulations are in place:

§8842 (b). Trawling for shrimps or prawns shall be authorized only in those waters of Districts 6, 7, 10, 17, 18, and 19 that lie not less than three nautical miles from the nearest point of land on the mainland shore, and all offshore islands and the boundary line of District 19A, except that in waters lying between a line extending due west from False Cape and a line extending due west from Point Reyes, trawling is allowed not less than two nautical miles from the nearest point of land on the mainland shore until January 1, 2008.

Rendering this statute inoperative and replacing it with a clear prohibition in CCR Title 14 removes ambiguity about the legality of pink shrimp trawling in state waters, and clarifies that prior to the authorization of any pink shrimp trawling in state waters, the standards specified in 8842 (d) must be met.

6. Anticipated effects of additional management measures

6.1 On fish populations

The additional management measures are expected to result in a more precautionary management for the pink shrimp fishery by providing a mechanism to close the season early if target or limit reference points are met. The addition of FLDs to trawls is expected to decrease finfish bycatch, especially of eulachon.

6.2 On habitats

Further research is needed on the habitat impacts of pink shrimp trawling, particularly if re-opening the PSTG is to be considered. Methods for assessing habitat impacts could include cameras on trawl gear, remotely operated vehicle camera surveys, and grab samples across gradients of trawl effort. Partnerships among fishermen, the Department, academics and conservation organizations could produce a more efficient and effective research program.

6.3 On fishery participants

Fishery participants will benefit from consistency of regulations across Oregon, Washington, and California. Consistent regulations across the three states will be easier for participants to understand and will provide increased fairness and equity by aligning season open and close dates, as well as the biological reference points. Participants will also benefit from increased predictability of the fishery, allowing for more precise fiscal planning. The implementation of this

FMP will improve the chances for MSC Certification for the California pink shrimp fishery and an associated increased ex-vessel price, which has occurred in Oregon and Washington. Competitive prices for pink shrimp landed in California could, in addition to increasing gross ex-vessel revenue, decrease operating costs (shorter transit times and lower fuel/maintenance cost) and result in a greater net revenue for fishery participants.

6.4 On tribes and tribal communities, coastal communities, and businesses that rely on the fishery

Tribes and tribal communities, coastal communities, and businesses that rely on the fishery will benefit from greater consistency and predictability of the fishery. If the FMP results in MSC certification increased wholesale and ex-vessel price for pink shrimp could provide benefits to northern California coastal communities. In 2019, 7.3 million pounds of shrimp harvested off the coast of California, with an ex-vessel value of $5.4 million, was landed in Oregon (ODFW 2020). Yet few shrimp were landed in California despite the proximity between fishing grounds and northern Californian ports. Competitive prices brought on by MSC certification could increase landings in California and help re-start processing in-state, which would directly benefit fishery reliant businesses and the economy of the coastal communities. A robust pink shrimp fishery in northern California would provide a reliable, consistent, and sustainable income source for these fishing communities that have lost revenue due to the decline and unpredictability in other fisheries, especially salmon and Dungeness crab. Diverse portfolios of sustainable fisheries may increase the resilience of these communities and their economies in the context of a changing climate.

7. Future management needs and directions

7.1 Identification of information gaps

The primary information gaps for the pink shrimp fishery are a lack of reference points that directly indicate overfishing or an overfished state instead of fishery-dependent proxies, and targets or timeframes for rebuilding should the fishery be deemed overfished. No stock assessment model or biomass-based reference points have been developed for the fishery due to the absence of an established stock-recruitment relationship. This has been addressed partially by the use of empirical metrics and an HCR but remains unresolved. The fleet's response to the implementation of measures described in this FMP is unknown, and the Department should monitor the fishery closely as it adapts to the new management regime and identify areas of interest for future research and monitoring.

The response of pink shrimp to climate change is unknown, and catch should be monitored, and appropriate changes to the fishery made, if current management measures are not sufficient in protecting the stock from decline.

7.2 Research and monitoring

Biological sampling of pink shrimp caught in California waters was initiated in 2018. Data on shrimp size, age, sex, and reproductive condition will be shared with Oregon and Washington biologists to assess stock-wide patterns. Collaborative monitoring can be used to improve forecasts of future catches, as well as potential changes in correlations between stock biology and environmental conditions that may occur with changing climate.

Pink shrimp trawl vessels can travel widely between fishing grounds and landing ports across states and many vessels are permitted to land in more than one state. In recent years, more pink shrimp harvested from federal waters off California are landed into Oregon ports than into California ports. Department and ODFW biologists currently share information from logbooks to track these cross-border landings. Improved data sharing on a more frequent basis could help both states to better understand interactions between effort, capacity, and stock dynamics.

7.3 Considerations related to future management changes

The Department will monitor the performance of the new management framework. Annual catch, participation, size, age, and sex information will be analyzed to evaluate the sensitivity of the HCR, and amendments to the HCR will be considered if it appears to be insufficient in protecting the stock, or if it is oversensitive and unduly reduces fishing opportunity.

The performance of the correction factor (1.6) for single-rigged vessels will also be evaluated. The correction factor should perform well if the corrected June catch-per-trip values for single-rigged vessels is similar to June catch-per-trip for double rigged vessels in the same landing port.

7.4 Climate readiness

California has historically relied on scientific studies conducted in Oregon and operated under the assumption that environmental conditions and stock health are similar in both states. The effects of climate change may alter the validity of that assumption, as the southern portion of the species range occurs off the California coast and therefore could be more likely to experience warm water conditions that negatively affect stock biomass. California may serve as an indicator and identify serious environmentally driven declines in the species before it affects the fisheries in Oregon and Washington. In addition, the

inclusion of environmental variables into the harvest control rule explicitly incorporates climate considerations into the sustainable management of the fishery.

8. Review and amendment procedures

8.1 Procedure for review and amendment of the plan

Review and amendment of the plan will be considered during the periodic updating of the pink shrimp ESR. Catch, catch per trip, and count per pound will be used to evaluate the health of the stock and performance of the management strategies described in this FMP. If the current management strategies are not sufficiently protecting the resource or excessively limiting fishing opportunity, strategies will be modified through a rulemaking, or an amendment of this FMP with associated implementing regulations.

8.2 Types of regulations that the Department may adopt without a plan amendment

An important component of this FMP is that it provides the ability to respond to changing conditions, both environment and market driven. The Department may implement regulations without an FMP amendment to address some of these changes, including regulations that: 1) manage fishery impacts to habitat, 2) manage bycatch in the fishery, 3) establish record keeping requirements, 4) provide for the orderly conduct of the fishery, and 5) facilitate market access. This specifically includes changes to the restricted access program, including modifying the capacity goals and permit cost. An FMP amendment would be required for changes to the HCR, as one of the objects of this FMP is to provide coastwide consistency in the pink shrimp fishery. Altering the HCR would substantially change how the fishery is prosecuted.

9. CEQA Compliance and the Anticipated Effects of Proposed Project and Alternatives

This document has been drafted to fulfill the Commission's obligation to comply with the California Environmental Quality Act (CEQA; Public Resources Code (PRC) §21000 et seq.) in considering and adopting an FMP. In general, public agencies in California must comply with CEQA whenever they propose to approve or carry out a discretionary project that may have a potentially significant adverse impact on the environment. Where approval of such a project may result in such an impact, CEQA generally requires the lead public agency to prepare an Environmental Impact Report (EIR). The document must identify all reasonably foreseeable, potentially significant, adverse environmental impacts that may result from approval of the proposed project,

as well as potentially feasible mitigation measures and alternatives to reduce or avoid such impacts. The law also serves to protect the environment and to foster informed public decision-making through public meeting and other transparency requirements.

Under CEQA, the Secretary of Resources is authorized to certify a state regulatory program as meeting certain environmental standards and providing a functionally equivalent environmental review to that required by CEQA (PRC §21080.5; see also 14 CCR §§15250- 15253). As noted by the California Supreme Court, "certain state agencies, operating under their own regulatory programs, generate a plan or other environmental review document that serves as the functional equivalent of an EIR. Because the plan or document is generally narrower in scope than an EIR, environmental review can be completed more expeditiously. To qualify, the agency's regulatory program must be certified by the Secretary of the Resources Agency. An agency operating pursuant to a certified regulatory program must comply with all of CEQA's other requirements" (Mountain Lion Foundation v. Fish and Game Comm. (1997) 16 Cal.4th 105, 113-114).

The Commission's CEQA compliance with respect to the Pink Shrimp FMP is governed by a certified regulatory program (14 CCR §§15251(b)). The specific requirements of the program are set forth in CCR Title 14 in the section governing the Commission's adoption of new or amended regulations, as recommended by the Department (CCR Title 14 §781.5). This FMP would function as an Environmental Document (ED), which contains and addresses the proposed Pink Shrimp FMP and reasonable alternatives to the proposed management framework, thus serving as the functional equivalent of an EIR under CEQA. As noted above, however, preparation of the ED is not a "blanket exemption" from all of CEQA's requirements (Environmental Protection Information Center v. Johnson (1985) 170 Cal.App.3d 604, 616-618; see also Wildlife Alive v. Chickering (1976) 18 Cal.3d 190). Instead, the Commission must adhere to and comply with the requirements of its certified program, as well as "those provisions of CEQA from which it has not been specifically exempted by the Legislature" (Sierra Club v. State Board of Forestry (1994) 7 Cal.4th 1215, 1228).

For purposes of CEQA and this ED, the proposed project consists of the adoption of the Pink Shrimp FMP and by extension the resulting management actions based on the FMP, as outlined in Chapter 5. The various alternatives will be described including the stated policies, goals, and objectives of FMPs under the

MLMA. The Pink Shrimp FMP will continue to be managed through ongoing oversight and management of the fishery by the Commission.

9.1 Scoping and Tribal Consultation Processes

As discussed above, the MLMA calls for meaningful constituent involvement in the development of each FMP. In addition, CEQA requires public consultation during lead agency review of all proposed projects subject to a certified regulatory program (PRC §21080.5 (d)(2); 14 CCR §781.5). The adoption of the Pink Shrimp FMP and its associated implementing regulations is such a project under CEQA. In addition to the requirements of the MLMA, CEQA requires public consultation on all environmental projects. The Department accomplishes this through a public comment period, scoping sessions within the communities involved, and at least two Commission meetings.

On October 4, 2021, the Commission, with support from the Department, prepared and filed a Notice of Preparation (NOP) and an Initial Study (IS) with the State Clearinghouse for distribution to appropriate responsible and trustee agencies for their input and comments. Further, the notice was provided to individuals and organizations that had expressed prior interest in regulatory actions regarding Pink Shrimp. On behalf of the Commission, the Department held a scoping meeting on October 21, 2021. Appendix C contains a copy of the notices and an IS draft updated with an addendum to reflect developments since the IS' original publication. No substantive comments were received during the scoping period.

Pursuant to the Department's Tribal Communication and Consultation Policy, the Department initially informed tribes that an FMP for Pink Shrimp was being developed in a letter dated July 15, 2021. The Department received a written request for additional information from the Rincon Band of Luiseño Indians on August 6, 2021, to learn more about the project. On August 31, 2021, Department staff met with tribal representatives to provide an overview of the FMP and rulemaking components, and to answer questions from the representatives about the proposed project.

Pursuant to CEQA §21080.3.1, the Department and Commission also provided a joint CEQA notification to tribes in California. The letters to the individual tribes were mailed on October 22, 2021.

9.2 Public Review and Certification of the Environmental Document

The Commission's certified regulatory program and CEQA requires that a draft ED be made available for public review and comment (CCR Title 14 §781.5(f); PRC §21091). Consistent with these requirements, and upon filing the draft Pink Shrimp FMP with the Commission and with the State Clearinghouse at the governor's Office of Planning and Research, the ED will be made available for public review and comment for no less than 45 days. During this review period, the public is encouraged to provide written comments regarding the draft ED to the Commission at the following address:

California Fish and Game Commission
P.O. Box 944209
Sacramento, California 94244-2090

Additionally, oral testimony regarding the proposed Pink Shrimp FMP and the draft ED will also be accepted by the Commission at the public meetings announced. Public notice of the Commission meeting will be provided as required by the FGC.

The state is required by law to prepare written responses to all comments on the ED and proposed Pink Shrimp FMP received during the public review period that raise significant environmental issues (14 CCR §781.5(h); PRC §21092.5). In some instances, written responses to comments may require or take the form of revisions to the draft ED. Any such revisions, along with the Department's written responses to comments raising significant environmental issues shall constitute the final ED. The Commission will consider the final ED at a public hearing scheduled for April 20, 2022. Public notice of the Commission meeting will be provided as required by CEQA and the FGC. Notice of any final decision by the Commission regarding the ED will be provided to the extent required by law.

9.3 CEQA Analysis of Management Action and Alternatives

Per CEQA, an ED should consider reasonable alternatives that meet most or all of the project's objectives; substantially avoid or lessen the proposed project's potentially significant negative effects; be feasible to implement based on specific economic, social, legal and/or technical considerations; and foster informed decision making and public participation. Likewise, the regulations governing the Commission's certified regulatory program require that the Department's recommendations contain reasonable alternatives to the proposal (14 CCR §781.5(a)). This document will focus on three alternatives: no action, the proposed project, and Alternative A (Conservative HCR). The three

alternatives selected for evaluation represent a reasonable range of alternatives that would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the potentially significant effects of the project. Pursuant to the IS developed during the scoping process for the proposed project, the only potentially significant environmental impact identified is to biological resources. Thus, this section provides a comparison of the potential impacts to biological resources between the proposed project and each alternative.

9.3.1 Potential Environmental Impacts of the Proposed Project

Overall, the proposed project is not anticipated to have any significant impacts on the environment. Additionally, implementation of the proposed project is expected to benefit natural resources held in trust for the people of California when compared to existing conditions. More importantly, the proposed project is consistent with the MLMA and management measures currently in place in Oregon and Washington, which would ensure management uniformity along the West Coast.

9.3.1.1 Effects to Pink Shrimp Population

This FMP is not anticipated to cause any significant impact to the health of the pink shrimp population. While the pink shrimp stock will continue to be subject to fishing pressure, there is no anticipated change to overall fishing effort. As shown in Figure 2-7, despite ongoing fishing pressure following significant decline in landings during the late 1990s, the stock managed to recover, and landings rebounded back to 15-20 million lb/year range by early 2010s. This reinforces the current understanding of the species' robust and highly stochastic population level as described in Chapter 1.

Furthermore, any impact the proposed project may incur on the population would benefit the resource. If the HCR is triggered, the season would be shortened to preserve the stock and render more protection to it than there otherwise would be under existing management measures. Ultimately, the target and limit reference points in the HCR are set at levels anticipated to ensure recovery of stock if needed, buffer against uncertainty in the future due to climate change scenarios and support higher performance in terms of long-term stock health.

9.3.1.2 Effects on Habitats

As noted earlier in Chapter 3, pink shrimp trawl gear is one of the least environmentally impactful trawl gear types. Shrimp trawling also only takes place over soft-bottom habitats, where sensitive species such as hydrocorals do not exist. More crucially, part of the proposed project would clarify that shrimp trawling within state waters remains prohibited, which is expected to reduce the level of unintended disturbances to bottom habitats in that area. Any impact the proposed project may have on bottom habitat compared to status quo would thus be positive.

9.3.1.3 Effects on Sensitive Species

As provided in Chapter 3, the current level of eulachon bycatch is not considered to be contributing significantly to eulachon mortality on the West Coast. Furthermore, the proposed project, which would require the addition of LED lights to the trawl's footrope, is expected to reduce eulachon bycatch, in addition to other groundfish species.

9.3.2 Potential Environmental Impacts of the No Project Alternative

The No Project Alternative is the existing regulations governing the pink shrimp fishery at the time of the development of this FMP. The fishery would continue to be subject to a seasonal closure from November 1 through March 31, a minimum trawl net mesh size of 1.38 inches, a maximum shrimp count per pound of 160 or less, and mandatory bycatch reduction device requirement.

The No Project Alternative would maintain a management framework that is not responsive towards stock fluctuations and adverse environmental conditions. It would also forego an opportunity to further reduce impacts on threatened eulachon. Furthermore, pink shrimp fishery management in California will remain disparate from the Oregon and Washington, which target the same stock. As such, the No Project Alternative would not serve the specific goals that this FMP is trying to accomplish, nor the larger goal of sustainable and responsible fishery management as prescribed under MLMA. The incongruent management of the pink shrimp stock between the states would continue to incentivize vessels to land their catch in Oregon ports, even when fishing occurs off the coast of California, thereby perpetuating what are likely inefficient operations.

The No Project Alternative is also less environmentally protective than the proposed project. It would not clarify the prohibition against shrimp trawling within state waters, which may increase the risk of nearshore habitat being

impacted by mistake. This alternative would also not include the additional eulachon bycatch reduction measures.

9.3.3 Potential Environmental Impact of Alternative A: Conservative HCR

Alternative A, which incorporates an environmentally more conservative HCR, was developed to explore the potential impact of a more restrictive framework. This alternative HCR would increase target and limit reference points by 2,500 lb, to 15,000 lb/trip and 12,500 lb/trip, respectively. It also removes a correction factor that multiplies the June catch/trip of single-rigged trawl vessels by 1.6 to make catch comparable to double-rigged vessels. Alternative A is more precautionary because it adopts a more conservative set of reference points, which would result in more frequent early closures and opening delays.

Even though the HCR under this alternative operates under a more restrictive set of reference points, it is unlikely to confer more benefit to the pink shrimp stock because the fisheries (CA, OR, and WA) occur in federal waters and target a single stock. Additionally, it is expected to further exacerbate recent trends in out of state landings and result in negative economic impacts on local communities by forcing pink shrimp vessels to land in states with MSC-certified fisheries and higher ex-vessel prices. Adopting more restrictive rules in California would simply drive the vessels to land in other states without conferring any concrete benefit to the pink shrimp stock.

Alternative A would also not meet the objectives of producing a year-to-year stable fishery and could trigger unnecessary management activity that would either curtail or shut down the fishery without necessarily any concrete conservation benefit. The reference points in the proposed project include a 2,500 lb/trip buffer above the low historical values recorded during the strong El Nino events of 1983 and 1998 to account for improvements over time in fishing vessel efficiency and environmental uncertainly (ODFW 2014c). After these periods of low biomass and catch/trip, the stock rebounded quickly, and by 2011 catch had returned to levels comparable to previous highs. Under Alternative A, the target refence point could have been triggered in 2016 and the season curtailed had single-rigged vessels made a larger proportion of landings during June of that year, even with shrimp biomass at the same levels.

Alternative A would retain the clarification of prohibiting shrimp trawling in state waters as well as the mandatory eulachon bycatch reduction measure. As such its impact towards the habitat and sensitive species would be similar to the proposed project.

9.3.4 Environmentally Superior Alternative

CEQA requires a lead agency to identify an environmentally superior alternative to the proposed project. The environmentally superior alternative would be Alternative A due to the more conservative reference points. However, in practice, unless all three states adopt a more stringent standard in unison, such rules would simply drive vessels to land in other states with less stringent rules, without yielding any concrete benefits. Furthermore, historical fishing data do not suggest that the more conservative set of reference points contemplated would be notably more effective at safeguarding the pink shrimp stock than the proposed HCR. Due to this, the proposed project is still the preferred project as it meets all the core program objectives while also not significantly effecting the environment.

9.4 Mitigation Measures

Fishing activities will result in the continued removal of a portion of pink shrimp from the population. However, the adaptive HCR and other safeguards prescribed by the proposed FMP are designed to ensure that removal of pink shrimp will not exceed sustainable levels. Moving forward, should the sustainability of the HCR come into question, Department staff will work with ODFW and WDFW staff to improve the management framework. Furthermore, the proposed project was developed in consultation with industry, which should lead to greater compliance with regulations.

Since no significant negative effect of this proposed project is expected on the pink shrimp population, and no significant effects are expected on the environment overall, mitigation measures are not provided to avoid or reduce significant effects. Pursuant to CEQA, the paragraphs above, together with the previously circulated Initial Statement, documents the Department's analysis of the possible effects the Department examined in reaching this conclusion (CCR Title 14 §15252(a)(1)(B)). As it stands, the proposed project is the preferred alternative as it meets all the core program objectives while also not significantly effecting the environment or limiting fishing opportunities.

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Appendix A: Pink (Ocean) Shrimp, Pandalus jordani: Harvest Control Rule Analysis

Pink shrimp, *Pandalus jordani*. (Photo credit: Scott Groth, ODFW)

California Department of Fish and Wildlife
Marine Region

May 2020

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Introduction to the California pink shrimp fishery

Pink shrimp (*Pandalus jordani*), also called ocean shrimp, is a commercially important species in California. Pink shrimp range from southeast Alaska to Baja California, but are only abundant enough to support a commercial fishery from Point Arguello to British Columbia (Hannah and Jones 2007). It is thought that a single genetic stock exists throughout their entire range (OST 2014). Pink shrimp are found at depths between 150 to 1,200 feet ft, but tend to be caught between 300 and 600 ft in California. They generally inhabit deep waters, aggregating near the bottom during the day in well-defined areas of muddy habitat and ascending into the water column at night to feed. Historically, most fishing occurred in federal waters, and since 2008 trawling for shrimp in state waters has been prohibited. They are protandrous hermaphrodites and typically spawn in March or April, recruiting to the fishery at age 1 as males, and transition to female at age 2. Their maximum life span is about three to five years, though most captured in the fishery are age 1 and age 2 (CDFW 2018), and they have been observed to have a very high annual natural mortality rate of about 0.96 (Martell et al. 2000).

The pink shrimp fishery is currently split into a northern and southern region, with Point Conception as the dividing line. Within the northern region, the primary pink shrimp beds have historically been located between Eureka and the Oregon border, and north of Fort Bragg. Additionally, commercially harvestable densities of pink shrimp are sometimes present off Morro Bay. In the southern region, pink shrimp are sometimes harvested along the mainland in the Santa Barbara Channel (CDFG 2007).

Pink shrimp are targeted via benthic trawl gear during the day when they are concentrated near the sea floor. Prior to 1974, only single-rigged trawlers (using a single trawl net) were used. After double-rigged trawlers entered the fishery, they comprised approximately 25% of the California fleet in the late 1970s, and increased to nearly 50% of the fleet during the 1980s and 1990s (CDFW 2018). Today, the majority of the fleet is double-rigged. Double-rigged vessels capture about 1.6 times the catch of a single-rigged vessel fishing under the same conditions for the same amount of time (PFMC 1981).

All shrimp trawl vessels are required to use bycatch reduction devices (BRDs), and the type of BRD used is influenced by the configuration of the trawl gear (CDFG 2007). Since 2002, BRDs have been required on all nets used in the pink shrimp fishery to protect overfished groundfish species (14 CCR §120.1). Several types of BRDs may be used in the California fishery, including rigid-grate excluders, soft-panel excluders, and fisheye excluders. However, rigid-grate BRDs are generally considered to be the most efficient in reducing fish bycatch with minimal pink shrimp loss. The majority of vessels in California and Oregon have been using this type of BRD since 2003.

California's pink shrimp fishery is currently managed using a suite of static regulations to promote the sustainability of the target species. Fishery participation is restricted in the north through a limited entry permit; participation in the south is unlimited and requires a southern permit. Regulations are identical in both regions and include:

- A seasonal closure from November 1 to March 31 to protect egg-bearing females.
- A minimum mesh size of 1.38 in (36 mm) to allow for escapement of small age 0 and age 1 shrimp.
- A prohibition on landing shrimp that exceed a maximum count-per-lb of 160. This is intended to prevent the excessive harvest of 1 yr old shrimp.

Additional protection for the species was provided in 2008 when pink shrimp trawl grounds in state waters were closed. Historically, these grounds accounted for about 10 percent of the total catch (CDFG 2007).

A joint application to the Marine Stewardship Council (MSC) for ocean pink shrimp fisheries in Washington and California was submitted in 2015 (MRAG Americas 2015). Washington was recommended for MSC certification, but California was not because it scored below 80 for Principle 3 (management system). The report identified weaknesses for Principle 3 which included 1) consultation processes are not well defined, and 2) management decision making is slow to respond to changing conditions. This new harvest control rule is being considered to address those deficiencies.

History of the Oregon pink shrimp fishery harvest control rule

The Oregon pink shrimp trawl fishery was the first shrimp fishery in the world to achieve certification by the MSC (Tavel Certification Inc. 2007). In order to maintain MSC certification a fishery must be periodically reviewed to determine if certification is still warranted. As part of the renewal process for the Oregon fishery in 2013, MSC requested additional information on stock status and current fishing effort to determine whether the fishery is being prosecuted at a sustainable level.

In response, ODFW developed a framework through which a precautionary management strategy could be evaluated for the pink shrimp trawl fishery. Included within this framework was a harvest control rule and a set of target and limit reference points which were designed to strike a balance between economic opportunity and resource sustainability (ODFW 2014).

Given the life history of pink shrimp, ODFW determined that environmental variation and same year recruitment are important in determining spawning

stock biomass. In particular, ODFW found that environmental effects on recruitment appear to have a greater influence than variation in spawning stock. ODFW's HCR was developed to reduce fishery impacts on egg-bearing females whenever there is evidence that spawning biomass is low.

The average of pounds landed per trip during the month of June (June catch per trip) was found to serve as a reasonable proxy for spawning stock biomass in a given year. Age 1 shrimp enter the fishery in June and catch per trip serves as an indicator of year class strength. Using catch-at-age data to conduct a virtual population analysis, ODFW determined that during the periods of lowest observed spawning stock biomass in the strong El Nino years of 1983 and 1998, June catch per trip fell below 7,500 lb. Stocks at that level rebounded rapidly with the return of favorable environmental conditions. To account for increased efficiency of the fleet, and uncertainty in environmental and stock dynamics, ODFW adopted a 10,000 lb June catch per trip limit reference point to manage the fishery. Further, they adopted a 12,500 lb target reference point for to provide additional protection for the stock given the uncertain effects of climate change on the spawning dynamics of the stock.

ODFW also determined environmental conditions during the larval stage are a good predictor of stock status during the following season. The sea level height (SLH) in Crescent City during April of the previous year to January of the current year, when larvae are typically present in the environment, is used as a proxy for the preseason stock status. ODFW found that April-January SLH of 7.5 ft or greater correlated with poor recruitment events in 1983 and 1998. The limit reference point is triggered when this environmental condition is met and the June catch per trip is below 10,000 lb while the target reference point is triggered regardless of environmental conditions.

If the target reference point is triggered, the current season is shortened and the following season is delayed. If the limit reference point is triggered, the fishery is closed as soon as possible, and the following season opens April 15 (Table 1). Both of these measures are done to provide added protection for egg bearing females and prevent the stock from falling below the lowest previously observed spawning stock biomass.

Table 1. Season closure and opening dates for the Oregon pink shrimp trawl fishery during a normal season, and when June catch per trip falls below the target and limit-based reference points.

June average catch/trip	Current season closes	Following season opens
> 12,500 lb/trip (normal season)	October 31	April 1
< 12,500 lb/trip (target)	October 15	April 15
<10,000 lb/trip + Apr-Jan SLH > 7.5 ft (limit)	As soon as possible	April 15

Consideration of ODFW HCR for use in California

Pink shrimp is a coastwide stock and the fishery predominantly takes place in federal waters. The ODFW HCR has already been adopted by the Washington Department of Fish and Wildlife (WDFW) and the Department has elected to evaluate the HCR for applicability to the California with the goal of providing consistent management strategies across the US portion of the stock.

To evaluate the ODFW HCR for use in Washington, WDFW staff compared landing trends between Washington and Oregon and found similar dynamics, inferring the fisheries were acting on a common stock and that the reference points specified in the HCR were appropriate for use in Washington (Wargo and Ayres 2017). This document presents a similar analysis, comparing trends in California to Oregon and Washington.

A key difference between the Oregon and California shrimp fleets is that the Oregon fleet is comprised nearly entirely of double-rigged vessels, while the California fleet has a mix of double- and single- rigged vessels. The ODFW developed the HCR based on the catch rates of double-rigged vessels, which are believed to be 1.6 times more efficient than single-rigged vessels (PFMC 1981). To determine if this holds true for the California pink shrimp fleet, a conversion factor of 1.6 was applied to the catch-per-trip of single-rigged vessels and compared to the catch of double-rigged vessels. The conversion factor would allow the Department to consider the landings of all vessel types when determining if the limit or target reference points have been triggered. This portion of the analysis was partially motivated by the concerns of the fleet that failing to correct for the landings of single-rigged vessels could trigger an unwarranted management action.

Results & discussion

Comparison of Historical Landings in California, Oregon, and Washington

To evaluate whether the fishery in California is acting on the same stock as the Oregon and Washington fisheries, we first compared total annual landings in the three states (Figure 1). Though the scale of the fisheries in each of the states is different, the dynamics in the landings in each state are consistent with what would be expected if a common stock exists across the three states. Most importantly, steep declines in catch were observed across the fisheries in strong El Nino years of 1983 and 1998, suggesting that stock biomass is regulated by the same environmental processes.

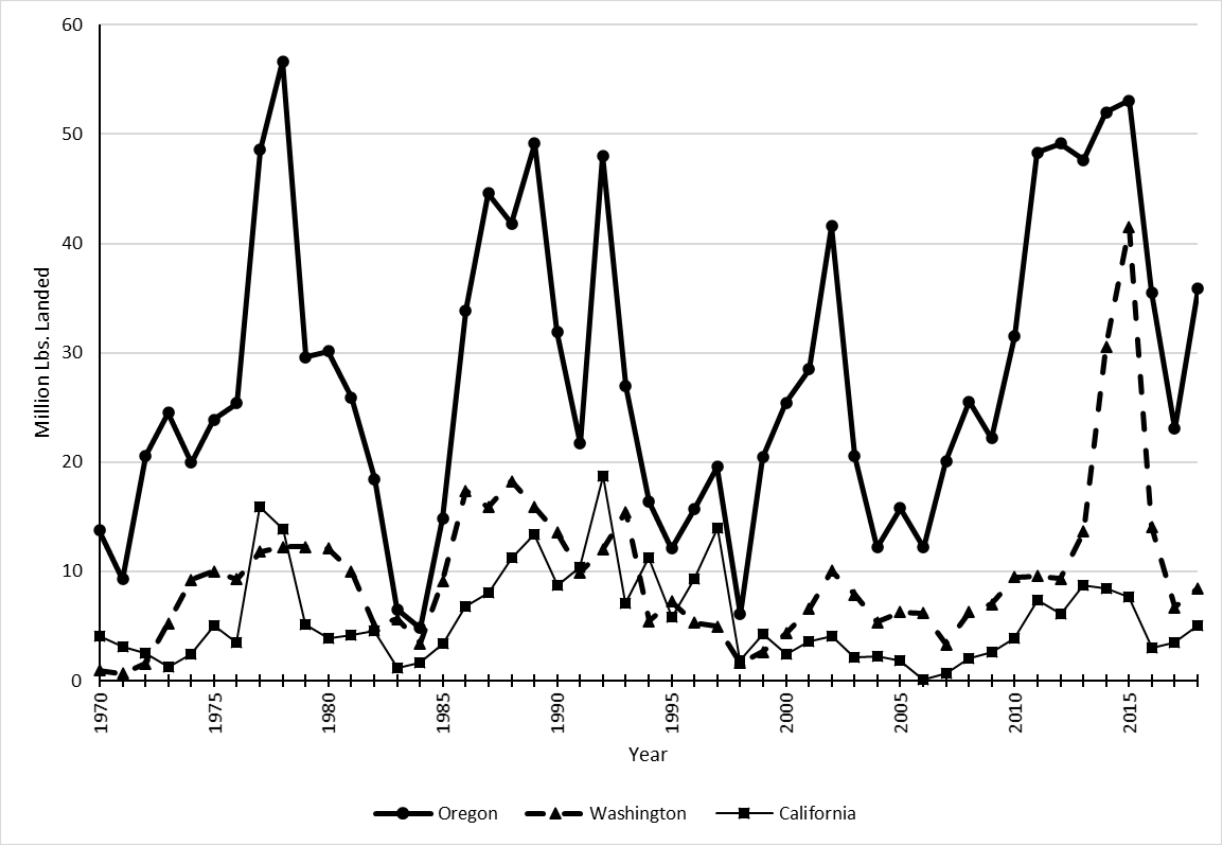

Figure 1. Pink shrimp landings in Washington, Oregon, and California from 1970-2018.

Having evidence that the pink shrimp population landed in California is contiguous with Oregon and Washington populations, but acknowledging overall landings are lower, we then wanted to confirm that the reference points used in Oregon and Washington are appropriate for the California fishery. To do this, we examined June catch per trip in the fishery from 1975 to 2019 (Figure 2). In the modern era of the fishery, where the fleet has decreased in numbers and transitioned primarily to double-rigged vessels (Table 2) outfitted with bycatch reduction devices (required since 2003), June catch per trip has consistently remained above levels which would trigger management action under the proposed HCR. This is consistent with the fishery in Oregon, where catch levels are above the reference points for the

same period. Critically, historical landings indicate the stock has been fished more intensively in the past and has been able to recover rapidly from periods of low biomass when favorable environmental conditions return. The implementation of this HCR would result in the fishery being managed more conservatively than in the past and would likely be sufficient to protect the stock in periods of poor environmental conditions while allowing for a robust fishery when the stock is healthy.

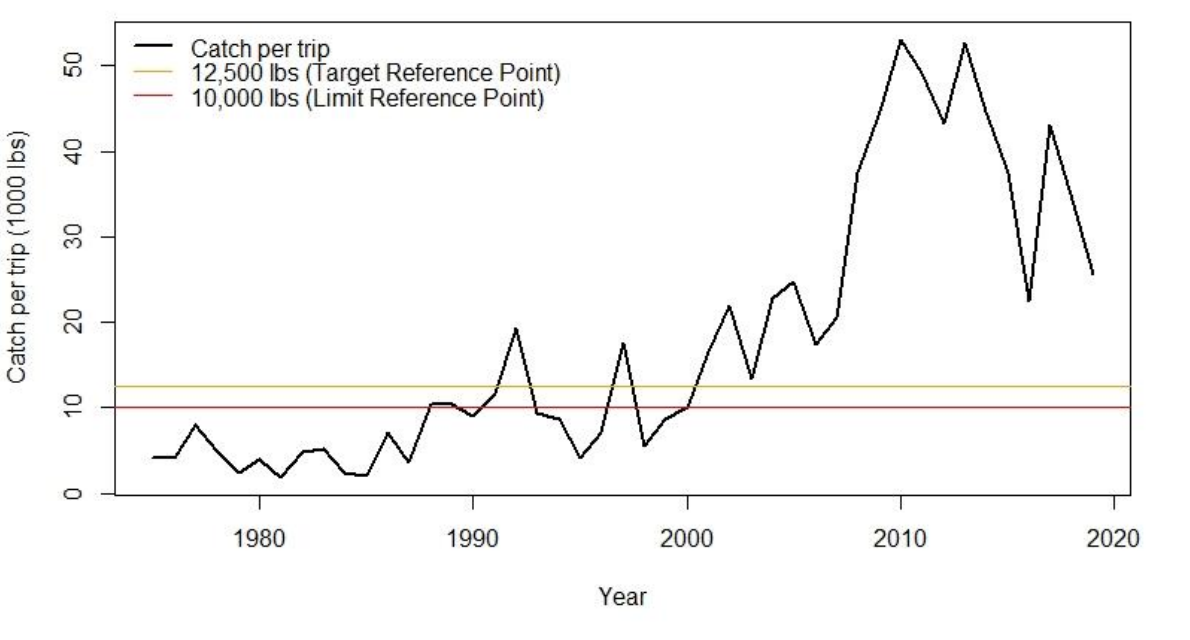

Figure 2. Average June catch per trip in the northern pink shrimp fishery from 1975-2019.

Table 2. Contributions of single-rigged (SR) and double-rigged (DR) trawl vessels in the northern California pink shrimp fishery in June. This table compares the number of vessels making landings (Avg N of Vessels), the percentage of the total number of landings made by each vessel type (% of Total N of June Landings) and the percentage of landings in pounds by each vessel type (% of Total lb of June Landings).

Years	Avg N of SR Vessels Making June Landings	**Avg N of DR Vessels Making June Landings**	% of Total N of June Landings by SR	**% of Total N of June Landings by DR**	% of Total lb of June Landings by SR	**% of Total lb of June Landings by DR**
1975-1979	19.6	**7.8**	74%	**26%**	35%	**65%**
1980-1989	19.5	**13.2**	63%	**37%**	32%	**68%**
1990-1999	31.5	**18.5**	61%	**39%**	35%	**65%**
2000-2009	2.5	**6.1**	27%	**73%**	25%	**75%**
2010-2019	3.8	**6.6**	31%	**69%**	38%	**62%**

Application of Correction Factor for Landings of Single-rigged Trawl Vessels

To consider whether applying a correction factor of 1.6 to the June catch per trip for single-rigged trawl vessels would allow their landings to be considered when determining if the fishery meets the criteria of the target or limit reference points, we compared the average June catch per trip of single- and double-rigged vessels (Figure 3). We repeated the comparison after applying the correction factor to single-rigged vessels (Figure 4). We found that applying the correction factor made single-rigged June catch per trip comparable to double-rigged and would allow for greater consistency in evaluating trends in the fishery.

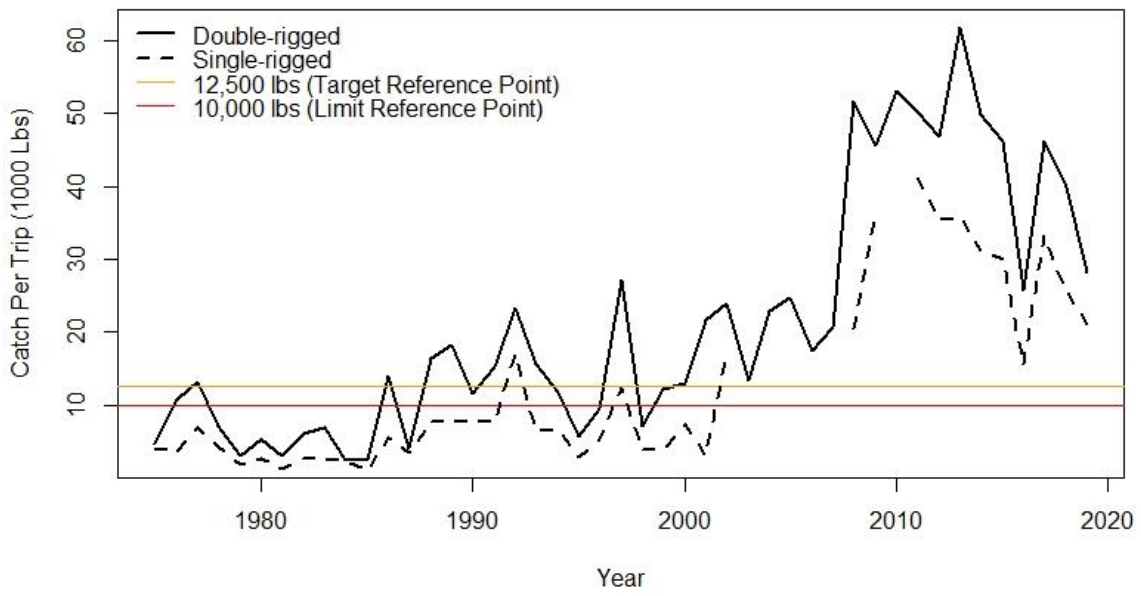

Figure 3. Average June catch/trip for single-rigged and double-rigged northern pink shrimp vessels.

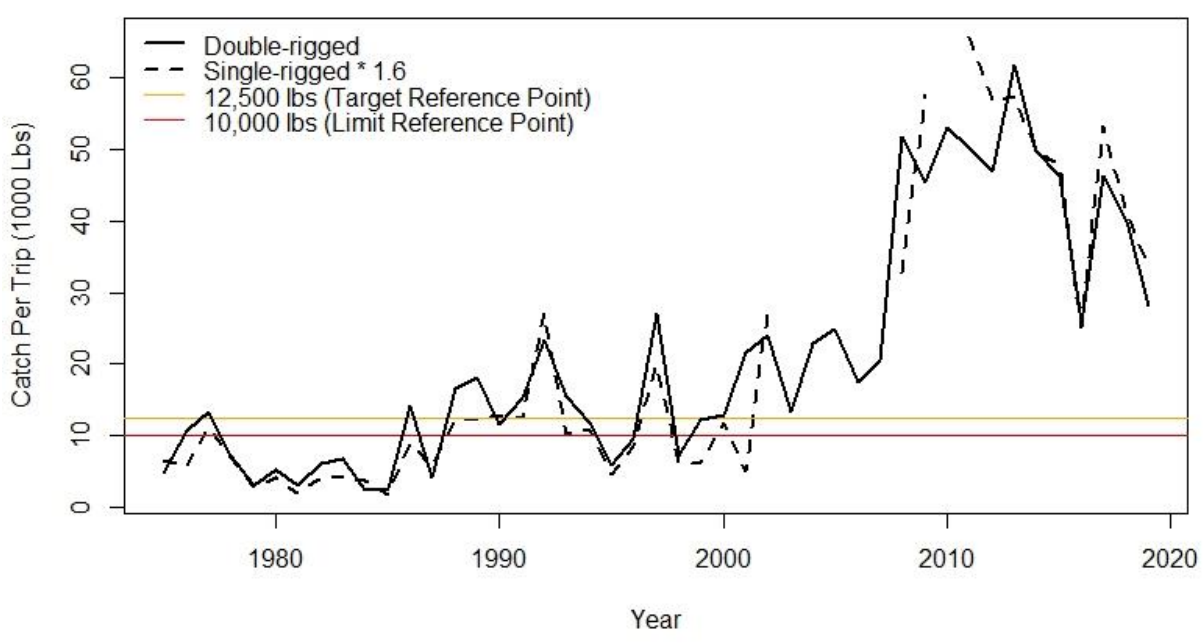

Figure 4. Average June catch/trip for adjusted single-rigged and double-rigged northern pink shrimp vessels. Single-rigged catch per trip was converted to double-rigged effort and then average June catch/trip values were compared with double-rigged vessels.

Recommendation

Based on the results of the analysis, the Department recommends adopting the ODFW HCR for use in California and applying a correction factor (1.6) to

June catch per trip landings for single-rigged vessels (Figure 5). This would provide the Department with an important adaptive management tool to ensure the sustainable harvest of the pink shrimp in California, where none has existed before. This rule sufficiently balances economic opportunity with resource protection.

An additional consideration is that California has historically relied on scientific studies conducted in Oregon, and operated under the assumption that environmental conditions, and stock health, are similar. The effects of climate change may alter the validity of that assumption, as the southern portion of the species range occurs off the California coast and therefore could be more likely to experience warm water conditions that negatively affect stock biomass. California may serve as an indicator and identify serious environmentally driven declines in the species before it is detected by the fisheries in Oregon and Washington.

Further, adoption of this rule increases the likelihood for MSC certification and may result in higher ex-vessel value and wholesale prices. This would provide additional income and stability for commercial fishers and processors on the northern California coast, where declines and volatility in crab, groundfish, and salmon fisheries have caused significant economic harm.

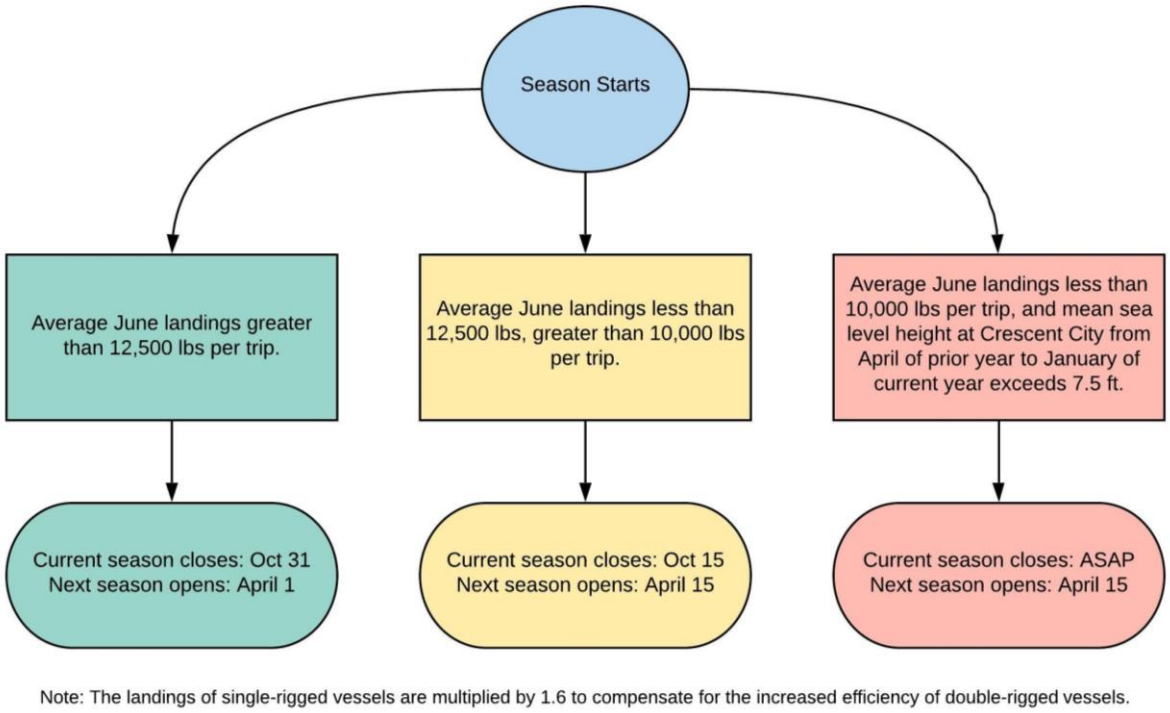

Figure 5. Flow chart of proposed harvest control rule for the California pink shrimp fishery.

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Appendix B: 2021 California Pink Shrimp Principle 3 Gap Analysis

8950 Martin Luther King Jr. Street N.

#202

St. Petersburg, Florida 33702-2211

Tel: (727) 563-9070

Fax: (727) 563-0207

Email:

MRAG.Americas@mragamericas.com

President: Andrew A. Rosenberg, Ph.D.

California Pink Shrimp

Principle 3 Gap-Analysis

Conformity Assessment Body (CAB)	MRAG Americas, Inc.
Assessment team	Susan Hanna
Fishery client	Pacific Seafood Group
Assessment type	Principle 3 gap analysis
Date	

Document Control Record

Document Draft	Submitted By	Date	Reviewed By	Date
1	Susan Hanna	6 Sept 2021	Amanda Stern-Pirlot	7 Sept 2021
FINAL	Susan Hanna	9 Sept 2021	Amanda Stern-Pirlot	14 Sept 2021

1. Executive summary

In 2015 MRAG Americas undertook an assessment of the Washington and California pink shrimp (*Pandalus jordani*) trawl fisheries against the MSC Principles and Criteria for Sustainable Fishing. The evaluation was undertaken as a "scope extension" to the currently certified Oregon pink shrimp fishery, asdescribed in MSC Fisheries Certification Requirements V2.0.

The result of that assessment was that the California fishery was not recommended for certification. Although no single indicators scored less than 60, the Principle 3 score was below 80 (77.1). The California management system was assessed to be strong on conservation and enforcement, but several weaknesses were also present. These weaknesses were identified as the lack of a fishery management plan (FMP) with explicit objectives, insufficient consultation processes, slow management decision-making, and the absence of regular external reviews (MRAG Americas, 2015).

Over the subsequent time period CDFW has taken action to address the identified deficiencies by strengthening stakeholder consultation processes and developing a draft pink shrimp FMP.

MRAG Americas was contracted in 2021 by Pacific Seafood Group to undertake this gap analysis to consider possible changes to scoring afforded by the development of a draft Fishery Management Plan

This P3 gap analysis gap analysis focuses on potential changes to P3 scores that would result from the existence of the shrimp FMP. It represents a reevaluation of the elements of P3 in light of the draft FMP. P3 is re-scored under the assumption that the draft FMP becomes adopted and implemented.

The analysis finds that the draft FMP contains new procedures and describes ongoing processes that will address many of the previously identified weaknesses in management objectives, decision and response flexibility and stakeholder consultation processes. The FMP does not describe the process or level of consultation used in its development, nor does it lay out a process for regular internal and external review.

Some of the scoring indicator rationale text uses information taken from the 2015 assessment. These sources of information would need to be updated if a full assessment is undertaken.

According to this analysis (with all the caveats listed above), with the new FMP implemented, the fishery would be well placed to pass an MSC assessment. A comparison of current score ranges with the scores from the previous scope extension assessment is given in the table below, noting the comparison is not identical because the MSC's Principle 3 standard has changed slightly since 2015.

2015 Results

3.1.1	Legal & customary framework	95
3.1.2	Consultation, roles & responsibilities	70
3.1.3	Long term objectives	80
3.1.4	Incentives for sustainable fishing	80
3.2.1	Fishery specific objectives	60
3.2.2	Decision making processes	80
3.2.3	Compliance & enforcement	95
3.2.4	Research plan	60
3.2.5	Management performance evaluation	70

Current Results

3.1.1	Legal & customary framework	≥80
3.1.2	Consultation, roles & responsibilities	≥80
3.1.3	Long term objectives	≥80
N/A	N/A	N/A
3.2.1	Fishery specific objectives	≥80
3.2.2	Decision making processes	≥80
3.2.3	Compliance & enforcement	≥80
N/A	N/A	N/A
3.2.4	Management performance evaluation	≥80

There is one unit of certification for this fishery:

Species:	Pink (Ocean) Shrimp (*Pandalus jordani*)
Geographical Area:	West Coast USA, Oregon, Washington, California (WOC)
Method of Capture:	Otter Trawl, single and double-rigged.
Fleet:	California permitted vessels fishing in WOC and US Exclusive Economic Zone (EEZ) waters, landing in California ports
Stock:	The west coast ocean shrimp stock which extends from south east Alaska to California waters.
Management System:	California Department of Fish and Wildlife
Client Group:	Pacific Seafood Group

1.1 Principle 3

1.1.1 Principle 3 background

The Fishery

The pink shrimp trawl sector off the U.S. West Coast operates in marine waters off Washington, Oregon, and Northern California. Harvesters are allowed to fish anywhere within US federal waters beyond state limits but may land their catch only in the states for which they have landing permits (Wargo, 2014). Since 2005 most California catch has been harvested off Eureka and landed into Crescent City and Eureka. California plants stopped processing shrimp in March 2020 and all shrimp landings were trucked into Oregon for processing (CDFW, 2021).

The California shrimp fishery has been divided into northern and southern regions since 2001. Vessels use both single-rigged and double-rigged trawl gear; at present the majority of vessels in the northern fishery are double-rigged, whereas the majority in the southern fishery are single-rigged (CDFW, 2021). Participation in the northern fishery requires a limited entry permit. Participation in the southern fishery also requires a permit but is open access. In 2020 the northern fishery had 39 permits; the southern fishery had 15 permits. The number of vessels participating in the shrimp fishery is strongly influenced by abundance, price and processing availability (CDFW, 2021).

Fishery regulations include a number of input controls including mandatory commercial fishing vessel licenses, limited entry shrimp fishing permits, season limits, maximum count per pound, bycatch reduction devices and incidental catch limits. In addition, the fishery is subject to conservation area restrictions, landings fees, and on-board observer coverage (CDFW, 2015a).

An opportunistic system of monitoring, control and surveillance is in place, involving CDFWP, NMFS West Coast Groundfish Observer Program (WCGOP), and US Coast Guard. Harvest control rules (seasons, maximum counts per pound and bycatch reduction devices) are clear and enforceable. In 2018 CDFW reinitiated port sampling of catch to collect biological data (CDFW, 2021).

Logbooks are required of all vessels (CDFW 2015a; FGC 8841) and would provide data to support analysis of fishing location and effort, but until recently resource constraints have prevented the logbook database from being kept up to date (Kalvass 2015). According to the draft FMP, CDFW staff have renewed efforts to input backlogged logbook data and maintain a database of current data (CDFW, 2021).

The California Management System

Administrative Context

The California Fish and Game Commission (CFGC) consists of five members appointed by the Governor subject to confirmation by the California Senate). The CFGC formulates management policies and sets fishing seasons and other regulations. It comprises three committees: Marine Resources (MRC), Wildlife Resources (WRC), and Tribal. The CFGC operates under a tribal consultation policy intended to promote working effectively with tribes to sustainably manage natural resources of mutual interest (CFGC, 2015c). The CFGC holds twelve meetings a year located throughout the State to encourage public outreach and participation (CFGC, 2014).

The California Department of Fish and Wildlife (CDFW) is charged with carrying out the policies set by the CFGC and as required by statute. The CDFW director is appointed by the CFGC. The Marine Region, covering the ports or port areas of Eureka, Fort Bragg, Bodega Bay, San Francisco, Monterey, Morro Bay, Santa Barbara, Los Angeles, and San Diego, has field responsibility for coastal shellfish, including pink shrimp. Because shrimp is not managed by a federal fishery management plan the state's jurisdictional boundary is the entire Exclusive Economic Zone (out to 200 nautical miles) (CDFW, 2021).

The California Department of Fish and Wildlife Police (CDFWP) are general authority peace officers deployed to the CDFW regions throughout the state, including the Marine Region. Officers also hold federal U.S. Fish and Wildlife and National Marine Fisheries Service (NMFS) commissions, and have jurisdiction over federal violations. Officers work joint patrols and coordinate with these agencies and the U.S. Coast Guard (McVeigh, 2015).

The Pacific States Marine Fisheries Commission (PSMFC) is an interstate compact agency that has no regulatory or management authority but instead serves as a neutral convener for interstate and state-federal coordination and data management. The California pink shrimp fish ticket data is entered into the PSMFC "E-Tix" system and combined with data from Oregon and Washington. The data are used to produce reports of shrimp landings and value by state or coastwide (PSMFC, 2014).

Legislative Context

The CFGC's decision process is governed by the California Administrative Procedure Act (APA) which allows public participation in the adoption of State regulations in order to ensure that the regulations are clear, necessary, and legally valid (CFGC 2014).

The Bagley-Keene Open Meeting Act of 1967 mandates open meetings for California State agencies, boards, and commissions. The Act facilitates accountability and transparency of government activities and protects the rights of citizens to participate in State government deliberations (CCR 1120-11132, 2015).

Accordingly, the CFGC provides an opportunity for members of the public to directly address the CFGC on each agenda item before or during the CFGC's discussion or consideration of an item. This includes advance notice of meetings and their agendas and the provision of meeting materials used in discussions.

Fishery Management Plan

The California Marine Life Management Act (MLMA) defines a fishery management plan as a document that describes the nature and problems of a fishery along with regulatory recommendations to manage the fishery (CMLMA, 1998).

Fishery management plans will provide:

- Biological information about the marine resources under consideration
- Habitat needs and issues
- Through the MLMA, the Legislature delegates greater management authority to the Fish and Wildlife Commission and the California Department of Fish and Wildlife
- Harvesters and their habits
- Conservation and management measures already in place
- The ecological role of the resource
- The environmental effects that might have to be considered
- The most appropriate management tools

Under the MLMA, FMPs are to include at least the seven following elements:

- Description of the fishery
- Fishery science and essential fishery information
- Basic fishery conservation measures
- Habitat provisions
- Bycatch and discards
- Overfishing and rebuilding
- Procedure for review and amendment of an FMP (CMLMA, 1998)

Until the development of the draft pink shrimp FMP in 2021 no specific official written management objectives or management plan existed for the California pink shrimp trawl fishery.

Fishery regulations designed to achieve the management objectives include a number of input controls. These include mandatory commercial fishing vessel licenses, limited entry shrimp fishing permits, season limits, maximum count per pound, bycatch reduction devices and incidental catch limits. In addition, the fishery is subject to conservation area restrictions, landings fees, and on-board observer coverage (CDFW, 2015; CCR 120.2, 2015).

Consultation and Public Participation in Management

The 2015 assessment found that although the CDFW was involved in multiple state, federal and regional policy processes related to the shrimp fishery and operated under an executive order requiring effective consultation with tribal communities, overall consultation processes were not well-developed nor widely employed (MRAG Americas, 2015; CDFW, 2015c). Stakeholder involvement in fishery management occurred primarily during periods of regulatory change (CDFW, 2021).

Since 2015 the Department has improved its communication with the shrimp fleet and processors by holding fleet meetings (2017; 2019), participating in shrimp capacity discussions at a CFGC Marine Resource Committee meeting (2017), and holding informational webinars (2020; 2021). The draft FMP indicates the CDFW intention to hold annual meetings with industry to keep it informed of changes and developments affecting the fishery (CDFW, 2021).

1.1.1 Principle 3 Performance Indicator scores and rationales

The P3 performance indicators were rescored and rationales rewritten as if the draft FMP were finalized and adopted as written. Some areas missing from the FMP could not be scored, and are noted. The text of the rationales is updated according to information provided in the draft FMP; some text from the 2015 assessment report not affected by the content of the draft FMP is presented unchanged. The 2015 material, while not expected to be affected by the adoption of the FMP, would need to be updated during a full assessment.

PI 3.1.1 – Legal and/or customary framework

The management system exists within an appropriate legal and/or customary framework which ensures that it:

Is capable of delivering sustainability in the UoA(s);

Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and

Incorporates an appropriate dispute resolution framework

a. Compatibility of laws or standards with effective management

SG 60	SG 80	SG 100
There is an effective national legal system **and a framework for cooperation** with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and **organised and effective cooperation** with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and **binding procedures governing cooperation with other parties** which delivers management outcomes consistent with MSC Principles 1 and 2.
Yes	**Yes**	**Yes**

Rationale:

At the state level, the management system operates within state laws and the California Code of Regulations (CCR). Fishery management decisions regarding pink shrimp are delegated by the California State Legislature to the Fish and Game Commission (CFGC) and implemented through the California Department of Fish and Wildlife (CDFW) (CFGC sect. 8841). The CFGC formulates fishery management policies and sets fishing seasons and other regulations to determine who may fish for pink shrimp, when they may fish and how they may fish. Regulations, such as the maximum count per pound, minimum mesh size and BRD specifications, are set in CCR. The CFGC and CDFW operate within a framework of state laws under Title 12 (Natural Resources) of the CCR. All California executive branch agencies are guided by the California Administrative Code (CAC) which codifies regulations and sets out general standards and procedures. The CACs pertaining to CDFW are contained in Title 14; rules and regulations pertaining specifically to commercial shrimp fishing are Pink shrimp permit holders are also subject to the provisions of CCR Title 14 §189 and FGC §8841.

In addition, all state entities adhere to the Bagley-Keene Open Public Meetings Act and the Public Records Act which require that all meetings of governing bodies and state agencies are open and accessible to the public, and that most public records be made available to members of the public (CCR 11020-11032; CCR 6250-6270).

The Administrative Procedure Act (2008) requires that agencies conduct a process that ensures public involvement opportunities and considers the economic impact of its rules. These cooperation procedures are binding.

Regulations are enforced by the CDFW Law Enforcement Division, which operates out of four districts. The Northern Coastal District oversees enforcement within the pink shrimp fishery (CDFW, 2015b; CDFW, 2015c; Farrell, 2015).

At the national level, management of state fisheries may take place within and may coordinate with a larger framework of federal laws, through the interface with the regional fishery management council system. Federal fishery management is carried out under the authority of the federal Magnuson-Stevens Fishery Conservation and Management Act (MSA), first passed in 1976 and most recently reauthorized in 2006 (MSA, 2007). The MSA is the principal law governing the harvest of fishery resources within the federal portion of the U.S. 200-mile zone. Under the MSA, the Pacific Fishery Management Council (PFMC) recommends management actions to the National Marine Fisheries Service (NMFS; also called NOAA Fisheries) for approval. Ultimate decision authority for fishery management lies with the Secretary of Commerce. In addition to the MSA, the PFMC adheres to a suite of "other applicable laws:" the National Environmental Policy Act (NEPA), the Endangered Species Act (ESA), the Marine Mammal Protection Act (MMPA), the Migratory Bird Treaty Act (MBTA); the Administrative Procedure Act (APA), Paperwork Reduction Act (PRA): Regulatory Flexibility Act (RFA): Coastal Zone Management Act (CZMA): and other relevant U.S. laws, Executive Orders and regulations (MSA, 2007). This national legal system outlines procedures governing cooperation among entities authorized to implement these acts. The procedures are well described in consultation rules, and are binding.

The primary interaction of the California pink shrimp fishery with the federal management system is through finfish bycatch limits and the Groundfish Observer Program. In addition, California cooperates with the federal system and with the other states through provision of data through the Pacific States Marine Fisheries Commission PacFIN database, agreements on gear specifications, joint enforcement agreements, and ETP management.

If adopted the shrimp FMP would add overfishing determination supported by reference points, provisions for ending overfishing, and the specification of rebuilding targets and procedures for rebuilding the overfished population if it falls below a biomass threshold.

b. Resolution of disputes

SG 60	SG 80	SG 100
The management system incorporates or is subject by law to a **mechanism** for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a **transparent mechanism** for the resolution of legal disputes which is **considered to be effective** in dealing with most issues and that is appropriate to the context of the UoA.	The management system incorporates or is subject by law to a **transparent mechanism** for the resolution of legal disputes that is appropriate to the context of the fishery and has been **tested and proven to be effective**.
Yes	**Yes**	**Yes**

Rationale

As described above under 3.1.1. SG 60a, the fishery is managed primarily under state statutes and administrative codes, in a fashion that respects domestic law. Federal rules apply to federally managed species that interact with the California management system. For the pink shrimp fishery, these rules pertain primarily to bycatch of federally managed species or species protected under the ESA (ESA, 1973).

The Bagley-Keene Open Meeting Act (CCR 11120-11132) and Public Records Act (CCR 6250-6270) ensure transparency and public access.

State and federal agents monitor fisheries and enforce compliance with the laws and regulations related to pink shrimp, incidentally caught groundfish, eulachon or other protected species, (CDFW 2015b; 2015c). California enforcement is represented on the PFMC Enforcement Consultants committee, which includes representatives from state enforcement agencies in Washington, Oregon, and California, and the federal government (PFMC, 2012b). Coordination of state and federal laws is accomplished through this body.

At the state level, the management system uses the CDFW Law Enforcement Division to enforce laws and regulations (CDFW, 2015b; 2015c). Fish and Wildlife Officers (FWOs) are general authority peace officers with responsibilities that include fish protection and commercial fish and shellfish harvest. In addition to state laws, they enforce federal laws and Oregon state statutes through memoranda of agreement (Farrell, 2015).

Formal mechanisms for resolving disputes include:

- Petition processes of the CFGC that allow issues to be brought for Commission decision (CFGC, 2015a; 2015b).
- The tri-state coordination process administered by the Pacific States Marine Fisheries Commission (PSMFC) can be activated as needed to resolve shrimp fishery management issues or disputes among Washington, Oregon and California (Abramson et al., 1981; Hannah, 2012).
- The coordination mechanism of the PFMC to resolve any disputes between state and federal fisheries (PFMC, 2004; 2007).

At the time of the 2015 assessment the shrimp fishery has not been subjected to legal challenge (Kalvass, 2015). However, timely implementation by the CFGC to the MLPA provisions on closed fishing areas provides an example of how the formal mechanisms outlined above have been tested and proven to be effective (CDFW, 2013).

c. Respect for rights

SG 60	SG 80	SG 100
The management system has a mechanism to **generally respect** the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to **observe** the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to **formally commit** to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
Yes	**Yes**	**Yes**

Since 2011 all California state agencies have operated under Executive Order B-10-11, requiring effective communication and consultation with California Indian tribes, seeking their meaningful input into regulations, rules, policies and other matters affective tribal communities (CA Office of the Governor, 2011).

Negotiated processes between CDFW and California federally recognized tribes around placement of marine protected areas have established a process that could serve as a template for continued communication (cf. CDFW, 2012). In addition, California has close consultation with tribes on salmon, through the Klamath River Management Council.

At the federal level, NMFS and management through the PFMC are both bound by Federal Executive Order 13175 (2000), which requires meaningful consultation and collaboration with Indian tribal governments. The sovereign status and co-manager role of Indian tribes over shared federal and tribal fishery resources is recognized. At the regional level, this role is reflected in a designated tribal seat on the Pacific Fishery Management Council (PFMC, 2012a).

References

CFGC sect. 8841; CCR Title 14 §189; CCR 11020-11032; CCR 6250-6270; CA Administrative Procedure Act, 2008; CDFW, 2015b; CDFW, 2015c; CFGC, 2015c; Farrell, 2015; Abramson et al., 1981; E.O. 13175, 2000; ESA, 1973;

Hannah, 2012; MSA, 2007; NMFS, 1997, Woods, 2005, PFMC, 2004; 2007; 2012b; CFGC, 2015a; 2015b; Kalvass, 2015; CDFW, 2012; CDFW, 2021; E.O. 13175, 2000; CA Office of the Governor, 2011.

Draft scoring range	**≥80**
Information gap indicator	**More information sought** Relevant updates to California state laws, Code of Regulations, federal laws, data systems, interstate agreements and legal challenges (if any) would be needed as part of a full assessment.

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 3.1.2 – Consultation, roles and responsibilities

The management system has effective consultation processes that are open to interested and affected parties

The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties

a. Roles and responsibilities

SG 60	SG 80	SG 100
Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **generally understood**.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **explicitly defined and well understood for key areas** of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **explicitly defined and well understood for all areas** of responsibility and interaction.
Yes	**Yes**	**No**

CFGC, CDFW, PFMC, and the state and federal enforcement entities of the CDFW Enforcement Division, US Coast Guard, and NMFS Enforcement are all explicitly identified, and roles defined, in statutes, administrative code, and operating procedures. Open lines of communication between agencies promote widespread understanding of the roles and responsibilities of respective entities. Lines of authority and responsibility among the state and federal entities are clear, as are procedures for coordination among them (Kalvass, 2015; Farrell, 2015).

The functions, roles and responsibilities are well defined for all areas of responsibility and action. An example of understanding of regulations on the part of the shrimp fishery is provided by good compliance rates of BRD adoption (Farrell, 2015).

In 2015 it was found that the low level of engagement between CDFW and the shrimp fishery created uncertainty as to whether all areas of responsibility and interaction are well understood. Stakeholder involvement primarily occurred during times of regulatory change, such as the requirement of bycatch reduction devices (BRDs) and the adoption of the restricted access program (CDFW, 2021).

Since that time CDFW has taken actions to improve communication with the shrimp fleet and processors in order to increase transparency about Department decision making and to enable collaboration with the fleet on stock dynamics and management actions. These actions include hosting a fleet meeting in 2017, participation in discussions about fleet capacity in 2017, hosting an online meeting in 2019 to discuss developments within the fishery, and holding informational webinars in 2020 and 2021. According to the draft FMP the intent is to hold annual informational meetings with stakeholders from here on out (CDFW, 2021).

Enhanced communication and provision of information will have increased understanding of areas of responsibility, improving the score for this SI. Discussions during a full assessment would be needed to determine the specific degree to which all areas of responsibility and interaction are well understood.

b. Consultation processes

SG 60	SG 80	SG 100
The management system includes consultation processes that **obtain relevant information** from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that **regularly seek and accept** relevant information, including local knowledge. The management system demonstrates considerationof the information obtained.	The management system includes consultation processes that **regularly seek and accept** relevant information, including local knowledge. The management system demonstrates consideration of the information and **explains how it is used or not used**.
Yes	**Yes**	**No**

Rationale:

The enforcement component of the management system regularly seeks and accepts relevant information through active consultation with the fleet and enforcement entities in Oregon and Washington. Enforcement uses local knowledge by getting regular feedback from the industry regarding such issues as conditions on the fishing grounds and gear innovation experiments. Specifically, consultations include dockside interactions between CDFW police, fleet and plants
(Farrell, 2015).

Whereas in 2015 consultation with the agency component of the management system was relatively weak, with no regular interaction between CDFW Invertebrate Program staff and industry (Kalvass, 2015), the level of consultation has since improved as described in SIa above. The conduct of five informational meetings and seminars since 2017 establishes a process of regular interaction between CDFW and industry stakeholders to provide, seek and accept relevant information.

The FMP does not provide information about how it plans to use information acquired during stakeholder consultations or to provide explanations as to how it is used or not used. In addition, the process or degree of stakeholder consultation in the development of the draft FMP is unclear. There is no mention of an intent to produce an annual newsletter to the industry or to establish an industry advisory committee for the pink shrimp fishery.

c. Participation

SG 60	SG 80	SG 100
	The consultation process **provides opportunity** for all interested and affected parties to be involved.	The consultation process provides **opportunity and encouragement** for all interested and affected parties to be involved, and **facilitates** their effective engagement.
	Yes	**Yes**

Rationale:

Opportunities for industry involvement are most frequent through interactions with CDFW law enforcement and testimony to the CFGC. The frequency of these interactions varies by the particular process. Enforcement dockside interactions occur once or twice weekly. The CFGC as a whole meets bi-monthly (Farrell, 2015; CFGC, 2015a).

The Bagley-Keene Open Meeting Act of California ensures the public right of access to any meetings of state bodies in addition to advance notice and minutes of these meetings. Some specific exceptions exist (Digital Media Law

Project 2015; CCR 11120-11132.). It is designed to promote greater public participation in government. CDFW routinely posts notices of public meetings about upcoming regulations on their website and at port offices. Likewise, announcements of California Fish and Game Commission (CFGC) meetings are posted on the CDFW website well in advance, with full information about meeting agendas (CFGC, 2015a). The CFGC provides online access for the content and schedule of new and proposed rulemaking as well as information on processes for permanent and emergency rulemaking, with information on how stakeholders can be involved (CFGC, 2015b). The California Public Records Act (CCR 6250-6270) ensures transparency of agency information.

At the regional level, the PFMC process provides open and transparent distribution of information as well as opportunities for engagement of interested parties through committee membership and public testimony. ENGOs are routinely engaged in this process (PFMC, 2012c). However, this process is only indirectly related to the state-managed pink shrimp fishery.

Executive Order 13132 (1999) requires federal agencies to consider the implications of policies that may limit the scope of or pre-empt states' legal authority. Such actions require a consultation process with the states and may not create unfunded mandates for the states. Any final published rule must be accompanied by a "federalism summary impact statement" (NMFS, 1997; PFMC, 2011b).

The Council process involves different types of consultations with member states through state agencies, Council appointees, advisory committee membership, and meetings. The process of state participation in the formulation of federal management measures encourages complementary approaches between federal and state approaches (PFMC, 2004; 2007). Consultations among state agency staff, industry stakeholders and ENGOs occurs informally through regular stakeholder meetings, interactions at the Pacific Fishery Management Council settings, interactions with congressional staff, and various other fora.

Improved consultation processes as represented in the draft FMP and described in SIa above demonstrate that CDFW is providing an opportunity and encouragement for the involvement of all interested stakeholders and is facilitating effective engagement.

References
Kalvass, 2015; Farrell, 2015; CFGC, 2015a; Digital Media Law Project 2015; CCR 11120-11132; CFGC, 2015a; 2015b; CCR 6250-6270; PFMC, 2012c; E.O. 13132, 1999; NMFS, 1997; PFMC, 2011d; PFMC, 2004; 2007; CDFW, 2021.

Draft scoring range	**≥80**
Information gap indicator	**More information sought** As part of a full assessment more information would be sought on the scope of stakeholder involvement aswell as Department plans for implementing further communication actions. More information would be needed on the process for and degree of consultation in the development of the draft FMP.

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage	
Overall Performance Indicator score	
Condition number (if relevant)	

PI 3.1.3 – Long term objectives

The management policy has clear long-term objectives to guide decision-makingthat are consistent with MSC Fisheries Standard, and incorporates the precautionary approach

a. Objectives

SG 60	SG 80	SG 100
Long-term objectives to guide decision-making, consistent with the MSC Fisheries Standard and the precautionary approach, are **implicit** within management policy.	**Clear** long-term objectives that guide decision-making, consistent with MSC Fisheries Standardand the precautionary approach are **explicit** within management policy.	**Clear** long-term objectives that guide decision-making, consistent with MSC Fisheries Standardand the precautionary approach, are **explicit** within **and required by** management policy.
Yes	**Yes**	**Partial**

Rationale:

Long-term objectives guiding all California fisheries are explicit within the Marine Life Management Act (MLMA) of 1998.

The MLMA contains goals and objectives the management of California fisheries. FMPs and regulations for all fisheries are expected to conform to the MLMA (MLMA, 1998).

The MLMA specifies seven goals, paraphrased as:

- Conserve entire ecosystems
- Recognize and protect non-consumptive values:
- Achieve sustainability
- Conserve and protect habitat
- Rebuild depressed fisheries
- Limit bycatch
- Minimize adverse impacts on fishing communities

To achieve these goals CDFW is required to prepare a master plan that lists fisheries by priority, according to the need of comprehensive management through FMPs. The purpose of FMPs is to base management decisions on clear objectives for and knowledge of a fishery (CDFW, 2001).

The MLMA, requires that FMPs include seven elements (CDFW, 2001):

- Description of the fishery
- Fishery science and essential fishery information
- Basic fishery conservation measures
- Habitat provisions
- Bycatch and discards
- Overfishing and rebuilding
- Procedure for review and amendment of an FMP

The Draft Shrimp FMP contains sections covering the seven elements required by the MLMA (CDFW, 2021). Clear long-term objectives to guide decision-making are explicitly provided, consistent with MSC Fisheries Standard and the precautionary approach. The extent to which these objectives will required in policy will depend on the adoption and implementation of the FMP and subsequent implementation guidelines.

References	
MLMA, 1998; CDFW, 2001; Kalvass, 2015; CFGC, 2015b; CDFW, 2021.	
Draft scoring range	**≥80**
Information gap indicator	**More information sought** A full assessment would examine the contents andimplementation status of a shrimp FMP.

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage	
Overall Performance Indicator score	
Condition number (if relevant)	

PI 3.2.1 – Fishery-specific objectives

The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2

a. Objectives

SG 60	SG 80	SG 100
Objectives, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are **implicit** within the fishery-specific management system.	**Short and long-term objectives**, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are **explicit** within the fishery-specific management system.	**Well defined and measurable short and long-term objectives**, which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are **explicit** within the fishery-specific management system.
Yes	**Yes**	**Yes**

Rationale:

As outlined in SIa above, the MLMA contains seven goals for fish and marine ecosystems (CDFW, 2001). These goals and objectives, intended for all California fisheries, apply explicitly to the shrimp fishery and have shaped the content of the draft shrimp FMP.

The early draft federal shrimp FMP (Abramson et al., 1981) also provided implicit management objectives to the California shrimp fishery, as do the National Standard Guidelines under which federal FMPs are structured (NMFS, 2005).

The draft FMP developed by CDFW comprises eight major sections: 1. The Species; 2. The Fishery; 3. Management; 4. Monitoring and essential fishery information; 5. New conservation and management measures; 6. Anticipated effects of additional management measures; 7. Future management needs and directions; 8. Review and amendment procedures. Appendix A contains an analysis of the Oregon Department of Fish and Wildlife's pink shrimp fishery harvest control rule and its potential application to the California shrimp fishery. The analysis concludes with a recommendation to adopt the ODFW HCR, corrected for gear type, in the California fishery (CDFW, 2021).

The draft FMP, in being consistent with the seven major elements of the MLMA, provides a set of long-term objectives for the fishery.

Both long-term and short-term fishery management objectives are provided through the FMP's adaptive management framework that promotes fishery sustainability, data quality enhancement and bycatch reduction. The framework meets these long-term objectives through requirements for a harvest control rule (HCR), standardized weighing of catch, and LED lights on nets.

The HCR is based on target and limit reference points (catch reference points as a proxy for spawning stock biomass and sea level height as a proxy for recruitment success. The HCR was developed by ODFW and has been adopted by both ODFW and WDFW, ensuring uniform coastwide management of the pink shrimp population if adopted by CDFW (Hannah and Jones, 2016; Wargo and Ayres, 2017). Standardized weighing of catch is achieved through a requirement to report landings weight net of ice using estimation methods consistent with Oregon and Washington. Reduction of bycatch is achieved through an existing requirement for BRDs and a new requirement for LED lights on nets (CDFW, 2021).

Should the FMP be adopted and implemented as written, it would meet the criterion of well-defined and measurable short and long-term objectives for management.

References

CDFW, 2001; Kalvass, 2015; Abramson et al., 1981; NMFS, 2005; Hannah and Jones, 2016; Wargo and Ayres, 2017; CDFW, 2021.

Draft scoring range	**≥80**
Information gap indicator	**More information sought** In order to score the fishery management system at the SG80 or SG100 level the full assessment would need toreview a finalized FMP. Also needed would be a description of the process for FMP adoption and implementation and the FMP's status within it.

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage	
Overall Performance Indicator score	
Condition number (if relevant)	

PI 3.2.2 – Decision-making processes

The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and hasan appropriate approach to actual disputes in the fishery

a. Decision-making process

SG 60	SG 80	SG 100
There are *some* decision making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are *established* decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
Yes	**Yes**	

Rationale:

Established decision-making processes are followed by the CFGC which has been delegated management authority for pink shrimp by the California State Legislature. These processes are stable and result in regulations designed to meet the overarching goals specified in the MLMA (CFGC, 2015a; 2015b). Implementation of the draft FMP will require the adoption of new regulations for HCR, LED lights and landing weights. The CFGC has the authority to make these regulatory changes through its esisting decision-making processes (CDFW, 2021).

b. Responsiveness of decision-making processes

SG 60	SG 80	SG 100
Decision-making processes respond to **serious issues** identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to **serious and other important issues** identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to **all issues** identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
Yes	**Yes**	**Yes**

Rationale:

Decision-making processes cover serious and important issues related to pink shrimp. A good example of decision response to all of these elements is the adoption of the finfish excluder grate to reduce rockfish bycatch and later, with smaller grate spacing, to protect ESA-listed eulachon. These successive BRD decisions were made in collaboration with industry members and enforcement in response to an identified need to reduce bycatch of finfish species, and in this way it was adaptive. The transparency, timeliness and adaptive manner of decision response is ensured by the Bagley-Keene Open Meeting Act (CCR 11120-11132) and Public Records Act (CCR 6250-6270).

California has had the least flexible rulemaking of the three west coast coastal states. Authority for pink shrimp management is held by the CFGC, which meets only every two months and typically has a full calendar, making rulemaking a slow process (Kalvass, 2015). Normal operations such as regular openings and closures are dealt with by CDFW, meeting basic timeliness requirements. The adoption of the management framework as presented in the FMP

would provide greater flexibility to adapt to changing conditions. The HCR contains actions conditional on stock status. Under the FMP the Department, in response to changing conditions, may implement a number of regulations without an FMP amendment, including the management of the limited access program, fishery impacts to habitat and bycatch (CDFW, 2021).

The flexibility accorded by the FMP would be in contrast to the legislative-commission decision making process that currently exists, which cannot readily respond to situations requiring immediate actions. The HCR, for example, would allow the closure of the fishery once specific conditions are met rather than wait for the statutory closure date. The timeliness of the decision-making process would be improved by the adoption of the framework process described in the draft FMP (CDFW, 2021).

Informal coordination of CDFW with ODFW and the availability of the Oregon Pink Shrimp Review, which in both its annual edition and a supplemental edition identified upcoming potential issues with eulachon in anticipation of its listing under ESA, helps identify need to take proactive action (cf. Hannah and Jones, 2014; 2015a).

Frequent communication and coordination between CDFW and ODFW enforcement establish enforcement priorities in anticipation of likely areas needing enforcement attention, and adapt to in-season enforcement issues as they emerge (Farrell, 2015).

Coordination and consultation between the state and federal processes, conducted through the PFMC process, promotes the consideration of the effects of pink shrimp fishery management decisions on other fisheries and ecosystem issues, for example the rebuilding of rockfish stocks and the protection of ESA listed species.

Decision-making processes outlined in the draft FMP will allow the timely response to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and be able to take account of the wider implications of decisions.

c. Use of precautionary approach

SG 60	SG 80	SG 100
	Decision-making processes use the precautionary approach and are based on best available information.	
	Yes	

Rationale:

Decision processes employed by the California State Legislature (in establishing law and policy) and the CFGC (in implementing policy) exhibit a precautionary approach to pink shrimp management and a basis in best available scientific information. A precautionary approach based on ecosystem management is explicit in the MLMA (CDFW, 2001). The regulations establishing maximum count per pound and closed seasons were implemented to minimize effort on small shrimp and prevent fishing on spawning aggregations (CFGC 8841). Adoption of the BRD requirement was a precautionary approach to minimize bycatch of rebuilding groundfish stocks. Further strengthening of the BRD specifications was a proactive and precautionary approach to minimizing all bycatch, including eulachon, recently listed as threatened under the ESA (CDFW, 2015a; CFGC, 2015b; CDFW, 2001). The fleet's experimentation with LED lights on gear is part of the overall effort to minimize non-shrimp bycatch (Farrell, 2015).

The draft FMP addresses the precautionary approach directly in Section 6.1 by noting that the effect of the HRC, LED requirement and catch weighing requirements is expected to be a more precautionary approach to management (CDFW, 2021).

CDFW staff are in communication with ODFW staff and members of the Oregon fleet who are conducting research with respect to both the target species and P2 species and impacts. In this way the California pink shrimp fishery has access to the best available information, including new and emerging research results.

d. Accountability and transparency of management system and decision-making process

SG 60	SG 80	SG 100
Some information on the fishery's performance and management action is generally available on request to stakeholders.	**Information on the fishery's performance and management action is available on request**, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders **provides comprehensive information on the fishery's performance and management actions** and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
Yes	**Yes**	**No**

Rationale:

CFGC meeting minutes and records of decisions are available online (CFGC, 2015a; 2015b).

CDFW enforcement officers fill out daily electronic reports of enforcement activities, although these reports cover all enforcement contacts and do not contain a separate code for pink shrimp (Farrell, 2015). Annual summary reports are generated from daily reports (CDFW, 2015b; 2015c).

With regard to finfish bycatch, observer coverage and ETP protections, the PFMC newsletters describe actions taken at Council meetings, committee openings and meeting schedules, and upcoming issues (PFMC, 2012d). The Federal Register provides notice of all proposed federal actions (cf. Federal Register, 2012; 2013)

Formal reporting to stakeholders is in the form of records of CFGC meetings and decisions, enforcement reports, and the series of information meetings and webinars described in 3.1.2b above. These are available online.

At present logbook data and overall fishery performance remain unanalyzed, so the standard of comprehensive information is not met. The draft FMP proposes processes to be used to evaluate the health of the stock and performance of management strategies on a periodic basis as part of the updating of the shrimp enhanced status report (ESR). The frequency of this updating is not yet specified.

e. Approach of dispute

SG 60	SG 80	SG 100
Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.
Yes	**Yes**	**Yes**

Rationale:

At the time of the 2015 assessment the shrimp fishery had not been subjected to legal challenge (Kalvass, 2015). Implementation by the CFGC of the MLPA provisions on closed fishing areas provides an example of the timely response to the management system to judicial decisions (CDFW, 2012).

As another example, the process followed by the CDFW and CFGC for the controversial abalone recovery and management plan (ARMP) illustrates the ability of the management system to proactively avoid legal disputes. During the development of the ARMP, informal comments received through an advisory panel, workshops, letters, and the CDFW website were used to shape and revise the plan. A formal public review period included written and oral comments that were used to amend the plan prior to CFGC adoption. CDFW responded to all comments (Kalvass, 2015).

The active engagement of CDFW enforcement personnel with shrimp fishers and processors represents proactive action to anticipate and avoid legal disputes, particularly surrounding inter-state differences in gear regulations. Whereas previously CDFW management maintained a low level of engagement with the shrimp fishery, the series of meetings and webinars held since 2017 has increased the degree of consultation and communication (CDFW, 2021). If the FMP with its new requirements are adopted CDFW plans to conduct outreach and education with stakeholders.

References

CFGC, 2015a; 2015b; CCR 11120-11132; CCR 6250-6270; Hannah and Jones, 2014; Farrell, 2015; CDFW, 2001; CFGC 8841; CDFW, 2015a; 2015b; 2015c Farrell, 2015; Kalvass, 2015; PFMC, 2012d; Federal Register, 2012; 2013; CDFW, 2021.

Draft scoring range	**≥80**
Information gap indicator	**More information sought** As part of a full assessment more information would be sought on the degree of certainty of continuing annual stakeholder meetings as well as the frequency of evaluating management performance, stock status and impacts of regulations. More specifics will be sought on the nature and extent of the education and outreach programs about new requirements embedded in the FMP.

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 3.2.3 – Compliance and enforcement

Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with

a. MCS implementation

SG 60	SG 80	SG 100
Monitoring, control and surveillance **mechanisms** exist, and are implemented in the fishery and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance **system** has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A **comprehensive** monitoring, control and surveillance system has been implemented in the fishery and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
Yes	**Yes**	**Yes**

Rationale:

The overall harvest strategy comprising seasons, maximum counts per pound, minimum mesh size and bycatch reduction devices is clear and enforceable. A comprehensive system of monitoring, control and surveillance for compliance and enforcement is in place, involving CDFW Enforcement, NMFS West Coast Groundfish Observer Program, and the US Coast Guard. The Groundfish Observer Program has a coverage target of approximately 15% of pink shrimp trips and monitors the biological parameters of the total catch (McVeigh, 2015).

CDFW enforcement officers conduct random dockside checks of compliance with regulations on count-per-pound and bycatch reduction device spacing (Farrell, 2015). Compliance with the count-per-pound regulation is reinforced by market preferences for larger shrimp. At-sea compliance with regulations (seasons, closed areas, licenses) is conducted by the US Coast Guard by vessel patrol. While fishing in the federal EEZ (3-200 miles offshore) vessels are also subject to federal rules and sanctions enforced by the US Coast Guard and the NMFS Office of Law Enforcement, such as the requirement (since 2008) that pink shrimp vessels be equipped with VMS (NMFS 2011a, 2011b, 2011c).

Fishery landings are monitored through state-issued fish tickets. Beginning in 2019 all landings data are entered directly by seafood buyers into an electronic database (E-Tix) managed by the Pacific States Marine Fisheries Commission (PSMFC) and accessible to CDFW staff (CDFW, 2021).

In 2018 CDFW, with the assistance of processors, reinitiated port sampling of shrimp. The goal is to incorporate sampling data with those of Oregon and Washington creating a coastwide data system. In addition, CDFW staff have renewed efforts to maintain a database of logbook data and to input backlogged data (CDFW, 2021).

CDFW enforcement does count-per-pound checks on a random basis. (Kalvass, 2015; Farrell, 2015). The system of enforcement monitoring and control has demonstrated a consistent ability to enforce management regulations (Farrell, 2015).

b. Sanctions

SG 60	SG 80	SG 100
Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, **are consistently applied** and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and **demonstrably** provide effective deterrence.
Yes	**Yes**	**Yes**

Rationale:

Sanctions for non-compliance exist, defined in law and enforced through at-sea and dockside monitoring. CDFW enforcement officers issue tickets for non-compliance. Violations of commercial fishing regulations are penalized by fines or revocation of licenses (CDFW, 2015a; 2015e).

CDFW enforcement provides information on compliance and enforcement to the CDFW and CFGC through daily andannual reports. Effectiveness of sanctions is evidenced by the high rate of compliance. Good relationships with processors and the fleet have created a climate promoting informing enforcement of potential compliance issues. Season openings, BRD specifications, and count-per-pound are all fully enforceable regulations (Farrell, 2015).

c. Compliance

SG 60	SG 80	SG 100
Fishers are **generally thought** to comply with the management system forthe fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	**Some evidence exists** to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a **high degree of confidence** that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.
Yes	**Yes**	**No**

Rationale:

As indicated in 3.2.3.b above, Season openings, BRD specifications, and count-per-pound are all fully enforceable regulations. State waters previously open to shrimp trawling were closed in 2008; shrimp trawling is now only allowed in federal waters (CDFW, 2021).

However, discussion with enforcement during the 2015 site review identified a source of complication for enforcement. California regulations regarding minimum mesh size and excluder grate spacing (2” in CA; ¾” in OR and WA) are slightly different from those in Oregon and Washington, requiring additional monitoring of California-licensed and Oregon-licensed vessels delivering into California ports. As a consequence of these differences in regulations, enforcement resources may not always be sufficient to catch violations. Reconciling the state differences in these regulations was identified as a regulatory change that would help enforcement make more effective use of limited resources (Farrell, 2015).

Otherwise, compliance is generally good, with good collaboration across enforcement agencies, control rules that are clear and enforceable and a coordinated monitoring and enforcement infrastructure. The issue of different state regulations does prevent the standard of a high degree of confidence in compliance in these areas from being met.

d. Systematic non-compliance

SG 60	SG 80	SG 100
	There is no evidence of systematic non-compliance.	
	Yes	

Rationale:

As described in 100b, there is no evidence of systematic non-compliance, however, different regulations affecting California and Oregon vessels pose monitoring complications for enforcement, as described in SG100c.

References

McVeigh, 2015; Farrell, 2015; NMFS 2011a, 2011b, 2011c; Kalvass, 2015; CDFW, 2015a; 2015e; CDFW, 2021.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage

Draft scoring range	**≥80**
Information gap indicator	**More information sought** As part of a full assessment more specific information would be sought on the operation of the port sampling program and whether data are now regularly combined with those of OR and WA. More specific information on the status of logbook data entry and analysis would be sought. Updated information on enforcement resources, any efforts to standardize mesh size regulations across states and the degree of compliance would also be needed.

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

PI 3.2.4 – Monitoring and management performance evaluation

There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives
There is effective and timely review of the fishery-specific management system

a. Evaluation coverage

SG 60	SG 80	SG 100
There are mechanisms in place to evaluate **some** parts of the fishery-specific management system.	There are mechanisms in place to evaluate **key** parts of the fishery-specific management system.	There are mechanisms in place to evaluate **all** parts of the fishery-specific management system.
Yes	**Yes**	**No**

Rationale

The monitoring and compliance components of management performance are evaluated annually by CDFW enforcement and reported in the annual newsletter (Farrell, 2015). The CFGC evaluates shrimp fishery management as issues arise (Kalvass, 2015).

The fishery has in place mechanisms to evaluate key aspects of the management system. Population indicators and bycatch are monitored through at-sea sampling through the WC GOP. Amount of landed catch is comprehensively monitored through dockside sampling and fish tickets. Performance of BRDs – in terms of effectiveness of bycatch reduction as well as impact on fishing operations – is monitored through onboard observer reports and stakeholder feedback.

The draft FMP proposes to include periodic review of the performance of the new target and limit reference points (CDFW, 2021). The FMP also proposes adopting methods similar to those used in OR and WA of accurately measuring the net weight of shrimp by accounting for ice weight.

The draft FMP states that CDFW will monitor the performance of the new management framework by analyzing catch, fleet participation, size, age and sex information. Data correction procedures will be evaluated.

Before 2018 regular dockside biological monitoring was not conducted by CDFW (Kalvass, 2015). In 2018 CDFW, with the assistance of processors, reinitiated port sampling of shrimp. The goal is to incorporate sampling data with those of Oregon and Washington creating a coastwide data system.

Basic economic performance of the fishery is annually evaluated in terms of ex-vessel price, landed quantities and value (cf. CDFW, 2015f).

Mandatory logbooks provide a database to support analysis of fishing location and effort, but resource constraints have prevented the logbook database from being kept up to date. By 2015, electronic files of logbook data were partially complete (Kalvass, 2015). CDFW staff have now renewed efforts to maintain a database of logbook data and to input backlogged data (CDFW, 2021).

However, a lack of information about the status of California data in the tri-state system and the timeframe for the full entry of logbook data means that there are not mechanisms in place to evaluate all parts of the fishery management system.

b. Internal and/or external review

SG 60	SG 80	SG 100
The fishery-specific management system is subject to **occasional internal** review.	The fishery-specific management system is subject to **regular internal** and **occasional external** review.	The fishery-specific management system is subject to **regular internaland external** review.
Yes	**Yes**	**No**

To the extent that the ODFW Annual Pink Shrimp Review identifies issues and performance indicators of relevance to the California shrimp fishery, it contains post-season summaries and is available online to CDFW and to the California shrimp fishery (cf. Hannah and Jones, 2014; 2015a). CDFW staff also discusses compliance and enforcement issues with CDFW enforcement (Farrell, 2015; Kalvass, 2015).

In addition, throughout the season CDFW enforcement and the WC GOP is involved in the continual monitoring of control rules, catch quantity, quality and size composition of catch, and bycatch.

In this manner the management system is subjected to regular internal review and limited external review. However, the review process and status of the draft FMP (internal CDFW review, public review and comment) is not indicated in the FMP document, nor is the procedure to be followed for FMP adoption and implementation.

The draft FMP contains plans for enhanced approaches for internal review, but does not specify their frequency. The FMP does not address the issue of external reviews.

References

Farrell, 2015; Kalvass, 2015; Hannah and Jones, 2014; 2015a; CDFW, 2015f; Frimodig et al., 2007; Frimodig, 2008; CDFW, 2021.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage

Draft scoring range	**≥80**
Information gap indicator	**More information sought** As part of a full assessment more specific information would be sought on the nature and frequency of evaluations of the new management framework and data correction procedures. Information would also be needed on the existence or plans for external reviews. More specific information on the status of logbook data entry and analysis would be sought. Information would be needed on the status of California biological sampling data within the tri-state system. Updated information on enforcement resources and the degree of compliance would also be needed.

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	
Condition number (if relevant)	

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Appendix C: Pink Shrimp Fishery Management Plan Initial Study with Addendum.

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Marine Region
1933 Cliff Drive, Suite 9
Santa Barbara, CA 93109
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

October 4, 2021

NOTICE OF PREPARATION OF AN ENVIRONMENTAL DOCUMENT AND PUBLIC SCOPING MEETING NOTICE FOR THE PINK SHRIMP FISHERY MANAGEMENT PLAN PROJECT

Pursuant to the California Environmental Quality Act (CEQA) Guidelines Section 15050, the California Fish and Game Commission (Commission) is the Lead Agency responsible for the approval of a Fishery Management Plan (FMP) for the commercial pink shrimp (*Pandalus jordani*) trawl fishery (proposed project). The California Department of Fish and Wildlife (Department) has prepared a draft FMP and is assisting in the preparation of an environmental document addressing the potential impacts associated with the proposed project that meet CEQA requirements (14 CCR §§ 750 *et seq.*). The purpose of this Notice of Preparation (NOP) is to provide an opportunity for the public, interested parties, and public agencies to comment on the scope and proposed content of the environmental document. A draft Initial Study (IS) has been prepared, which serves as a preliminary analysis of the project's potential impacts (see California Code of Regulations (CCR), Title. 14, § 781.5.), and is available at https://wildlife.ca.gov/Notices for public review and comment for a 30-day public review period from October 4, 2021 to November 3, 2021.

Pursuant to CEQA Guidelines Section 15082, responsible and trustee agencies and other interested parties, including members of the public, must submit any comments in response to this notice no later than 30 days after receipt of the notice. Written comments regarding the proposed scope of the environmental analysis can be sent to Anthony.Shiao@wildlife.ca.gov or by mail to the following address:

Attn: Anthony Shiao
California Department of Fish and Wildlife
1933 Cliff Drive, Suite 9
Santa Barbara, CA 93109

All comments must be received no later than November 3, 2021. Responsible agencies are requested to indicate their statutory responsibilities in connection with this project when responding.

Scoping Meeting:

The Department will hold a public scoping meeting on October 21, 2021, from 9:00 AM to 10:00 AM. This meeting will take place virtually. Please visit the Department's website at https://wildlife.ca.gov/Notices for additional information.

Project Location:

The project would establish a management framework for the California pink shrimp commercial trawl fishery through a fishery management plan (FMP). The range of this fishery is limited by a combination of biological and regulatory factors. Pink shrimp are found at depth shallower than 1,200 ft (~360 m) in sandy mud habitat (Dahlstrom 1973). Shrimp trawling is currently prohibited inside state waters (Fish and Game Code (FGC) §§ 8833, 8835, 8836, & 8842); it is also subject to exclusion from the federal Essential Fish Habitat Conservation Areas (EFHCA; 50 CFR §§ 660.11, 660.12, & 660.79). Figure 1 below represents the project area by incorporating the maximum depth where pink shrimps occur, the limit of the state jurisdiction, and existing EFHCAs.

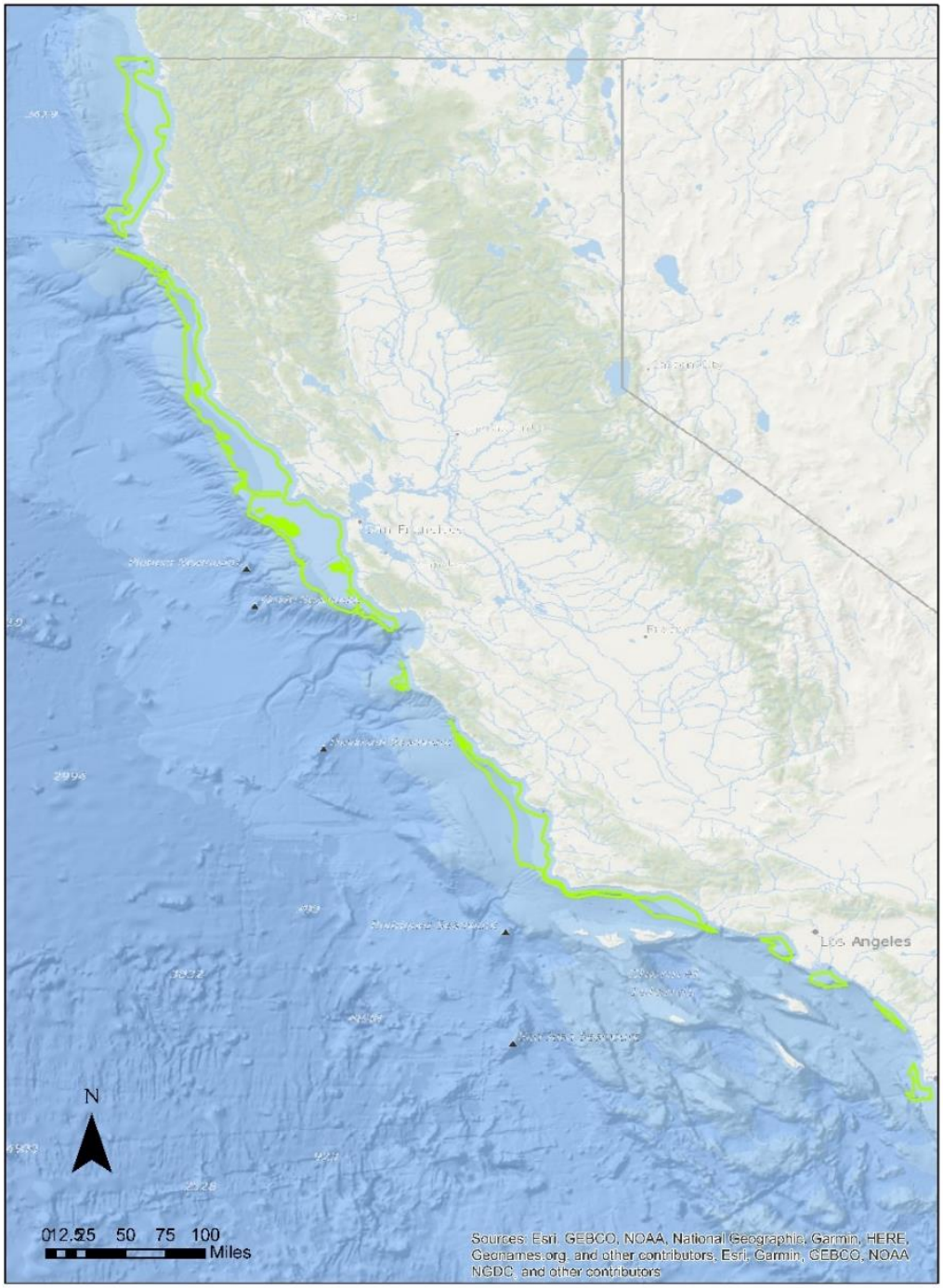


Figure 1. Project Area (Area outside of state jurisdiction and less than 360-meter depth off California Coast; bounded by green line with solid green areas denoting federal conservation areas where bottom trawling is prohibited.)

Description of project:

The proposed project is the pink shrimp FMP. The FMP will establish a comprehensive management framework for the commercial pink shrimp trawl fishery to be implemented through a concurrent rulemaking action. While pink shrimp trawling is prohibited in California state waters, it can still take place in federal waters. California state

government retains jurisdiction over the vessels that land pink shrimp in California ports. Oregon and Washington, which target the same pink shrimp stock, also exercise similar jurisdictions over landings occurring in their respective ports.

Pink shrimp (*Pandalus jordani*) is an oceanic shrimp species that range from southeast Alaska down through Baja California (Figure 2). However, they are only abundant enough to support a commercial fishery between British Columbia and Point Arguello, California during most years (Hannah and Jones 2007). As such most fishing activities in California have occurred north of Point Conception. Fishing south of Point Conception can be conducted under a general open access permit, as opposed to a limited-entry one (Title 14, California Code of Regulations (CCR), § 120.2).

Figure 2. Range of pink shrimp (Pandalus jordani).

The pink shrimp fishery runs from April 1 to October 31 of each year, though vessels may not start fishing until May based on a suite of market and environmental conditions. As mentioned above, California has prohibited shrimp trawling within state waters. However, fishing in federal waters off California is still allowed, and since 2016, the majority of shrimp caught off northern California waters were landed in Oregon as opposed to California (Figure 3).

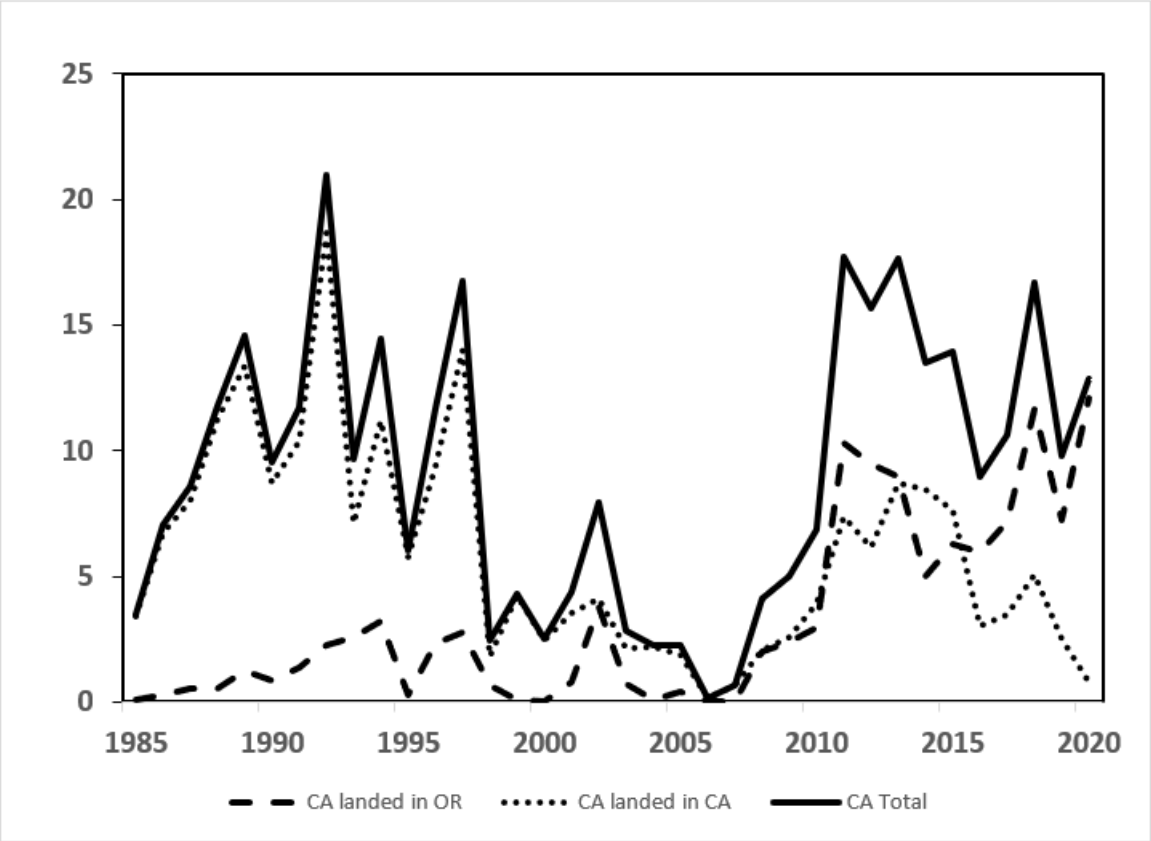


Figure 3. Landing state and weight of landings (million lb) of pink shrimp harvested in California waters, 1985-2020 (Source: CDFW MLDS).

The proposed FMP would establish a harvest control rule (HCR) for the commercial pink shrimp fishery utilizing catch reference points (June catch per trip) as a proxy for spawning stock biomass in a given year and an environmental indicator (sea level height) as a proxy for recruitment success. The reference points and the environmental indicators were developed by the Oregon Department of Fish and Wildlife (ODFW) and adopted by the Washington Department of Fish and Wildlife. Both states have incorporated these reference points into their pink shrimp FMPs. Use of these reference points by California would ensure uniform coastwide management of this fishery.

The FMP would also establish a requirement for all pink shrimp trawl vessels operating north of Point Conception to attach lights along the footrope of their trawl gear to reduce catch of non-target species. Research by ODFW and Pacific States Marine Fisheries Commission indicates that attaching LED lights on nets reduced eulachon bycatch by 90.5% and juvenile rockfish catch by 78%, with negligible impacts on shrimp retention (Hannah et al. 2015). Because of the threatened status of the southern distinct population segment of eulachon under the federal Endangered Species Act (75 FR 13012), the conservation of this fish species carries an utmost importance in the context of state and federal laws and policy. This effective, low-cost solution to address eulachon bycatch is currently being used voluntarily in California and regulations requiring LED use will be proposed in connection with this FMP. The adoption of this requirement will also bring California in line with the similar requirements in Oregon and

Washington. The requirement only applies to fishing activities north of Point Conception due to the rarity of both pink shrimp and eulachon further south.

The FMP would also prescribe a framework allowing fish businesses to estimate pink shrimp landings while the shrimps are mixed with ice. 14 CCR § 197 requires landing receipts to be recorded with the accurate weight of any fish landings, and Fish and Game Code § 8042 further requires seafood processors to pay landing fees by the number of pounds of fish delivered to them by fishermen. However, the fishery has been keeping its catch in ice until processing due to the speed at which the product degrades when out of ice. The new rule would allow the businesses to continue this practice but still maintain accountability under § 197.

Finally, the FMP will render Subsection 8842(b) of the California Fish and Game code inoperative, as applied to only the pink shrimp fishery once the implementing regulations are in place. This would remove ambiguity about the legality of pink shrimp trawling in state waters and clarify that prior to the authorization of any pink shrimp trawling in state waters the standards specified in 8842 (d) must be met.

Initial study addendum

Since the release of the Initial Study, which was circulated with the Notice of Preparation (NOP) of an environmental document that is to serve the functional equivalent of an Environmental Impact Report (EIR) pursuant to the Fish and Game Commission's Certified Regulatory Program (Cal. Code Regs., tit. 14, Section 781.5) on October 4, 2021, staff have identified the following minor clarifications and editorial changes to the description and analysis of the proposed project provided in the Initial Study. These updates do not result in a substantial change to the intent or content of the analysis or impact conclusions in the Initial Study. Shown in the Initial Study in **~~strikethrough~~** (for deleted text) and **underline** (for added text) format, these changes do not require re-circulation of the Initial Study. The updates were added to reflect further clarification of the Project Location, new tribal outreach that has taken place since the circulation of the NOP, and other minor editorial changes, as follow:

- Information was added to the Initial Study section on Project Location that makes clear the areas affected by the proposed project are specific to coastal counties (i.e., Del Norte, Humboldt, and San Luis Obispo) where pink shrimp landings occur. While the geographic range of pink shrimp stretches along the Pacific coast of California, the pink shrimp fishery in California predominately occurs north of Point Conception with landings at ports within Del Norte, Humboldt, and San Luis Obispo Counties only. The analysis in the Initial Study evaluates both the affected counties as well as area of potential effect (i.e., geographic range which pink shrimp fishing may occur).

- Information was added to the Initial Study section on Surrounding Land Uses and Setting. The description in the text that refers to Figure 5 has been updated to clarify the specific counties where pink shrimp landing occurs by port.

- Information was added to the Initial Study section on Tribal Cultural Resources to reflect notification of the proposed project pursuant to the requirements of Assembly Bill (AB) 52.

- Other minor, non-substantive editorial changes were made to the Initial Study to improve clarity and consistency.

CEQA Appendix G: (Signed Original On-File Received 10/01/2021)
Environmental Checklist form

1. **Project Title:** Pink (Ocean) Shrimp, *Pandalus Jordani,* Fishery Management Plan

2. **Lead Agency and Contact**

   Melissa Miller-Henson, Executive Director
   California Fish and Game Commission
   P.O. Box 944209
   Sacramento, CA 94244-2090

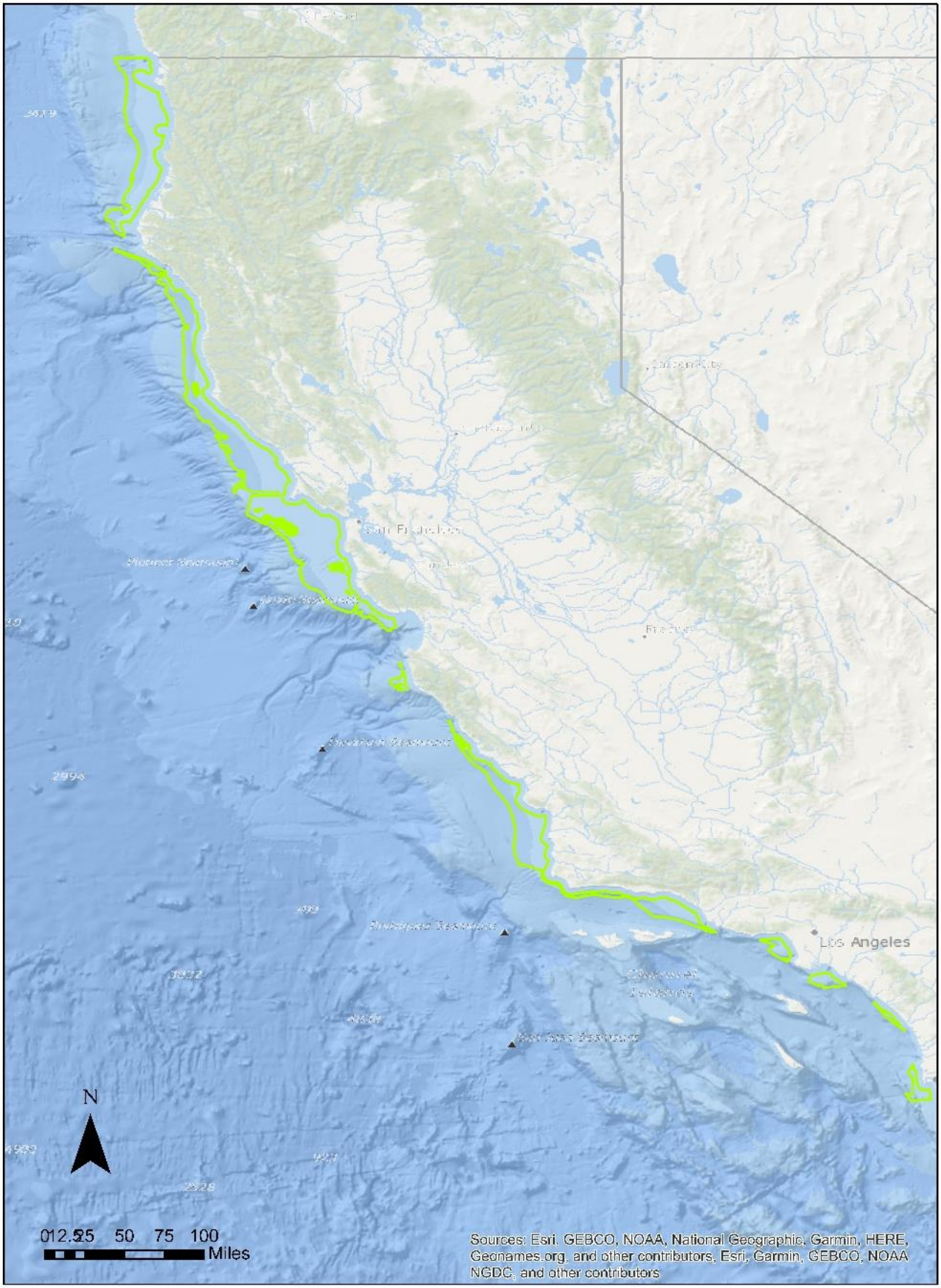
3. **Contact Person**

   Anthony Shiao
   California Department of Fish and Wildlife
   1933 Cliff Drive, Suite 9
   Santa Barbara, CA 93109

4. **Project Location**

   The project would establish a management framework for the California pink shrimp commercial trawl fishery through a fishery management plan (FMP). The range of this fishery is limited by a combination of biological and regulatory factors.

   Pink shrimp are found at depth shallower than 1,200 feet (~360 meters) in sandy mud habitat (Dahlstrom 1973). Shrimp trawling is currently prohibited inside state waters (Fish and Game Code (FGC) sections 8833, 8835, 8836, and 8842); it is also subject to exclusion from the federal essential fish habitat conservation areas (EFHCA; 50 Code of Federal Regulations, sections 660.11, 660.12, and 660.79). Figure 1 represents the project**'s** area **of potential effects** by incorporating the maximum depth where pink shrimp occurs, the limit of the state jurisdiction, and existing EFHCAs. **While this area spans the coast of California (Figure 1), California's pink shrimp fishery predominately occurs north of Point Conception with landing occurring only at ports within Del Norte, Humboldt, and San Luis Obispo Counties (for additional information, see Surrounding Land Uses and Setting).**


Los Angeles
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Sources: Esri, GEBCO, NOAA, National Geographic, Garmin, HERE, Geonames.org, and other contributors, Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

Figure 1. Project Area (Area outside of state jurisdiction and less than 360-meter depth off California Coast; bounded by green line with solid green areas denoting federal conservation areas where bottom trawling is prohibited.)

5. General Plan Designation: NA

6. Zoning: NA

7. Description of Project

The proposed project is the pink shrimp FMP. The FMP will establish a comprehensive management framework for the commercial pink shrimp trawl fishery to be implemented through a concurrent rulemaking action. While pink shrimp trawling is prohibited in California state waters, it can still take place in federal waters. California state government retains jurisdiction over the vessels that land pink shrimp in California ports. Oregon and Washington, which target the same pink shrimp stock, also exercise similar jurisdictions over landings occurring in their respective ports.

Pink shrimp (*Pandalus jordani*) is an oceanic shrimp species that range from southeast Alaska down through Baja California (Figure 2). However, it is only abundant enough to support a commercial fishery between British Columbia and Point Arguello, California during most years (Hannah and Jones 2007). As such, most fishing activities in California have occurred north of Point Conception. Fishing south of Point Conception can be conducted under a general open access permit, as opposed to a limited-entry permit (Title 14, California Code of Regulations (CCR), Section 120.2).

Figure 2. Range of pink shrimp (Pandalus jordani).

The pink shrimp fishery runs from April 1 to October 31 of each year, though vessels may not start fishing until May based on a suite of market and environmental conditions. As mentioned above, California has prohibited shrimp trawling within state waters. However, fishing in federal waters off California is still allowed, and since 2016, the majority of shrimp caught off northern California waters were landed in Oregon as opposed to California (Figure 3).

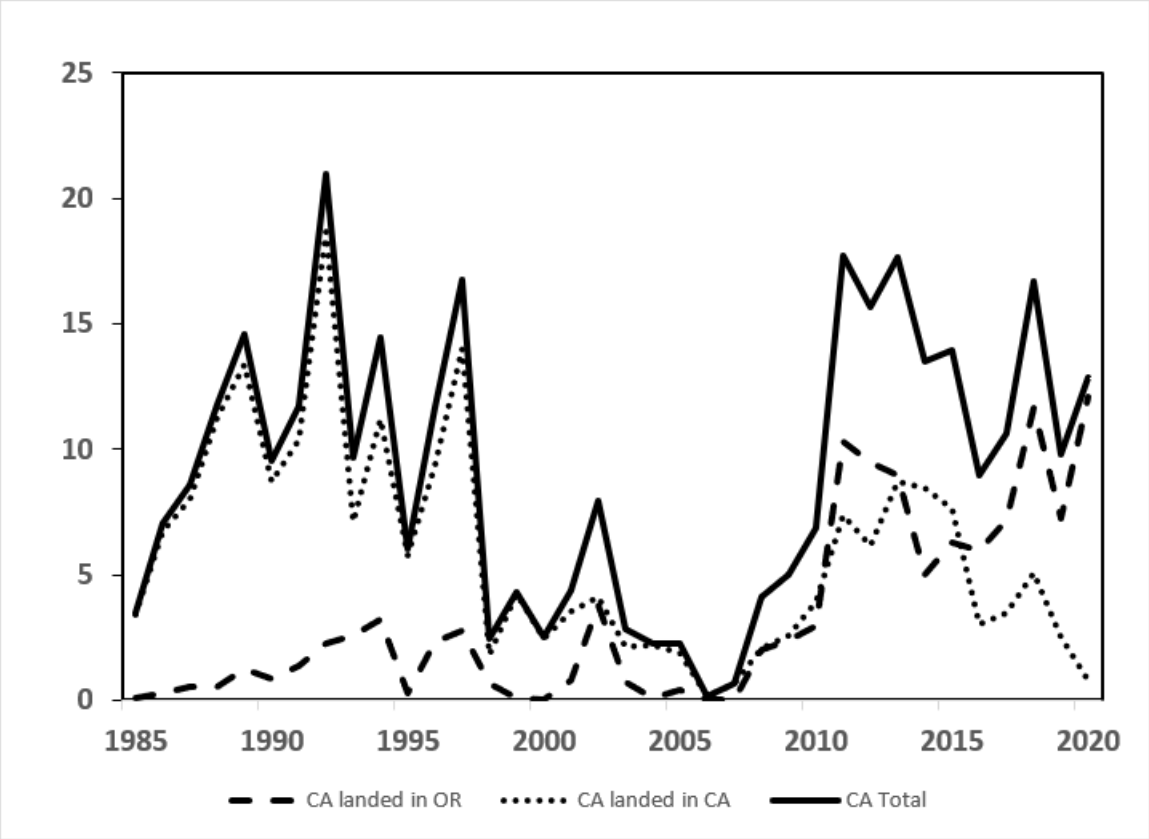

Figure 3. Landing state and weight of landings (million lb) of pink shrimp harvested in California waters, 1985-2020 (Source: CDFW MLDS).

The proposed FMP would establish a harvest control rule for the commercial pink shrimp fishery utilizing catch reference points (June catch per trip) as a proxy for spawning stock biomass in a given year and an environmental indicator (sea level height) as a proxy for recruitment success. The reference points and the environmental indicators were developed by the Oregon Department of Fish and Wildlife (ODFW) and adopted by the Washington Department of Fish and Wildlife. Both states have incorporated these reference points into their pink shrimp FMPs. Use of these reference points by California would ensure uniform coastwide management of this fishery.

The FMP would also establish a requirement for all pink shrimp trawl vessels operating north of Point Conception to attach lights along the footrope of their trawl gear to reduce catch of non-target species. Research by ODFW and Pacific States Marine Fisheries Commission indicates that attaching LED lights on nets reduced eulachon bycatch by 90.5% and juvenile rockfish catch by 78%, with negligible impacts on shrimp retention (Hannah et al. 2015). Because of the threatened status of the southern distinct population segment of eulachon under the federal Endangered Species Act (75 Federal Register 13012), the conservation of this fish species carries an utmost importance in the context of state and federal laws and policy. This effective, low-cost solution to address eulachon bycatch is currently being used voluntarily in California and regulations requiring LED use will be proposed in

connection with this FMP. The adoption of this requirement will also bring California in line with the similar requirements in Oregon and Washington. The requirement only applies to fishing activities north of Point Conception due to the rarity of both pink shrimp and eulachon further south.

The FMP would also prescribe a framework allowing fish businesses to estimate pink shrimp landings while the shrimps are mixed with ice. 14 CCR Section 197 requires landing receipts to be recorded with the accurate weight of any fish landings, and Fish and Game Code Section 8042 further requires seafood processors to pay landing fees by the number of pounds of fish delivered to them by fishermen. However, the fishery has been keeping its catch in ice until processing due to the speed at which the product degrades when out of ice. The new rule would allow the businesses to continue this practice but still maintain accountability under Section 197.

Finally, the FMP will render Subsection 8842(b) of the California Fish and Game code inoperative, as applied to only the pink shrimp fishery once the implementing regulations are in place. This would remove ambiguity about the legality of pink shrimp trawling in state waters and clarify that prior to the authorization of any pink shrimp trawling in state waters the standards specified in 8842 (d) must be met.

8. Surrounding Land Uses and Setting: Briefly Describe Project's Surroundings

There is no recreational fishery for pink shrimp (CDFW 2019). The commercial fishery for pink shrimp has been principally state-managed since 2004, although some federal regulations apply (CDFW 2019). Federal regulations include daily and monthly trip limits for incidental catches of groundfish species, use of a vessel monitoring system, onboard observer coverage, gear restrictions, and area restrictions protecting groundfish essential fish habitat (Code of Federal Regulations Title 50).

Trawling for pink shrimp is currently only allowed in federal waters. State waters were previously open to pink shrimp trawling in what was known as the Pink Shrimp Trawling Grounds (PSTG), which was a specifically defined area in state waters more than two nautical miles from the mainland shore between False Cape (Humboldt County) and Point Reyes (Marin County) (Frimodig et al. 2009). The closure of the PSTG by the **Fish and Game Commission (**Commission**)** in 2008 effectively banning all pink shrimp fishing within state waters (CDFW 2019).

The fishery is currently managed in California using a suite of established regulations (sections 120, 120.1 and 120.2, Title 14, CCR). No quota or catch limits currently exist for pink shrimp, but there is a seasonal closure from November 1 to April 14 to protect egg-bearing females. Additionally, trawl gear must contain a bycatch reduction device and have a minimum mesh size of 1.38 inches (36 millimeters) to allow for escapement of juvenile shrimp and a maximum count of 160 per pound effectively functions as a size limit.

The fishery is currently divided at Point Conception into northern and southern regions to manage fishing effort, with a separate permit required to fish in each

region (14 CCR Section 120.2). The fishery in the northern region is limited entry. The fishery in the southern region is open access. However, regulations are the same for both regions.

Within the northern region, the primary pink shrimp beds have historically been located between Eureka and the Oregon border, in an area immediately north of Fort Bragg. Additionally, commercially harvestable densities of pink shrimp are sometimes present off Morro Bay. In the southern region, lower densities of pink shrimp are sometimes harvested along the mainland in the Santa Barbara Channel.

Historically, pink shrimp fishing activities have occurred off the coast of Del Norte, Humboldt, northern Mendocino, San Luis Obispo, and western Santa Barbara Counties (Figure 4). In more recent years, they have occurred almost exclusively off the coast of Del Norte-Humboldt Counties. For example, in 2019, the last year when there were significant pink shrimp landings in California, over 90% of pink shrimps landed in California were landed **at ports** in Crescent City and Eureka **which are located within Del Norte County and Humboldt County, respectively, and less than 3% of pink shrimps were landed in Morro Bay which is located in San Luis Obispo County** (Figure 5).

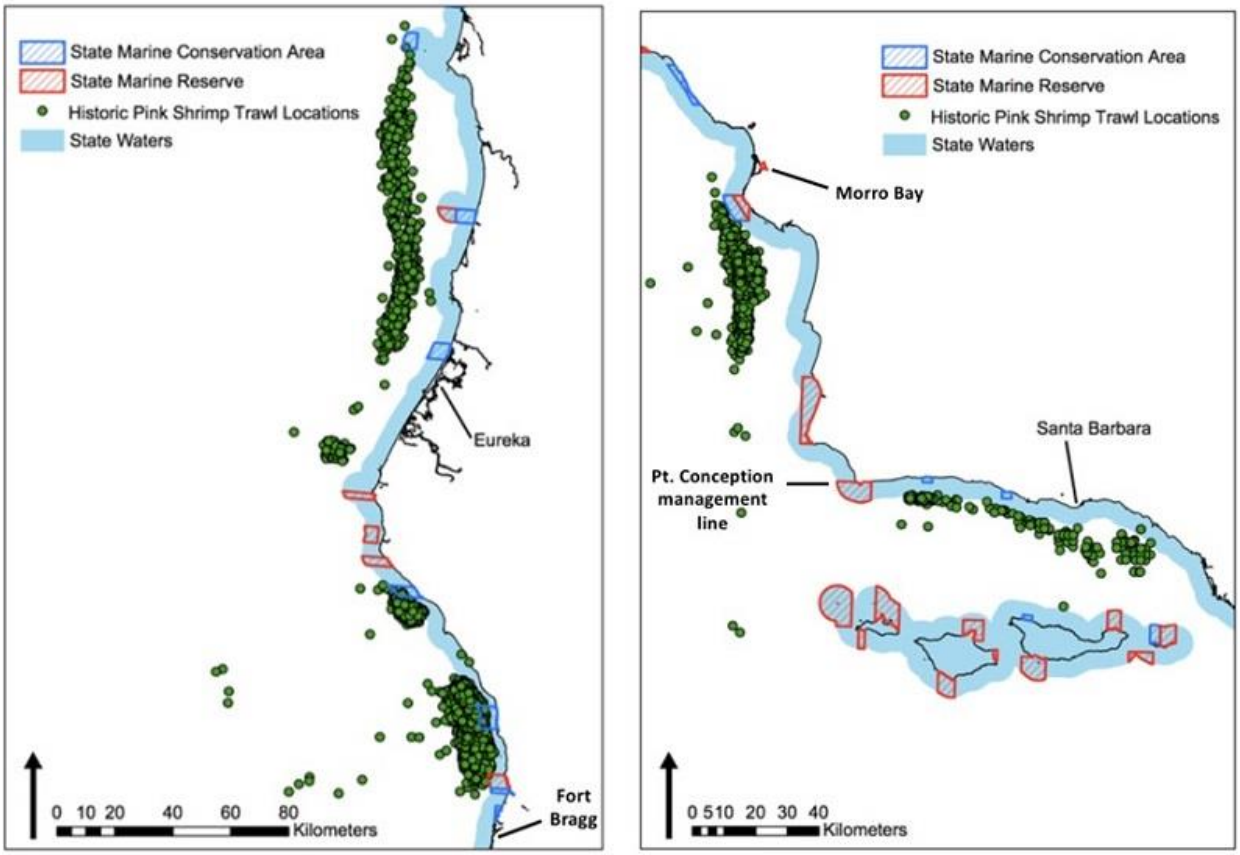

Figure 4. Historical Pink Shrimp trawl locations in (left) northern California and (right) southern California, 1999 to 2007 (CDFW Marine Log System (MLS); note that trawling is no longer allowed in state waters).

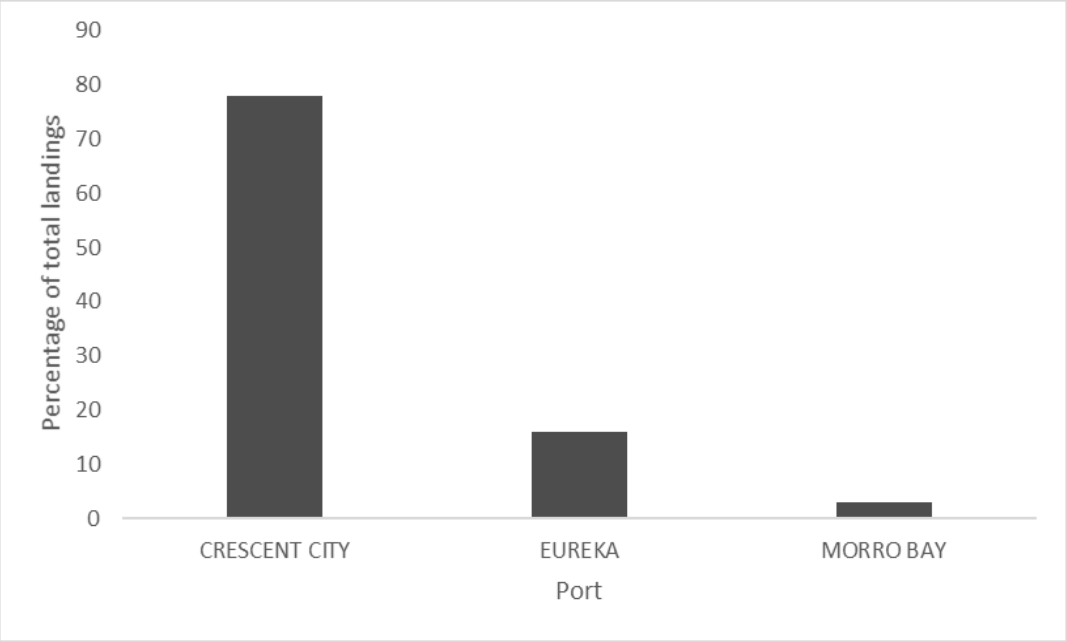

Figure 5. Percentage of California pink shrimp landings by port in 2019 (CDFW Marine Landings Data System).

9. **Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement):** NA

10. **Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code Section 21080.3.1? If so, has consultation begun?** See "Discussion of Checklist," section XVII.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐	Aesthetics	☐	Agriculture and Forestry Resources	☐	Air Quality
☒	Biological Resources	☐	Cultural Resources	☐	Geology /Soils
☐	Greenhouse Gas Emissions	☐	Hazards & Hazardous Materials	☐	Hydrology / Water Quality
☐	Land Use / Planning	☐	Mineral Resources	☐	Noise
☐	Population / Housing	☐	Public Services	☐	Recreation
☐	Transportation/Traffic	☐	Tribal Cultural Resources	☐	Utilities/Service Systems
☐	Mandatory Findings of Significance				

DETERMINATION (To be completed by the Lead Agency)

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☒ I find that the proposed project MAY have a significant effect or potentially significant effect on the environment, and a functional equivalent environmental analysis should be prepared under the Fish and Game Commission's certified regulatory program. (Cal. Code Regs., tit. 14, Section 781.5.)

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Melissa Miller-Henson, Executive Director California Fish and Game Commission	Date

EVALUATION OF ENVIRONMENTAL IMPACTS

1. A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

2. All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3. Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4. "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from "Earlier Analyses," as described in (5) below, may be cross-referenced).

5. Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:
    a. Earlier Analysis Used. Identify and state where they are available for review.
    b. Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
    c. Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7. Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8. This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9. The explanation of each issue should identify:
    a. the significance criteria or threshold, if any, used to evaluate each question; and
    b. the mitigation measure identified, if any, to reduce the impact to less than significance

ISSUES

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
I. AESTHETICS. Would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☐	☒
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒
II. AGRICULTURE AND FORESTRY RESOURCES.	.	.	.	.
In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒
III. AIR QUALITY. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:	.	.	.	.
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☒
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒
IV. BIOLOGICAL RESOURCES: Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and ~~Game~~**Wildlife (CDFW)** or U.S. Fish and Wildlife Service?	☐	☐	☒	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the ~~**California Department of Fish and Game**~~ **CDFW** or US Fish and Wildlife Service?	☐	☐	☒	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
(g) Impact a native fish or wildlife species through authorized take in a commercial or recreational fishing or hunting program?	☒	☐	☐	☐
V. CULTURAL RESOURCES. Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☐	☐	☒	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒
d) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☐	☒	☐
VI. Energy. Would the project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐
VII. GEOLOGY AND SOILS. Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☐	☒

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
VIII. GREENHOUSE GAS EMISSIONS. Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐
IX. HAZARDS AND HAZARDOUS MATERIALS. Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section	☐	☐	☐	☒

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
65962.5 and, as a result, would it create a significant hazard to the public or the environment?				
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒
X. HYDROLOGY AND WATER QUALITY. Would the project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☐	☒
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☒
d) Substantially alter the existing drainage pattern of the site or area, including through	☐	☐	☐	☒

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?				
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☒
f) Otherwise substantially degrade water quality?	☐	☐	☐	☒
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒
XI. LAND USE AND PLANNING. Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒
XII. MINERAL RESOURCES. Would the project:				

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒
XII. NOISE -- Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	☒
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
XIV. POPULATION AND HOUSING. Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
XV. PUBLIC SERVICES.				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒
XVI. RECREATION.				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒
XVII. TRANSPORTATION/TRAFFIC.				
Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of	☐	☐	☐	☒

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?				
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☐	☒
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒
<u>XVIII. TRIBAL CULTURAL RESOURCES</u>				
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in	☐	☐	☐	☒

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Public Resources Code section 5020.1(k), or				
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☐	☒
XIX. UTILITIES AND SERVICE SYSTEMS. Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒
XXI. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☐	☒
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☒	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

Note: Authority cited: Sections 21083 and 21083.05, 21083.09 Public Resources Code. Reference: Section 65088.4, Gov. Code; Sections 21073, 21074 21080(c), 21080.1, 21080.3, 21083, 21083.05, 21083.3, 21080.3.1, 21080.3.2,21082.3, 21084.2, 21084.3, 21093, 21094, 21095, and 21151, Public Resources Code; *Sundstrom v. County of Mendocino,* (1988) 202 Cal.App.3d 296; *Leonoff v. Monterey Board of Supervisors,* (1990) 222 Cal.App.3d 1337; *Eureka Citizens for Responsible Govt. v. City of Eureka* (2007) 147 Cal.App.4th 357; *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th at 1109; *San Franciscans Upholding the Downtown Plan v. City and County of San Francisco* (2002) 102 Cal.App.4th 656.

DISCUSSION OF CHECKLIST

I. Aesthetics. Would the project:

a) Have a substantial adverse effect on a scenic vista?

No Impact. A scenic vista is a view that possesses visual and aesthetic value from singular vantage points that offer unobstructed views of a viewshed, including underlying landform and overlaying landcover and areas designated as official scenic vistas along a roadway or trail. The project area is visible from every State Scenic Highways along the coast (Caltrans 2019). These routes are either official or eligible as California scenic highways and several scenic vistas along the coast. Commercial pink shrimp fishing activities are seasonal and do not leave behind permanent structures. During the open season for the commercial pink shrimp fishery, fishing activities may occur from 3-12 miles from shore. Trawl vessels may appear as elements in the visual setting.

The proposed project would not substantially change the level of fishing activity that currently occurs within the project area. The proposed project will help clarify that shrimp trawling cannot take place in any state waters. Therefore, the FMP would not have a substantial adverse effect on scenic vistas. Therefore, no impact to the visual composition of the existing scenic view would occur.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a scenic highway?

No Impact. The project area is located exclusively within the marine environment. As such, there are no trees or historic buildings within a scenic highway located within the project area. The FMP and regulatory amendments would not substantially change the type or level of fishing activities such that would change the visual composition of an existing scenic resource within a scenic highway. Therefore, no impact would occur.

c) Substantially degrade the existing visual character or quality of the site and its surroundings?

No Impact. The existing visual character and quality of the project area can be characterized as open ocean. The pink shrimp fishery is not currently known to substantially degrade the existing scenery of the coastline, and the FMP and regulatory amendments would not result in substantial changes in the type or level of fishing activities that would degrade the existing visual character or quality of the project site and its surroundings. Therefore, no impact would occur.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

No Impact. The pink shrimp fishery must adhere to regulations set forth by the United States Coast Guard under Rule 26 (33 CFR Section 83.26), which stipulates how lights must be displayed by commercial fishing vessels operating or otherwise transiting at night. While the proposed project would require new footrope lighting devices on all shrimp trawl nets operated north of Point Conception, the lights would be submerged while in operation. More importantly, because pink shrimp are near the sea floor during the day and ascend into the water column at night, fishing vessels only target them using benthic trawl gear during the day when they are concentrated on the seafloor. Therefore, no impact would occur.

II. Agriculture. Would the project:

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program (FMMP) of the California Resources Agency, to non-agricultural use?

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

No Impact. The project is within marine environments, it does not contain any Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as mapped by the FMMP (CDC 2021). The pink shrimp fishery has no effect on terrestrial agriculture, and the project would not cause changes that would result in direct or indirect conversion of these types of farmland. In addition, there is no potential for conflict with zoning for agricultural use or a Williamson Act contract due to the project's location. Furthermore, pink shrimp fishing occurs in waters offshore of northern California, where conditions have not been and are very unlikely to be conducive towards aquaculture. Therefore, no impact would occur.

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code [PRC] section 12220(g)), timberland (as defined by PRC section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

d) Result in the loss of forest land or conversion of forest land to non-forest use?

No Impact. The project area is within marine environments and does not contain any forestland as defined by PRC, nor does it contain timberland, or zoned Timberland Production as defined by the Government Code. The pink shrimp fishery has no effect on forestland or other related resources, and the project would not cause changes that would result in direct or indirect conversion of or conflict with zoning related to forestland types of land uses. Therefore, there is no impact.

e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?

No Impact. The proposed project concerns management of a commercial marine fishery, and no change to land uses in the surrounding terrestrial areas is anticipated. Therefore, no impact would occur.

III. Air Quality. Would the project:

a) Conflict with or obstruct implementation of the applicable air quality plan?

Less than Significant. The purpose of any air quality plan is to reduce criteria and toxic air pollutants in a particular region. These plans can be established by jurisdictional agencies such as air districts or through a general plan document. Typical air quality plans in given air districts address the feasibility and actions that air districts should take to meet or maintain state and federal clean air standards. Air quality plans within general plan documents are usually written as goals, actions, and policies that prohibit or limit land use development actions that would worsen air quality. Any project or plan that would result in short-term or long-term increases in air pollutants would be at risk of conflicting with or obstructing applicable air quality plans. Whether or not an actual conflict would occur depends on the specific limitations presented in the air quality plans and would vary by region.

The proposed project would affect pink shrimp trawling activities at docking locations and offshore along a stretch of coastline that includes the following counties (in order from north to south): Del Norte, Humboldt, Mendocino, Sonoma, Marin, San Francisco, San Mateo, Santa Cruz, Monterey, San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, and San

Diego. These counties are in the following air districts (in order from north to south): North Coast Unified Air Quality Management District (AQMD), Mendocino Air Quality Management District (AQMD), Northern Sonoma County Air Pollution Control District (APCD), Bay Area AQMD, Monterey Bay Air Resource District, San Luis Obispo APCD, Santa Barbara APCD, Ventura APCD, South Coast AQMD, and San Diego APCD. Tables 1 and 2 show the attainment status of each of the coastal counties for state and federal ozone and particulate matter standards (i.e., for particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) and particulate matter less than 10 microns in diameter (PM_{10})) pursuant to the terms of the California Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS).

Table 1. National Air Quality Attainment Statuses at Affected Counties

County	Ozone[a]	PM_{10}	$PM_{2.5}$[b]
Del Norte	Unclassified/Attainment	Unclassified	Unclassified/Attainment
Humboldt	Unclassified/Attainment	Unclassified	Unclassified/Attainment
Mendocino	Unclassified/Attainment	Unclassified	Unclassified/Attainment
Sonoma	Nonattainment (Partial)	Unclassified	Unclassified/Attainment
Marin	Nonattainment	Unclassified	Unclassified/Attainment
San Francisco	Nonattainment	Unclassified	Unclassified/Attainment
San Mateo	Nonattainment	Unclassified	Unclassified/Attainment
Santa Cruz	Unclassified/Attainment	Unclassified	Unclassified/Attainment
Monterey	Unclassified/Attainment	Unclassified	Unclassified/Attainment
San Luis Obispo	Nonattainment (Partial)	Unclassified	Unclassified/Attainment
Santa Barbara	Unclassified/Attainment	Unclassified	Unclassified/Attainment
Ventura	Nonattainment	Unclassified	Unclassified/Attainment
Los Angeles	Nonattainment	Nonattainment (Partial)	Nonattainment (Partial)
Orange	Nonattainment	Nonattainment	Nonattainment
San Diego	Nonattainment (Partial)	Unclassified	Unclassified/Attainment

Table 2. State Air Quality Attainment Statuses at Affected Counties

County	Ozone[a]	PM_{10}	$PM_{2.5}$[b]
Del Norte	Attainment	Attainment	Attainment
Humboldt	Attainment	Nonattainment	Attainment
Mendocino	Attainment	Nonattainment	Attainment
Sonoma	Attainment	Attainment	Attainment
Marin	Nonattainment	Nonattainment	Nonattainment
San Francisco	Nonattainment	Nonattainment	Nonattainment
San Mateo	Nonattainment	Nonattainment	Nonattainment

County	Ozone[a]	PM_{10}	$PM_{2.5}$[b]
Santa Cruz	Nonattainment-Transitional	Nonattainment	Attainment
Monterey	Nonattainment-Transitional	Nonattainment	Attainment
San Luis Obispo	Nonattainment	Nonattainment	Attainment
Santa Barbara	Attainment	Nonattainment	Unclassified
Ventura	Nonattainment	Nonattainment	Attainment
Los Angeles	Nonattainment	Nonattainment	Nonattainment
Orange	Nonattainment	Nonattainment	Nonattainment
San Diego	Nonattainment	Nonattainment	Nonattainment

a.Reflects the national 2015 8-hour standard. The 1-hour standard was revoked on June 15, 2005.

b.Reflects the latest 2012 $PM_{2.5}$ standard.

Source: CARB 2019; USEPA 2018

The proposed FMP would result in an updated management framework for the commercial pink shrimp fishery and would not directly conflict with or obstruct with the implementation of any applicable air quality plans or interfere with a vessel's ability to comply with the Commercial Harbor Craft Regulation (17 CCR Section 93118.5), which regulates the emissions from commercial harbor crafts such as pink shrimp trawl vessels. The project is not expected to change the number of vessels in the fishery. The number of commercial vessels that have landed pink shrimp in California has fluctuated substantially over the years based on a variety of factors. The number of active vessels fluctuated during the 1970s and mid-1990s with a peak in 1994 followed by a nearly steady decline to an all-time low in 2006 (Figure 6). The decline was driven at least in part by a voluntary federal buyout instituted for groundfish trawl vessel permits in 2003, which removed almost half of all trawl vessels on the west coast. Since 2006, the number of active vessels has increased steadily for more than 10 years, despite fluctuation in landings.

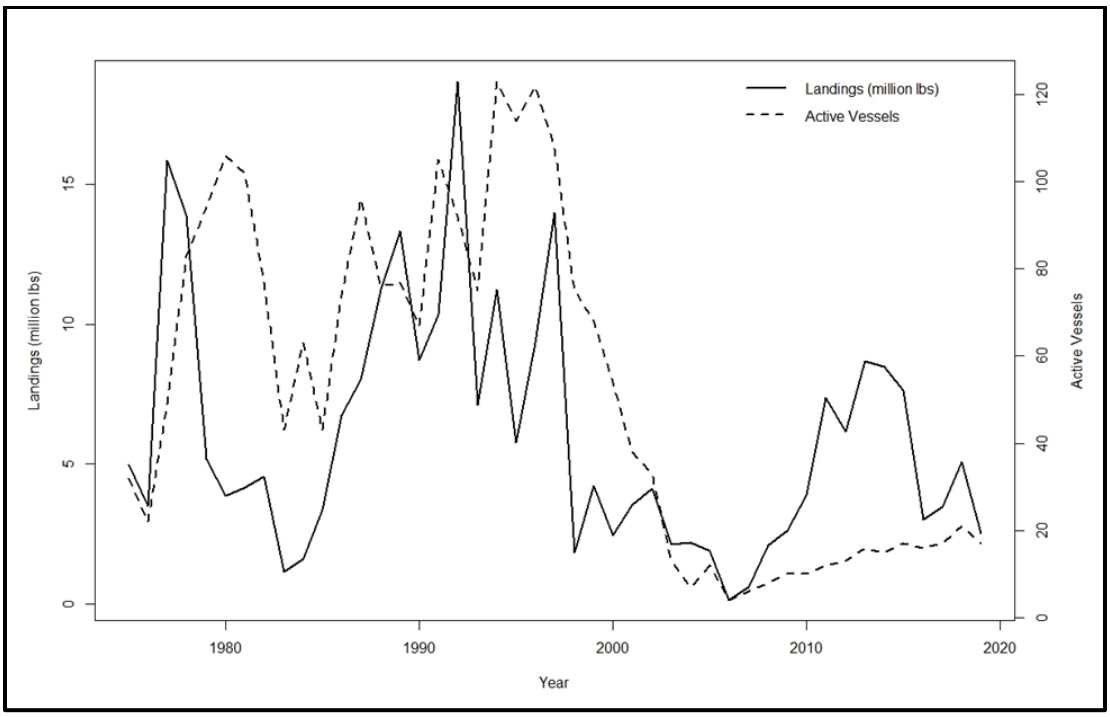

Figure 6. Number of active vessels and landings (million lb) in the California pink shrimp fishery from 1970-2019 (CDFW Marine Landings Data System 2020).

The proposal would implement a harvest control rule that is more restrictive than the current pink shrimp management framework, a footrope lighting device requirement that would marginally increase the cost of each trawl net, a clarification of existing rule, and streamlined weight estimation requirement. None of these changes can reasonably be expected to lead to increased number of participants in a fishery for which participation levels have always fluctuated substantially over time. Therefore, no significant impact is expected.

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Less than Significant. The proposed project is the FMP for the commercial pink shrimp fishery. Movement, concentration, and location of fishing activities under the FMP would remain similar to baseline conditions; therefore, there will be limited emissions resulting from the proposed project. The operation of commercial pink shrimp vessels is not anticipated to exceed the significance thresholds for operational impacts (i.e., emission of nitrogen oxides (NOx), reactive organic compounds (ROG), PM_{10}, and $PM_{2.5}$) in air districts adjacent to the project area (Table 3). In addition, the proposed project will not interfere with a vessel's ability to comply with the Commercial Harbor Craft Regulations. As explained above, the proposed project is not expected to cause the level of fishing activities to increase, and thus would not violate any air quality standard or contribute substantially to an existing or projected air quality violation. Therefore, the impact would be less than significant.

Table 3. Threshold of Significance for Each Affected Air District for Operational Impacts Only

Air District	NOx	ROG	PM_{10}	$PM_{2.5}$
North Coast Unified AQMD[a]	50 lb/day or 40 tons/year	50 lb/day or 40 tons/year	80 lb/day or 15 tons/year	50 lb/day or 10 tons/year

Air District	NOx	ROG	PM_{10}	$PM_{2.5}$
Mendocino County AQMD	42 lb/day	180 lb/day	82 lb/day	54 lb/day
San Luis Obispo County APCD	25 lb/day or 25 tons/year for ROG and NOx combined	25 lb/day or 25 tons/year for ROG and NOx combined	25 lb/day or 25 tons/year	1.25 lb/day (DPM[b])
Santa Barbara County APCD	25 lb/day ROG and NOx combined from motor vehicle trips only	25 lb/day ROG and NOx combined from motor vehicle trips only	APCD New Source Review	APCD New Source Review
Northern Sonoma County APCD	40 tons/year	40 tons/year	15 tons/year	NA
Bay Area AQMD	54 lb/day or 10 tons/year	54 lb/day or 10 tons/year	80 lb/day or 15 tons/year	54 lb/day or 10 tons/year
Monterey Bay Air Resource District	137 lb/day	137 lb/day[c]	82 lb/day	55 lb/day
Ventura APCD	25 lb/day[d]	25 lb/day[d]	NA	NA
South Coast AQMD	55 lb/day	55 lb/day[c]	150 lb/day	55 lb/day
San Diego APCD[e]	250 lb/day or 40 tons/year	75 lbs/day or 13.7 tons/year	100 lb/day or 15 tons/yr	67 lb/day or 10 tons/yr

a. North Coast Unified AQMD has not adopted CEQA thresholds of significance. These thresholds reflect published screening level thresholds for air quality impact analyses for new sources.

b. Threshold for diesel particulate matter (DPM), which is a subset of $PM_{2.5}$.

c. Threshold for volatile organic compounds (VOC), a subset of ROG.

d. Applies to all areas outside of the Ojai Planning Area where the emission thresholds are 5 lb/day for ROG and 5 lb/day for NO_x.

e. San Diego APCD does not provide quantitative thresholds for determining the significance for mobile source-related impacts. However, San Diego APCD does specify Air Quality Impact Analysis trigger levels for new or modified stationary sources that may be used to evaluate emissions which could be discharged in the San Diego air basin from proposed land development projects (County of San Diego 2007).

NA = Not available

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

Less than Significant. Air quality is affected by emissions generated from the operation of gas and diesel engines in commercial fishing vessels. Pollutant emissions released when vessels are underway are influenced by a variety of factors including power source, engine size, fuel used, operating speed, and load. However, the proposed project is the pink shrimp FMP, which is not expected to increase the vessel capacity or change the long-term capacity limit of the fleet. No long-term adverse impacts to air quality are anticipated since no increased vessel

activity is expected as a result of adopting the proposed FMP or implementing regulations. As mentioned, the proposed project would not change any vessel's obligation to comply with the Commercial Harbor Craft Regulation. Thus, the project would not result in a cumulative net increase of any criteria pollutant for which the plan region is in non-attainment under an applicable federal or state ambient air quality standard.

d) Expose sensitive receptors to substantial pollutant concentrations?

No Impact. Sensitive receptors are typically defined as schools, hospitals, residential care facilities, daycare facilities, or other facilities that may house individuals with health conditions that would be adversely impacted by changes in air quality. The proposed project is the Pink Shrimp FMP and proposed regulatory amendments. The project does not propose uses or activities that would result in exposure of these identified sensitive receptors to significant pollutants. Therefore, no impact would occur.

e) Create objectionable odors affecting a substantial number of people?

No Impact. The proposed project involves the Pink Shrimp FMP and regulatory amendments to sustainably manage the pink shrimp resource and improve the long-term sustainability of the fishery in California. The project does not propose any construction or operational impacts that would significantly create objectionable odors affecting a substantial number. Therefore, no impact would occur.

IV. Biological Resources. Would the project:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife **(CDFW)** or the U.S. Fish and Wildlife Service?

Less than Significant. There are a number of special status or otherwise protected species that are known to occur or may occur within the project area. The potential exists for any fish or invertebrate in the area of fishing to be taken. However, the only species that have been documented to have been taken in any notable amount is eulachon (Gustafson et al. 2021), which are not retained by the fishery. The species has comprised a small percentage of the total catch. In 2015, during which the largest number of eulachons were observed as bycatch in a given year, 32.34 mt of eulachon were estimated to have been caught in the fishery (Gustafson et al. 2021), which in turn landed over 3,400 mts of pink shrimp in California that year. To minimize the incidental catch of eulachon, the proposed pink shrimp FMP and its implementing regulation would prescribe the footrope lighting device that have shown to reduce eulachon bycatch by 90.5% (Hannah et al. 2015). As such any impact towards eulachon would be less than significant if not positive.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service?

Less than Significant. Benthic trawling, in which fishing gear is dragged along the bottom of the ocean, can be detrimental to a variety of habitats. Relatively stable habitats, such as hard bottom and dense mud, experience the greatest changes and have the slowest recovery rates compared to less consolidated coarse sediments in areas of high natural disturbance (NRC 2002). Heavy trawling in mud habitats has been shown to decrease invertebrate density and diversity (Hannah et al. 2010). Bottom trawling is known to negatively impact biogenic (habitat-forming) species such as corals, sponges, and sea whips/pens, many of which are slow growing and may take decades to recover if broken or removed by a trawl. The proposed FMP was

developed pursuant to the mandates of MLMA, which requires the state to minimize adverse habitat effects to the extent practicable (FGC Section 7084). The proposed harvest control rule would restrict fishing season based on stock and environmental conditions. As such, the harvest control rule would serve to reduce the impact of trawling.

Furthermore, by clarifying that trawling is prohibited in state waters, the proposed project would help ensure that shrimp trawling does not occur in more stable nearshore habitats. Lastly, the Pacific Fishery Management Council has performed a comprehensive review of the effect of bottom trawling on various bottom habitats within the U.S. Exclusive Economic Zone along the west coast as part of its development of Amendment 28 of the Groundfish Fishery Management Plan (NOAA 2019). The proposed project would not change any fishing vessel's obligation to adhere to the bottom trawl gear prohibition that resulted from the effort, particularly the EFHCA (50 CFR sections 660.11, 660.12, and 660.79). As such any impact would be less than significant.

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

No Impact. The proposed project is the FMP for the commercial pink shrimp fishery. The project would not result in removal, fill, hydrologic interruption, or other activities that would result in a direct substantial adverse effect on federally protected wetlands. Therefore, no impact would occur.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Less than Significant Impact. The proposed project is the FMP for the commercial pink shrimp fishery. As discussed under questions IV (a-c), substantial impacts to habitats and substrates would not occur as a result of the FMP and the subsequent implementing regulations. Furthermore, there have been no documented interactions of threatened or endangered marine birds or mammals in this fishery. The 2019 Groundfish Endangered Species Workgroup Report compiled by the eponymous workgroup of the Pacific Fishery Management Council explored impacts from the groundfish fishery, which encompasses most of the trawling effort on the west coast, on various species listed under the federal ESA (PFMC 2019). During report compilation, the workgroup also received information on take of these species in other fisheries. The pink shrimp fishery was only mentioned as a source of mortality for eulachon and no other species. As such, no substantial interference with movement or effect to native wildlife nursery sites would occur. Therefore, no impact would occur.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

No Impact. There are no Habitat Conservation Plans or Natural Community Conservation Plans within the project area. Jurisdiction of nearby local governments do not extend to the U.S. Exclusive Economic Zone outside of state boundary.

As for state jurisdiction, the Pink Shrimp FMP and proposed regulatory changes have been developed in conjunction with the goals of the MLMA and do not conflict with its provisions. Specifically, the MLMA calls for "conservation, sustainable use, and restoration of California's marine living resources." This includes the conservation of healthy and diverse marine

ecosystems and marine living resource," including the development of FMPs. The FMP and regulatory amendments have been developed as a result of and in accordance with the MLMA policies; therefore, there would be no impact.

(g) Impact a native fish or wildlife species through authorized take in a commercial or recreational fishing or hunting program?

Potentially Significant Impact. The Commission recognizes that any FMP, under appropriate circumstances, would allow for take of a fish species, such as pink shrimp. Any take through fishing effort increases mortality rates to the spawning stock beyond what would naturally occur in the absence of fishing. Out of an abundance of caution, the Commission plans to further evaluate whether the proposed FMP may have significant effects on the pink shrimp population. However, the goal of the FMP is to improve the long-term sustainability of the fishery in accordance with the MLMA by implementing a harvest control rule, and to help reduce bycatch of threatened eulachon through additional gear requirement. The Commission anticipates the potentially significant beneficial impacts to the pink shrimp and eulachon populations.

V. Cultural Resources. Would the project:

a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?

No Impact. The proposed project would not directly or indirectly disturb any historical resources or alter activity around any known historical resources beyond baseline conditions. The pink shrimp fishery occurs offshore above soft bottom already subjected to high levels of natural disturbance due to tides and currents. Therefore, there would be no impact.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

Less than Significant. California law (PRC sections 6313 & 6314) prohibits all unauthorized salvage and removal of artifacts from submerged archaeological sites in state waters, which are under the jurisdiction of State Lands Commission. The State Lands Commission has compiled a database of shipwrecks off the coast of California (CSLC 2021). The proposed project would not conflict with existing state law that protect these resources. Furthermore, the proposed project would not result in additional disturbance to the sea floor. As such it will not increase the risk of disturbance beyond the level that is already occurring. Therefore, any impact would be less than significant.

c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

No Impact. The proposed project would not result in an increase in activities that would directly or indirectly destroy paleontological or geologic features. The proposed project would not result in additional disturbance to the sea floor. Therefore, no impact would occur.

d) Disturb any human remains, including those interred outside of formal cemeteries?

Less Than Significant Impact. The proposed project would not result in excavation or other activities that have the potential to directly or indirectly lead to further disturbance to any known cemeteries or burial grounds beyond existing level of trawling activities. Therefore, any impact would be less than significant.

VI. Energy. Would the project:

a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Less Than Significant Impact. The proposed project would not result in any construction that would require consumption of energy resources. As explained above, the proposed project is not expected to change level of participation and fishing effort in the fishery. The additional restrictions that would be implemented likewise are not expected to cause any effort from existing participants to increase. Therefore, any impact would be less than significant.

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

Less Than Significant Impact. Nothing in the proposed object would alter existing or future obligations of the pink shrimp fishery to comply with relevant laws and regulations, including those related to future plans for renewable energy or energy efficiency. Therefore, any impact would be less than significant.

VI. Geology and Soils. Would the project:

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to California Geological Survey Special Publication 42.

No Impact. The project area is within a marine environment, and implementation of the FMP and regulatory amendments would not include construction of any structures that would directly expose people or structures to rupture of an earthquake fault. It is not anticipated that there would be a direct effect to fishermen regarding substantial adverse effects from rupture of a known earthquake fault from any changes to management of the fisheries from the project Therefore, no impact would occur.

ii) Strong seismic ground shaking?

No Impact. The FMP pertains to the marine environment and would not directly expose or increase existing exposure of people or structures to seismic ground shaking that could occur on land. Therefore, no impact would occur.

iii) Seismic-related ground failure, including liquefaction?

No Impact. The FMP pertains to the marine environment and would not directly expose people or structures to seismic-related ground failure or liquefaction that could occur on land nor increase existing exposure. Therefore, no impact would occur.

iv) Landslides?

No Impact. The FMP pertains to the marine environment and would not directly expose people or structures to landslides that could occur on land or increase existing exposure. Therefore, no impact would occur.

b) Result in substantial soil erosion or the loss of topsoil?

No Impact. The project area is within a marine environment, and soil erosion and loss of topsoil are land-based occurrences. Therefore, the FMP would have no impact on soil erosion or loss of topsoil.

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?

No Impact. The project area is within a marine environment, and unstable soils is a land-based occurrence. Therefore, the FMP would have no impact on unstable soils.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

No Impact. The project does not involve the construction of buildings or structures that would create substantial risks to life or property. Therefore, the FMP would have no impact on expansive soils.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of waste water?

No Impact. The project does not involve the construction of buildings or structures, nor propose the use of septic tanks as part of the FMP. Therefore, the FMP would have no impact on soils incapable of supporting septic tanks.

VII. Greenhouse Gas Emissions. Would the project:

a) Generate greenhouse gas (GHG) emissions, either directly or indirectly, that may have a significant impact on the environment?

Less than Significant. The FMP would not result in an overall increase of fishing activities, and thus no increase of GHG emissions over existing conditions is expected. Trawling is also a seasonal activity, and thus have not and would not incur year-round GHG emissions. Commercial pink shrimp fishing is not expected is increase due to the adoption of this FMP and its implementing regulation. Thus, it would not substantially affect associated fuel combustion above existing conditions. Therefore, any impact would be less than significant.

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Less than Significant. The proposed project is the FMP, which will be implemented in part through regulatory amendments to sustainably manage the pink shrimp resource and improve the long-term sustainability of the fishery. The FMP would not conflict with any adopted plans, policies, or regulations for the purpose of reducing GHG emissions. Therefore, any impact would be less than significant.

VIII. Hazards and Hazardous Materials. Would the project:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Less than Significant Impact. The proposed project is an FMP for the commercial pink shrimp fishery. Commercial fishing for pink shrimp does not generate any hazardous wastes that would create a significant hazard to the public or the environment. Because the level of fishing activities is not expected to change, the levels of waste transport, use, and disposal are not expected to change either. Therefore, any impact would be less than significant.

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials into the environment?

Less than Significant Impact. The proposed project is an FMP for the commercial pink shrimp fishery. Commercial fishing for pink shrimp does not generate any hazardous wastes that would create a significant hazard to the public or the environment. Because the level of fishing

activities is not expected to change, the level of waste spillage due to accidents not expected to change either. Therefore, any impact would be less than significant.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

No Impact. The proposed project is an FMP for the commercial pink shrimp fishery. The fishery does not take place within 3 miles from shore. Therefore, no impact would occur.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

No Impact. The pink shrimp fishery occurs offshore outside of state waters. None of the sites listed by California Department of Toxic Substances would be impacted by fishing activities from the pink shrimp fishery (CDTS 2021). The proposed project would not interfere with cleanup efforts, nor would it exacerbate hazardous conditions at the sites. Therefore, no impact would occur.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

No Impact. Commercial pink shrimp fishing occurs offshore and does not currently interfere with airport operations or air traffic that would result in the exposure of people to a safety hazard. Therefore, no impact would occur.

f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

No Impact. The proposed project is an FMP for the commercial pink shrimp fishery. Commercial pink shrimp fishing occurs offshore and would not interfere with airport operations or result in any changes to the air traffic patterns that would expose people to a safety hazard. Therefore, no impact would occur.

g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

No Impact. The proposed project is an FMP for the commercial pink shrimp FMP. The FMP would not substantially change the level of fishing effort that is currently occurring within the project area. As such, the proposed project would not modify or interfere with any existing emergency response plan or emergency evacuation plan. Therefore, there would be no impact.

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

No Impact. The project area is within the marine environment and is not subject to wildfires. Therefore, no impact would occur.

IX. Hydrology and Water Quality. Would the project:

a) Violate any water quality standards or waste discharge requirements?

No Impact. The proposed project is an FMP for the commercial pink shrimp FMP. There is no known contribution to the degradation of water quality nor is there known discharge of pollutants to the environment associated with pink shrimp commercial fishing. Therefore, no impact would occur.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?

No Impact. The proposed project is an FMP for the commercial pink shrimp FMP. The project occurs within the marine environment and would not affect groundwater supplies or recharge. Furthermore, no facilities constructed with impervious surfaces that could affect groundwater are proposed as part of this project. Therefore, no impact would occur.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial on- or offsite erosion or siltation?

No Impact. The proposed project is an FMP for the commercial pink shrimp FMP. The project occurs within the marine environment. No changes to land use are proposed as part of this project that would modify, either directly or indirectly, existing drainage patterns of any built structures, facilities, or hydrologic features that may exist in the project area in a manner which would result in substantial on- or offsite erosion or siltation. Therefore, no impact would occur.

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in on- or offsite flooding?

No Impact. As discussed under question IX (c), the project occurs within the marine environment and no changes to land use are proposed as part of this project that would affect structures, alter existing drainage patterns or other hydrologic features that could affect existing patterns of surface runoff or result in on- or off-site flooding from surface runoff. Therefore, no impact would occur.

e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

No Impact. As discussed under questions IX (c) and (d), the project is within the marine environment and no land use changes are proposed; as such, there would be no contribution to runoff water that would exceed the capacity of existing or planned stormwater drainage systems. In addition, the project would not result in changes to facilities, impervious surfaces, or other structures or stormwater drainage systems such that runoff volumes, flows, or quality of polluted runoff into stormwater drainage systems would be affected. Therefore, no impact would occur.

f) Otherwise substantially degrade water quality?

No Impact. As discussed under questions IX (a) and (c-d), the project does not propose any land use change nor would it create or contribute to discharge of pollutants into the environment that substantially degrade water quality. Therefore, no impact would occur.

g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

No Impact. No housing is proposed as part of the project. Therefore, would be no impact to housing within a Flood Hazard Boundary or other flood hazard delineation map.

h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows?

No Impact. No structures are proposed as part of the project. Therefore, there would be no impact to the 100-year flood hazard area or flood flows.

i) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?

No Impact. The proposed project is located within the marine environment. There would be no effect related to or from flooding as a result of a levee or dam, as those types of events do not occur in the project area. Therefore, no impact would occur.

j) Inundation by seiche, tsunami, or mudflow?

No Impact. Seiche and mudflow are hazards generated primarily in terrestrial environments that could affect structures and people on land nearby to inland bodies of water and other inland hydrologic features. However, the proposed project involves only commercial fishing activities, any operating fishing vessels in the offshore, open ocean environment would not increase the risk or vulnerability to hazards from inundation by seiche or mudflow. While tsunamis may travel over open ocean, they do not create impact on open cean. Therefore, no impact would occur.

X. Land Use and Planning. Would the project:

a) Physically divide an established community?

No Impact. The proposed project is an FMP for the commercial pink shrimp FMP. The fishery takes place at least 3 nautical miles away from shore. No communities would be divided, either directly or indirectly, from implementation of the FMP and regulatory amendments. Therefore, no impact would occur.

b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

No Impact. The FMP and regulatory amendments would not conflict with any existing land use plan, policy, or regulation because these regulatory changes are focused on management of the fishery which the ~~**Department**~~**Commission** has authority. None of the proposed changes would alter existing obligations that pink shrimp trawl vessels must meet regarding existing state or federal area restrictions. Therefore, no impact would occur.

c) Conflict with any applicable habitat conservation plan or natural community conservation plan?

No Impact. The project area is not subject to a habitat conservation plan or natural community conservation plan. The proposed project involves the preparation of an FMP to sustainably manage the pink shrimp resource and improve the long-term sustainability of the fishery. As mentioned above, activities from the proposed project is not expected to overlap with any of the federal MPAs. Therefore, no impact would occur.

XI. Mineral Resources. Would the project:

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

No Impact. Several oil and gas leases are currently active in federal waters off southern California. The most recent sale occurred in 1984, and no new ones have been proposed (BOEM 2021d). The FMP pertains to the operating of fishing vessels and would not affect the production or extraction of any mineral resources. Fishing vessels would continue to abide by

existing rules concerning existing operations extracting mineral resources, as well as any future operations that may occur. Thus, there would be no loss of any known mineral resources, or preclusion of future access to any mineral resources. Therefore, no impact would occur.

b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?

No Impact. Since no oil and gas extraction sites are located within the project area, the FMP and regulatory amendments would not affect the production or extraction of those resources. Thus, there would be no loss of or preclusion of future access to any mineral resources. Therefore, no impact would occur.

XII. Noise. Would the project:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

No Impact. The proposed project is an FMP for the commercial pink shrimp fishery. The project would not result in any construction activity that would generate noise disturbance nor would it increase noise levels compared to baseline conditions. Therefore, no impact would occur.

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

No Impact. As discussed in question XII (a), the project would not result in any construction or other activities that would generate groundborne vibration or groundborne noise levels. Therefore, no impact would occur.

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

No Impact. The proposed project is an FMP for the commercial pink shrimp fishery. The project would not result in any permanent, fixed noise sources nor would it result in a substantial increase in ambient noise levels in the project vicinity above baseline conditions. Therefore, no impact would occur.

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

No Impact. The proposed project is an FMP for the commercial pink shrimp fishery. No construction is proposed a part of the project that would result in temporary or periodic noise disturbances. Therefore, no impact would occur.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. The proposed project involves the preparation of a Pink Shrimp FMP to sustainably manage the pink shrimp resource and improve the long-term sustainability of the fishery. There would be no substantial effect on the existing noise conditions from implementation of the proposed project. In addition, the project is offshore and not located near sensitive receptors. Therefore, no impact would occur.

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. Similar to question XII (e), there would be no substantial effect on the existing noise conditions from implementation of the proposed project and no sensitive receptors would be located near the vicinity of a private airstrip. Therefore, no impact would occur.

XIII. Population and Housing. Would the project:

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

No Impact. The FMP would not include construction of new housing or commercial businesses. Therefore, no direct population growth would result from implementation of the FMP or regulatory amendments. In addition, the proposed changes would not require or indirectly cause any new construction or any infrastructure modification, and no additional temporary or permanent staff would be needed for operations and maintenance of the fishery. Therefore, no impact would occur.

b) Displace substantial numbers of existing homes, necessitating the construction of replacement housing elsewhere?

No Impact. The FMP would not remove any homes or require construction of replacement housing. Therefore, no impact would occur.

c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

No Impact. The FMP would not displace any people or require construction of replacement housing. Therefore, no impact would occur.

XIV. Public Services. Would the project:

a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

Fire protection?

No Impact. No construction of any new government facilities or the alteration of any existing government facilities that would increase the demand for fire protection services is proposed as part of the project. In addition, the project area is within the marine environment and the potential for fires would be limited to those on board of fishing vessels. The FMP and regulatory amendment would not substantially increase the amount of vessels in the project area or the demand for fire services. Therefore, no impact would occur.

Police protection?

No Impact. The FMP would not involve the construction of any new government facilities or the alteration of any existing government facilities that would increase the demand for police protection services. In addition, the FMP would not substantially increase the amount of vessels in the project area or the demand for police or other law enforcement services. Therefore, no impact would occur.

Schools?

No Impact. The FMP would not involve the construction or alternation facilities that would increase the demand for schools. Therefore, no impact would occur.

Parks?

No Impact. The FMP would not involve the construction or alteration of any facilities that would increase the demand for parks. Therefore, no impact would occur.

Other public facilities?

No Impact. The FMP would not involve the construction or alteration of any facilities that would increase the demand for other public facilities. Therefore, no impact would occur.

XV. Recreation. Would the project:

a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

b) Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

No Impact. The proposed project would not result in increased use of recreational facilities in neighborhood or regional parks above existing conditions. Pink shrimps are not targeted recreationally, and as such no recreational facility is involved. As a result, no new construction or expansion would be required. Therefore, no impact would occur.

XVI. Transportation/Traffic. Would the project:

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

No impact. The proposed project would not conflict with any plans or policies related to circulation. The FMP and regulatory amendments would not conflict with the performance of existing circulation systems for traffic. Therefore, no impact would occur.

b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

No Impact. The proposed project is located within the marine environment and is not subject to any congestion management program for roads or highways. Therefore, no impact would occur.

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

No Impact. The proposed project is within the marine environment and implementation of the project would not affect any air traffic patterns. Therefore, no impact would occur.

d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

No Impact. No new facilities would be constructed under the FMP, and implementation of these changes would not involve any design feature related to any transportation of traffic-related infrastructure. Therefore, no impact would occur.

e) Result in inadequate emergency access?

No Impact. The proposed project would not change emergency access within the project area. Therefore, no impact would occur.

f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

No Impact. The proposed project is located within the marine environment. The FMP would not affect adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities. Therefore, no impact would occur.

XVII. Tribal Cultural Resources. Would the project:

a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code **(PCR)** section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or

ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?

No Impact. Tribal representatives are considered experts appropriate for providing substantial evidence regarding the locations, types, and significance of tribal cultural resources within their traditionally and cultural affiliated geographic area (PRC Section 21080.3.1(a)). In accordance with Assembly Bill (AB) 52, the Commission and CDFW jointly notified Native American tribes whose interests or cultural affiliations coincide with the project's area of potential effects, as identified by the Native American Heritage Commission (NAHC). The tribes were sent notification letters on October 22, 2021, informing them of the proposed project and asking them of any knowledge or information about tribal cultural resources they may have. To date (November 15, 2021), neither the Commission nor CDFW have received any responses to these notification letters. Moreover, a search of the Sacred Lands File (SLF) that would identify any tribal cultural resources or sacred lands in the project's area of potential effect was requested by the CDFW; however, NAHC indicated that a records search cannot be conducted as the project is located outside of the SLF search area (NAHC, personal communication, August 23, 2021).

Both the Commission and CDFW are committed to open communication with Tribes under their respective consultation policies (CDFW's Tribal Communication and Consultation Policy, which is available through the CDFW's Tribal Affairs webpage at https://www.wildlife.ca.gov/General-Counsel/Tribal-Affairs; Commission's Tribal Consultation Policy, which is available through the Commission's Policies webpage at http://www.fgc.ca.gov/policy/p4misc.aspx#tribal). **Prior to the October 22, 2021, notification letter,** CDFW has initiated communication with ~~t~~**T**ribes on issues concerning pink shrimp management on July 10, 2021. ~~**Department**~~ **CDFW** staff received a ~~**response**~~ **request for additional information** from **a representative of** the Rincon Band of Luiseño Indians **(Tribal Representative)** ~~**requesting further discussion**~~ on August 6, 2021. ~~**Department**~~ **CDFW** staff then held a discussion with **the Tribal** Representative ~~**from the tribe**~~ on August 31, 2021. During the discussion, staff explained to the **Tribal** Representative the fishery's background and the details of the proposed project. **While no tribal cultural resources issues were specifically identified,** ~~**T**~~ **t**he **Tribal** Representative raised some **general** concerns over the environmental impact of trawl fishing ~~**generally, and**~~**.** ~~**Department**~~

CDFW staff ~~**reassured the Representative**~~ **clarified** that **the project does not propose to open any new trawling grounds; therefore,** shrimp trawling will continue to be prohibited inside state waters.

XVIII. Utilities. Would the project:

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

No Impact. The proposed project is an FMP for the commercial pink shrimp fishery. No land use changes or development are proposed as part of the project which would generate wastewater requiring treatment. Therefore, no impact would occur.

b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

No Impact. The FMP would not include any facilities that would require water and would not increase the demand for water. In addition, the proposed project would not result in impact related to construction of new or expanded wastewater treatment facilities. Therefore, no impact would occur.

c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

No Impact. The proposed project is an FMP for the commercial pink shrimp fishery. Implementation of the project would not result in land use change or development that would generate stormwater that would require the construction of new storm water drainage facilities or the expansion of existing facilities within the project area. Therefore, no impact would occur.

d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

No Impact. The FMP would not include any facilities that would require water and would not increase the demand for water. Therefore, no impact would occur.

e) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand, in addition to the provider's existing commitments?

No Impact. See discussion under XVIII (a). There would be no impact related to wastewater treatment capacity.

f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

No Impact. Although some solid waste is generated with fishing activities, implementation of the FMP and regulatory amendments would not result in an overall increase in solid waste generated by the fishery. Therefore, there would be no impact on landfill capacity.

g) Comply with federal, state, and local statutes and regulations related to solid waste?

No Impact. The FMP would not result in a change in compliance with solid waste regulations. Therefore, no impact would occur.

h) Interfere with utilities?

No Impact. Fishing activities are not known to interfere with underwater cable or other submerged utilities. Therefore, no impact would occur.

XIX. Mandatory Findings of Significance.

a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare, or threatened species, or eliminate important examples of the major periods of California history or prehistory?

No Impact. As evaluated in this Initial Study, the proposed project would not substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare, or threatened species, or eliminate important examples of the major periods of California history or prehistory. The proposed FMP would benefit the Pink Shrimp fishery by adaptively managing it to ensure the long-term health of the resource. The proposed management changes, which include the implementation of harvest control rule, the footrope lighting device requirement, and the clarification of prohibiting bottom trawling within state waters all serve to protect the environment and conserve natural resources.

b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)

Less Than Significant Impact. The potential for adverse cumulative effects were considered in the response to each question in sections I through XIX of this Initial Study. The Bureau of Ocean Energy Management is in the process of considering an offshore wind energy project off southern Humboldt County and Morro Bay (BOEM 2021a). In its 2021 SB 100 Joint Agency Report in March 2021 (CEC 2021), the state specifically noted fishing as a competing use for offshore wind energy development. However, the currently proposed area for the wind energy project is placed beyond the depth of pink shrimp habitat (BOEM 2021b; BOEM 2021c). Furthermore, nothing in the proposed project would change the fishery's obligation that may arise from the approval of these projects.

On a separate note, one of the main impetuses for the development of the project is to help the pink shrimp fishery in California obtain the Marine Stewardship Council (MSC) certification. The certification of the fishery in Oregon but not California is the primary reason why fishing vessels that harvest shrimp off California often choose to make a longer trip into Oregon ports to land their catch (Figure 3). By adopting the FMP and incorporating the same harvest control rule that Oregon and Washington adopted, the Department is expecting to help its fishery obtain MSC certification.

It is important to note that the MSC certification is performed by a private third-party and is not guaranteed by the adoption of the FMP. Even if the certification effort is successful, the overall level of fishing activities is not expected to increase. As Figure 7 shows, while the number of vessels landing in California did rise following Oregon's MSC certification in 2007, it did so very slowly and bore no relation to the amount of landings, not to mention that around that time, landings increased in both Oregon, where the fishery is MSC-certified, as well as California, where the fishery is not. More importantly, when Washington was certified in 2015, the slow increase in the number of vessels did not accelerate. This suggests that the number of vessels willing to participate in the fishery is likely determined by factors other than MSC certifications. California's potential MSC certification is thus unlikely to affect the overall number of fishing vessels in the ocean.

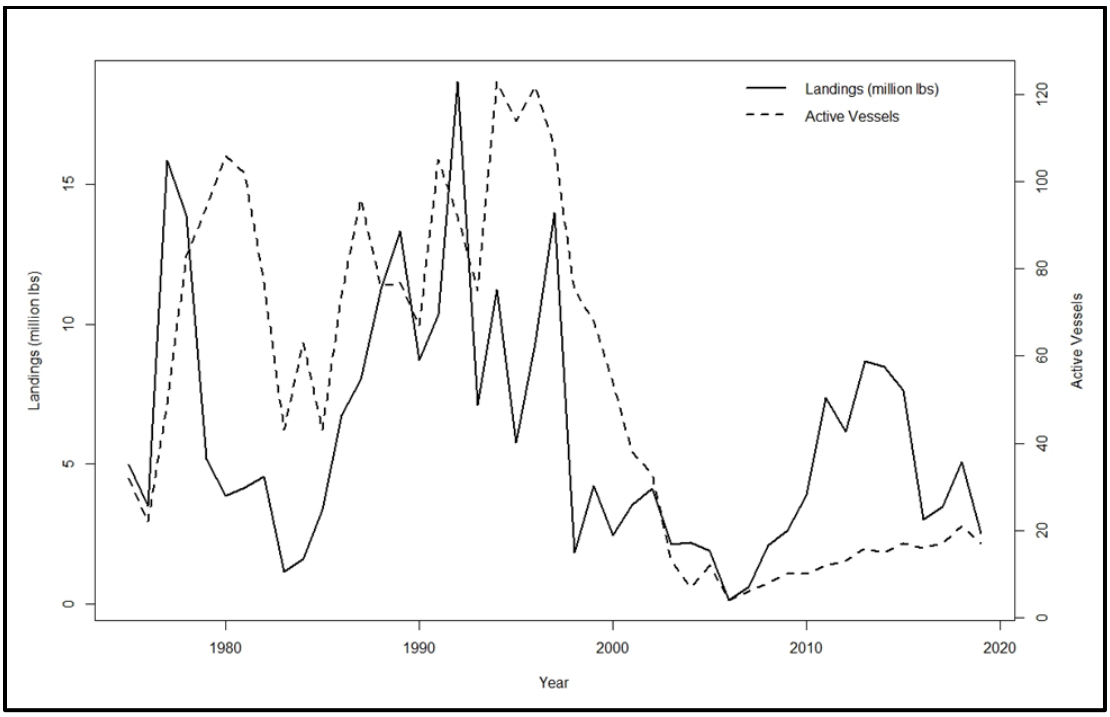

Figure 7. Number of active vessels and landings (million lb) in the California pink shrimp fishery from 1970-2019 (CDFW Marine Landings Data System 2020).

As a result of this evaluation, there is no substantial evidence that there are adverse cumulative effects associated with the proposed project that would have significant impacts or require mitigation. Pursuant to the MLMA, this project in combination with past, present, and probable future projects would contribute to the conservation of marine ecosystems and marine living resources. Therefore, the proposed project would not add considerably to any cumulative impacts in the region. Therefore, cumulative impacts would be less than significant.

c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?

No Impact. The potential for adverse direct or indirect impacts to human beings were considered in the evaluation of environmental impacts for certain questions in sections I, III, VI, VIII, IX, XII, XIII, and XVI of this Initial Study. As a result of this evaluation, the proposed project would not have environmental effects that would cause substantial adverse direct or indirect effects on human beings. Therefore, no impact would occur.

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