

Image: Whitehead et al. 1988 via FAO

## Risk Assessment for Sourcing Seafood (RASS) profiles; Peruvian Anchoveta (*Engraulis ringens*) artisanal purse seine fishery in Northern Central Peru (FAO 87).

### Introduction

This document is a summary of information for the Peruvian artisanal purse seine fishery targeting Peruvian Anchoveta (Anchoveta) within FAO area 87.1.13-14 (Figure 1). Fish populations are divided into fish stocks. A fish stock is a sub

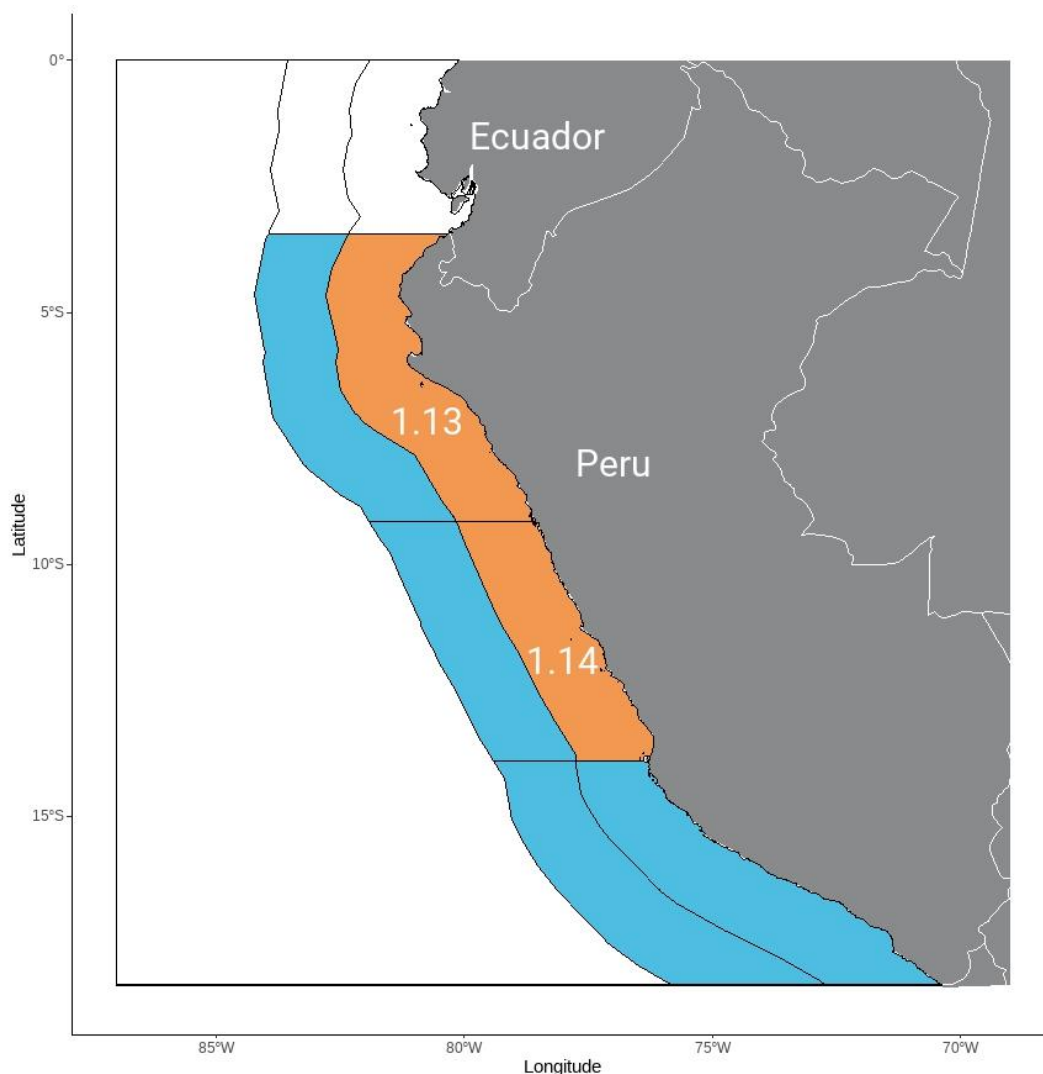


Figure 1. Map showing the FAO Fisheries regions off the coast of South America. The areas highlighted in orange are the areas related to the artisanal fishery. The blue shows the extent of the Northern Central stock.

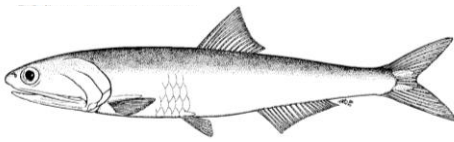


Image: Whitehead et al. 1988 via FAO

population of a fish species which inhabits a defined area of sea. Fish stocks are the units used by scientists and governments to assess and manage stock sustainability, so each RASS parent profile<sup>1</sup> relates to assessment and management of a specific stock within a defined sea area shown on the maps. Profiles may also refer to nested child fisheries for management, bycatch and habitat scores.

RASS applies a framework which scores ([RASS Scoring Guidance version 2](#)) risk levels for stocks on a five-point scale; from one very low risk to five very high risk, as indicated by the number of solid blue circles shown on the profiles below. Four aspects are assessed for this fishery:

1. The stock status as advised by the Marine Research Institute of Peru (IMARPE) is done in “real time”, before and during the fishing season<sup>2</sup>. The assessment score is for the parent fishery, that is the entire fishery on this stock.
2. Stock management, using information from the Ministry of Production (PRODUCE) and other sources<sup>3</sup>. The assessment score is for the parent stock with some reference to the nested artisanal fishery (child fishery).
3. Bycatch of vulnerable resource and Endangered, Threatened or Protected (ETP) species and mitigation measures using scientific literature and other sources. The assessment score is for the parent fishery.
4. Habitat impacts of the fishery and mitigation measures using scientific literature and other sources. The assessment score is for the parent fishery.

Scores should not be used in isolation to decide on a purchase of seafood from a stock. Profiles are designed to:

- Enable the main features of a stock and fishery to be examined within a structured format
- Inform buyers of questions they might ask about a stock and fishery and where sustainability improvements could be made

Inevitably there are several technical terms used. Please see the Glossary at the end of the document, where there are also links to further reading.

---

<sup>1</sup> See RASS Scoring Guidelines for definitions of parent and child fisheries

<sup>2</sup> [Instituto del Mar del Perú - IMARPE - Plataforma del Estado Peruano \(www.gob.pe\)](http://www.gob.pe)

<sup>3</sup> [Ministerio de la Producción - PRODUCE - Plataforma del Estado Peruano \(www.gob.pe\)](http://www.gob.pe)

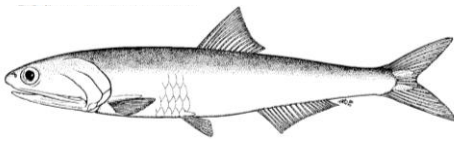


Image: Whitehead et al. 1988 via FAO

## Overview of Anchoveta<sup>4</sup>

Morphology is general of all Pacific *Anchoa*. Distribution is highly dependent on oceanographic conditions but is typically found from Aguja point Peru, southward to Chiloe, Chile. Species migrates diurnally, descending to depths of up to 50m in daylight mainly within 80km of the coast. Species aggregates in huge schools, mixing with populations of Longnose Anchovy (*Anchoa nasus*), which is also a target species. Anchoveta breeds throughout the year along its entire distribution, the main spawning season is between July- September. Maturity is reached at one year (10cm), longevity is around three years.

## Stock Structure

Biological stock unit for Anchoveta is the Peruvian Northern-Central. There is a southern stock that crosses over into Chilean waters which is not considered in this report.<sup>5</sup> The Northern-Central stock extends north of 16°S to 03°30'S. Peak biomass

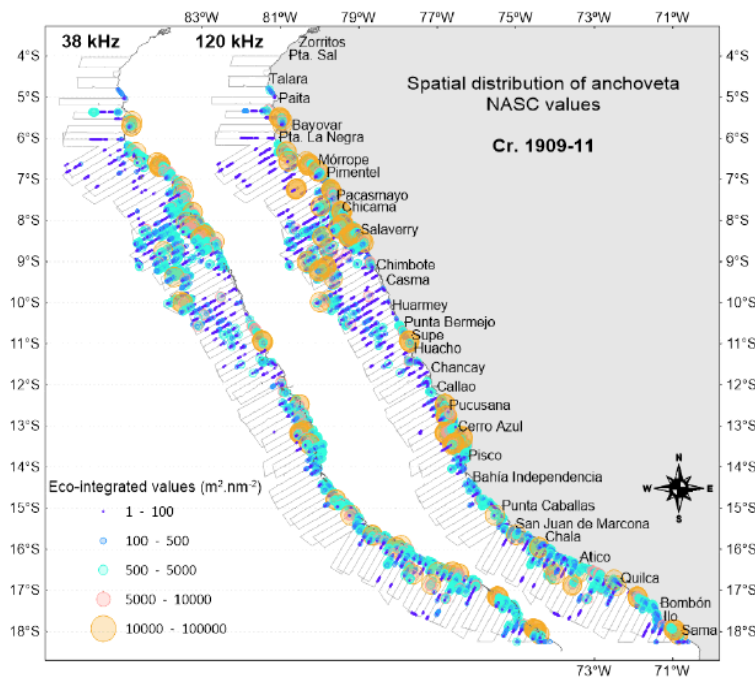


Figure 2. Spatial distribution and density of Peruvian Anchoveta estimated using two different acoustic frequencies. Cruises were conducted in 2019. *Castillo R, Aparco LLC, Grados D, Cornejo R, Guevara R, et al. (2020) Anchoveta (Engraulis ringens) Biomass in the Peruvian Marine Ecosystem Estimated by Various Hydroacoustic Methodologies*

<sup>4</sup> Whitehead, P.J.P., G.J. Nelson and T. Wongratana, 1988. FAO Species Catalogue. Vol. 7. Clupeoid fishes of the world (Suborder Clupeoidei). An annotated and illustrated catalogue of the herrings, sardines, pilchards, sprats, shads, anchovies and wolf-herrings. FAO Fish. Synop. 125(7/2):305-579. Rome: FAO.

<sup>5</sup> Pauly, D.; Ruiz-Leotaud, Valentina (2018) Marine and Freshwater Miscellanea. Fisheries Centre Research Reports 26(2): 83 pp

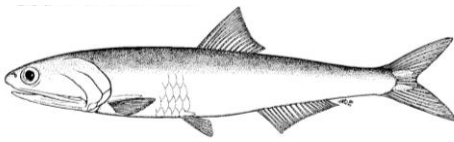


Image: Whitehead et al. 1988 via FAO

estimates are towards the northern end of the stock [Figure 2](#). The surveys were also able to estimate length frequencies. Northern range of the stock is heavily influenced by oceanographic factors. El Niño events cause a “tongue” of warm water to extend south affecting phytoplankton availability. This limits the range of stock during the events. The Northern-Central stock is entirely within Peruvian waters and is solely managed and fished by them.

## Overview of Artisanal Fishery

The stock is targeted by three distinct purse seine fleet segments. Artisanal, small-scale, and industrial. The artisanal and small-scale fishery can only target fish for human consumption whereas the industrial fleet can catch for the fishmeal/fish oil market. Vessels classified as “artisanal” must have a GRT (Gross Register Tons) of less than 10 and must fish within 5nm of the coast (but outside 3nm).<sup>6</sup> All artisanal vessels must use a minimum of a 13mm mesh and fishing process must be un-mechanised.

Peru has two major fishing seasons. For the Northern-Central, the first fishing season is April-July and the second fishing season is November-January. These seasons are only “reference” seasons as this can vary significantly depending on pre-season assessments.

There is a stage five FIP in place for the artisanal fleet that is on track to achieve a certifiable status by December 2024.<sup>7</sup>

## RASS Scoring

### Stock status Peruvian Anchoveta Northern-Central and Southern Stock – Peru



**The stock is assessed as Very Low Risk. Spawning stock biomass (SSB) is above SSB<sub>MSY</sub> and fishing pressure (F) is consistently below F<sub>MSY</sub>.**

Exploitation is recommended at <0.35, meaning no more than 35% of biomass is fished each season. Biomass is assessed acoustically pre and post season, including distribution and densities.<sup>8</sup> Four different capture scenarios are modelled each year in relation to biomass targets and limits. Stock composition of juveniles is also assessed every season as well as oceanographic conditions that may impact spawning and stock health. An egg survey is carried out post season to inform on

<sup>6</sup> [2016\\_09\\_Peruvian anchovy DHC FIP\\_CeDePesca Public report.pdf \(fisheryprogress.org\)](#)

<sup>7</sup> [Peru anchovy - small scale purse-seine | Fishery Progress](#)

<sup>8</sup> [Anexo - Proyecto de Oficio 339-2021-IMARPE.pdf \(www.gob.pe\)](#)

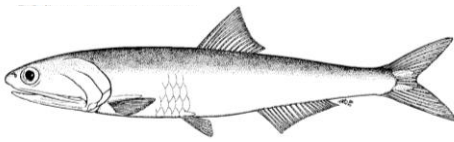


Image: Whitehead et al. 1988 via FAO

potential recruitment the following year. More extensive stock assessments have been recommended but are not used.

## Stock management

### Peruvian Anchoveta Northern-Central and Southern Stock – Peru

●●○○○ **Low Risk**

**The stock management is assessed as Low Risk. TACS, spatial and transitory closures are all used based on comprehensive and precautionary assessments. Monitoring is extensive and has highlighted some infringements.**

#### Technical Measures

To address issues with unregistered fishing and processing individual vessel TACs were introduced, however there is still “illegal” fishing taking place. There is independently verified annual surveys pre, during and post season that inform adaptive management measures. Transitory closures are used to protect juveniles as well as allowing exploratory fishing early in the season before allowing full fleet access. This is a precautionary approach used when juvenile “bycatch” is deemed too high. Seasons have historically been cancelled due to low biomass. Effort is also managed differently within 10nm (small scale and artisanal only) and within five nautical miles (artisanal only). There is no fishing permitted within three nautical miles of the coast. Management also only allows the industrial fleet to catch for fishmeal and fish oil processing, the rest must be for human consumption. The Northern-Central stock is managed and fished exclusively by Peru, the Southern stock is shared with Chile. There are two separate observer programmes in place to sample catches, digital log books, IVMS monitoring and onshore sampling.

#### Advised and agreed catches.

Alternative catch levels, instead of explicit catch are given. Four projections are made based on different environmental scenarios (from favourable to unfavourable), exploitation rates, and unfished biomass. TAC uptake is very quick, on average >80% of quota is used within the first 10 weeks of a season.<sup>9</sup> TACs are agreed pre-season and have remained below E0.35, which is expected to maintain biomass above the Target Reference Point (TRP) of 6million metric tonnes (mt). Biomass has not been below 20% over the TRP since 2000<sup>10</sup> Primary fluctuations in biomass and landings are consistent with El-Niño patterns as opposed to fishing pressure. TAC for the

<sup>9</sup> [Protocol tabla\\_decision\\_anchoveta.pdf \(www.gob.pe\)](#)

<sup>10</sup> [FisheryProgress\\_Three\\_Year\\_Evaluation\\_Template\\_November2022\\_FINAL\\_Peru\\_anchovy\\_small\\_scale\\_purse\\_seine\\_june2023.pdf](#)

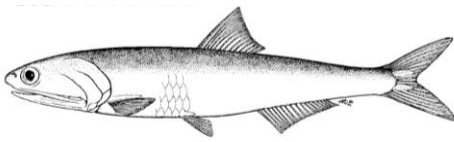


Image: Whitehead et al. 1988 via FAO

artisanal and small-scale fleet crosses stock boundaries, but advice is in place for managing this sector. Management retains 2.2% of quota as a “contingency stock”.

### **Stock harvesting strategy**

Management principles are focused on maintaining SSB by controlling extraction rates. Pre-season assessments of biomass, levels of juveniles within shoals and length distributions directly inform TAC. Spatial and temporal closures are used to protect juveniles, which can happen mid-season as well as pre-season. Monitoring is real-time and highly reactive. Vessels are split into several fleets for management purposes, including targeting for human direct and indirect consumption. The Northern Central stock is managed and exploited exclusively by Peru within their territorial waters.

### **Surveillance and enforcement**

In line with the FIP, for both the small scale and industrial fishery, observer programmes have been implemented to monitor and verify catches and discards. There was a recognised issue of unpermitted fishing, so electronic logbooks were introduced to remove the incentive for unreported landings, as well as individual vessel quota (which are non-transferable). The FIP has acknowledged a decrease in the occurrence of unregulated fishing.

The industrial fleet is required to sample 100 fish per day per vessel and send results to IMARPE and PRODUCE daily. All landings are sampled and the observer programme has a 5% fleet coverage. IVMS is also mandatory for monitoring purposes.

## **Stock management of nested fishery (Artisanal Fleet)**



**Stock management for the nested fishery is assessed as Very Low Risk. Artisanal fleet is responsible small part of total effort. A separate TAC assigned to the artisanal fleet was introduced in 2017. TAC in 2022 was 150,000mt which is less than 3% of the TAC for the entire fishery.<sup>11</sup>**

<sup>11</sup> PRODUCE. 2022a. Resolución Ministerial N° 00190-2022-PRODUCE. Establecen Límite Máximo Total de Captura para Consumo Humano Directo (LMTC-CHD) del recurso anchoveta para el año 2022. <https://cdn.www.gob.pe/uploads/document/file/3179241/RM%20N%C2%BA%20190-2022-PRODUCE.pdf.pdf>

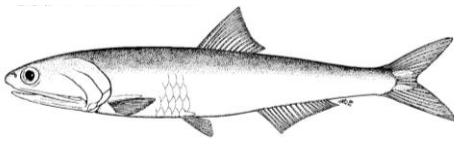


Image: Whitehead et al. 1988 via FAO

## Bycatch of the nested fishery (Artisanal Fleet)

● ○ ○ ○ ○ **Very Low Risk**

**Bycatch is assessed as Very Low Risk. Very little non target bycatch and incidental bycatch of ETP species results in low mortality rates.**

As anchoveta is a key prey species, reduction in bycatch of species which predate on anchoveta was a primary aim of the FIP. There is a fishery wide bycatch limit of 5% of total catch, on board observations have shown bycatch levels as low as 1.02%. Bycatch was initially reported by independent observers but now the Salvamares programme reports directly from the industry.<sup>12</sup> CeDePesca includes bycatch incidents on FIP vessels in their annual reporting.<sup>13</sup> There are reports of interactions with cetaceans, pinnipeds, seabirds, turtles, and a variety of fish species. However, mortality events are low.

### **Gear effects.**

Fishery exclusively employs purse seines with a minimum mesh size of 13mm so selectivity for non-target species is low. But due to the large shoaling behaviour of anchoveta, they dominate catches across the fishery.

### **Evidence of bycatch risk - Secondary Species**

*Anchoa nasus* (Samasa/Long-nose Anchovy) has no clear biomass benchmark and TAC is included in with anchoveta, bycatch rates average 0.341%. Biomass of samasa shows a negative correlation with anchoveta so controls rules in place will also preserve strong year classes of samasa.<sup>14</sup>

### **Evidence of bycatch risk - ETP Species**

There are two kinds of ETP interactions, direct and indirect. Direct are any interactions where individuals come into contact with the gear.

---

<sup>12</sup> The Salvares programme uses trained crew to report on bycatch and discards.

<sup>13</sup> [Peruvian Anchovy \(Indirect Human Consumption\) - Centro Desarrollo y Pesca Sustentable \(cedepesca.net\)](#)

<sup>14</sup> [FisheryProgress\\_Three\\_Year\\_Evaluation\\_Template\\_November2022\\_FINAL\\_Peru\\_anchovy\\_small\\_scale\\_purse\\_seine\\_june2023.pdf](#)

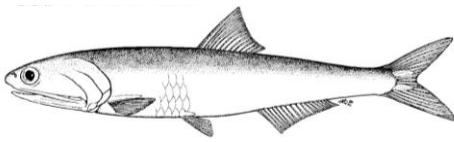


Image: Whitehead et al. 1988 via FAO

Table 1 Reports of ETP interactions provided by Salvamares in the first season of 2019. IUCN Ratings: Least Concern (LC), Vulnerable (VU), Near Threatened (NT), Endangered (EN), Critically Endangered (CR).

Common Name	Scientific Name	IUCN Rating	Number of individuals	Mortalities
<b>Common Dolphin</b>	<i>Delphinus delphis</i>	LC	12	1
<b>Bottlenose Dolphin</b>	<i>Tursiops truncatus</i>	LC	51	0
<b>Dusky Dolphin</b>	<i>Lagenorhynchus obscurus</i>	VU	24	0
<b>South American sea lion</b>	<i>Otaria byronia</i>	LC	123,306	53
<b>South American fur seal</b>	<i>Arctocephalus australis</i>	LC	7,612	2
<b>Peruvian booby</b>	<i>Sula variegata</i>	LC	222,259	0.22%
<b>Peruvian pelican</b>	<i>Pelecanus thagus</i>	NT	144,545	
<b>Sooty shearwater</b>	<i>Ardenna grisea</i>	NT		0.21%
<b>Albatross</b>	<i>Phoebastria irrorate,</i> <i>Thalassarche melanophris</i>	CR, LC	1,824	0
<b>Turtles</b>	<i>Lepidochelys olivacea,</i> <i>Chelonia mydas, Dermochelys coriacea, Caretta caretta</i>	VU, EN, CR, CR	12	0

Data between 2015-2019 from Progama Bitacoras (IMPARPE ran programme) corroborates levels of interactions reported by industry. 31,082 interactions were recorded (63% seabirds, 37% with marine mammals). Although incident rates are high, mortality is very low. Within the artisanal fishery the only marine mammal that the fishery interacted with were South American sea lions.

### Mitigation measures

IMARPE and CeDePesca ran workshops as part of the Salvares programme to educate fishers on how to avoid and safely release entangled ETP species.<sup>15</sup> They have also provided training in avoiding contact with benthos in inshore areas. Anecdotal information from the industry is that fishers will haul gear early if there is an obvious presence of ETP species in the area. National legislation also prohibits the targeting or landing of ETP species within Peru.

<sup>15</sup> [FishSource - Anchoveta - Peruvian Northern-Central](#)



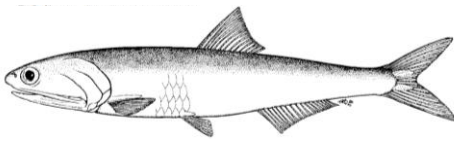


Image: Whitehead et al. 1988 via FAO

## Habitat



**Habitat impact was assessed as Very Low Risk. There is little to no risk of measurable impact by the fishery on benthic habitats.**

### Gear effects and targeting

The fishery targets a pelagic species which is mostly found in the top 50m of water depth. In some inshore areas bottom contact is reported but impact is limited.

### Evidence of habitat risk

There are no recorded VMEs with the fishery, but there is no complete assessment of habitats encountered by the fishery.

### Mitigation measures

Training has been provided on industry on best practices to avoid contact with benthic habitats.

## Glossary of terms

Term	Definition
<b>Fishing Mortality: F</b>	The rate of mortality due to fishing which is often expressed as an instantaneous rate; see Appendix. In some texts it is referred to as “Fishing pressure”
<b>Harvest Control Rule: HCR</b>	A Harvest Control Rule is a set of well-defined management actions that are taken in response to changes in stock status.
<b>Maximum Sustainable Yield: MSY</b>	Catching the maximum quantity that can safely be removed from the stock while maintaining its capacity to produce sustainable yields in the long term.
<b>Natural Mortality: M</b>	The rate mortality due to natural causes expressed as an instantaneous rate; see Appendix
<b>Safe Biological Limits: SBL</b>	When a stock is inside safe biological limits there is considered to be sufficient reproductive capacity to support a fishery.
<b>Target reference point: TRP</b>	Target reference points are levels of fishing mortality and/or Biomass of a stock which managers aim for in the long term.
<b>Target reference point (lower): LRP</b>	Lower limit of the target reference points are levels of fishing mortality and/or Biomass of a stock which managers aim for in the long term.

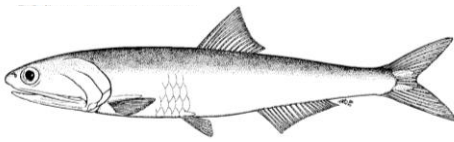


Image: Whitehead et al. 1988 via FAO

Term	Definition
<b>Total Allowable Catch: TAC</b>	The Total Allowable Catch (TAC) is a catch limit (expressed in tonnes or numbers) set for a fishery generally for a year or a fishing season.
<b>Trigger reference levels</b>	Trigger reference levels are levels of fishing mortality and/or Biomass of a stock which should trigger management action to bring the stock back towards the target
<b>Parent Fishery</b>	Defined at the broadest level, i.e Anchoveta purse seine.
<b>Nested Fishery</b>	A component fishery, utilising different capture or management methods but targeting the same stock.
<b>Child Fishery</b>	Component of the parent fishery operating at a smaller spatial scale.

### Further reading

Seafish has produced a series of further information including detailed guides to fisheries management and assessment. These can be accessed from [here](#).

**Industrial Purse Seine FIP** - [Peru anchovy - industrial purse-seine | Fishery Progress](#)

**Small Scale Purse Seine FIP** - [Peru anchovy - small scale purse-seine | Fishery Progress](#)

### Contact

**James Lamb**

### Fisheries Analyst

**Seafish**

[James.Lamb@seafish.co.uk](mailto:James.Lamb@seafish.co.uk)