

# Chile Squat Lobsters Camanchaca Demersal Trawl Fishery

MSC Certification Code: **MSC-F-31294**



Picture: Yellow squat lobster (*Cervimunida johni*). Credits: José Ríos

## 4<sup>th</sup> SURVEILLANCE REPORT (v2)

September 2021

Conformity Assessment Body: **Bureau Veritas Certification Holding SAS**



Conformity Assessment Body (CAB)	Bureau Veritas Certification Holding SAS
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Fishery client	Camanchaca Pesca Sur. S.A
Assessment Type	Fourth Surveillance

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## 2 Glossary

Below are presented the abbreviations and acronyms used in the report. The terms defined were checked to not contradict terms used in the MSC-MSCI vocabulary.

### Concepts and Terms:

<b>ACDR</b>	Announcement Comment Draft Report
<b>ARPA</b>	Artisanal Fishing Reserve Area
<b>BLIM</b>	Precautionary reference point. SSB below Blim indicate increase risk of impairment of recruitment
<b>B<sub>MSY</sub></b>	Spawning biomass (equilibrium) when fishing at F <sub>MSY</sub>
<b>CAB</b>	Conformity Assessment Body (in this case the CAB is Bureau Veritas)
<b>CAP</b>	Client Action Plan
<b>CPUE</b>	catch per unit effort
<b>CoC</b>	Chain of Custody
<b>DRI</b>	Image Registration Device (Dispositivo de Registro de Imágenes)
<b>ETP</b>	Endangered, Threatened and Protected
<b>EMS</b>	Electronic Monitoring System
<b>FCR</b>	(MSC) Fisheries Certification Requirements
<b>f/v</b>	Fishing vessel
<b>F</b>	Fishing mortality
<b>F<sub>LM</sub></b>	Fishing mortality which should be avoided with high probability because it is associated with unknown population dynamics or stock collapse
<b>F<sub>MSY</sub></b>	Fishing mortality at MSY
<b>CBA</b>	Acceptable biological Catch (Cuota Biologica Aceptable,). Equivalent to TAC
<b>HCRs</b>	Harvest Control Rule(s)
<b>LGPA</b>	Chilean General Fishing and Aquaculture Law (Ley General de Pesca y Acuicultura)
<b>LTP</b>	Transferrable Fishing Licence System
<b>MCS</b>	Monitoring, Control and Surveillance
<b>MSC</b>	Marine Stewardship Council
<b>MSY</b>	Maximum Sustainable Yield
<b>NGO</b>	Non-Governmental Organization
<b>PCR</b>	Public Certification Report
<b>PI</b>	(MSC) Performance Indicator
<b>PRI</b>	Point where Recruitment would be Impaired
<b>RAE</b>	Artisanal Fisheries System
<b>SA</b>	MSC surveillance audit
<b>SB</b>	Spawning biomass
<b>SB<sub>MSY</sub></b>	Spawning biomass at MSY
<b>SG</b>	(MSC) Scoring Guidepost
<b>TAC</b>	Total Allowable Catch. Equivalent to CBA in Chile.
<b>TTR</b>	Technical Terms of Reference
<b>UoA</b>	Unit of Assessment
<b>UoC</b>	Unit of Certification
<b>UPN</b>	Northern Fishery Unit
<b>UPS</b>	Southern Fishery Unit
<b>VMS</b>	Vessel Monitoring System
<b>ZCN</b>	Central Zone North
<b>ZCS</b>	Central Zone South

### Organizations:

<b>ACAB</b>	Agreement on the Conservation of Albatrosses and Petrels
<b>AIP</b>	Artisanal and Industrial Fisheries Association from the Coquimbo Region (Asociación de Industriales y Armadores Pesqueros de la Región de Coquimbo)
<b>ASIPES</b>	Industrial Fishers Association (Asociación de Industriales Pesqueros A.G.)
<b>ATF</b>	Albatross Task Force
<b>BV</b>	Bureau Veritas
<b>CCT</b>	Scientific Technical Committee (Comité Científico Técnico)
<b>CCTCD</b>	Scientific Technical Committee for Demersal Crustaceans (Comité Científico Técnico d. Recursos Demersales)
<b>CCT-RDZCS</b>	Scientific Technical Committee for Demersal Crustaceans South-Central Zone (Comité Científico Técnico de Recursos Demersales Zona Centro Sur)

<b>CEAZA</b>	Center for Advanced Studies in Arid Zones
<b>CM</b>	Management Committee (Comité de Manejo)
<b>CONAPACH</b>	National confederation of artisanal fishers (Confederación Nacional de Pescadores Artesanales de Chile)
<b>CONFEPACH</b>	National confederation of Artisanal Fishers' Federations (Confederación Nacional de Federaciones de Pescadores Artesanales de Chile)
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>IFOP</b>	Fisheries Development Institute (Instituto de Fomento Pesquero)
<b>GFW</b>	Global Fishing Watch
<b>INPESCA</b>	Instituto de Investigación pesquera Region VIII
<b>MINECON</b>	Ministry of Economy, Development, and Tourism (Ministerio de Economía, Fomento y Turismo)
<b>MSC</b>	Marine Stewardship Council
<b>PUCV</b>	Pontifical Catholic University of Valparaíso (Pontificia Universidad Católica de Valparaíso)
<b>SERNAPESCA</b>	National Fisheries Service (Servicio Nacional de Pesca)
<b>SUBPESCA</b>	Undersecretariat for Fisheries (Subsecretaría de Pesca)
<b>WWF</b>	World Wildlife Fund
<b>UCN</b>	Catholic University of the North (Universidad Católica del Norte)
<b>UDEC</b>	University of Concepcion (Universidad de Concepción)

### 3 Executive summary

This fishery was assessed against MSC Fisheries Certification Requirements version 2.0, and it is certified since the 9th of February 2017. However, as a result of the pandemic and subsequent [Covid-19 pandemic derogation issued by the MSC on March 2020](#), the certificate was extended for 6 months Until August 8, 2022), and the fourth surveillance audit was re-scheduled and an off-site audit to be held on June 2021. Current surveillance audit was conducted against FCP2.2 and MSC Full Assessment Reporting Template v2.1 was used to elaborate current report. This report accounts for the results of the fourth surveillance audit. This audit covers activities developed during the third year after the certification.

As summarised in **Table 5.1.1.**, one condition was closed as a result of the current surveillance audit (Condition 7 on PI 3.2.3), while the remaining 2 conditions (i.e., on PI 1.2.3 and PI 1.2.4) were found to be ahead of target and on target, respectively, since due to Covid-19 derogations the next milestones for these two conditions are postponed to the reassessment (during 2021/2022) (and deadline to August 2024 and 2023, respectively). Progress made by the client in order to fulfil the conditions and recommendations established in the initial assessment are described in Section 5 (Results). Re-scoring tables are presented in **section 5.4**. The announcement of the recertification is expected in September 2022.

¡Error! No se encuentra el origen de la referencia. presents overall scores given to each MSC Principle as published at the PCR and after each surveillance audit, while ¡Error! No se encuentra el origen de la referencia. presents scores for each Performance Indicator.

**Table 3.1.** Original and Revised scores after surveillance audits (SAs) for each MSC Principle and UoA (in red scores changed)

	Original Scores at PCR		Revised score at 1SA		Revised score at 2SA		Revised score at 3SA		Revised score at 4SA	
	UoA 1	UoA 2	UoA1	UoA2	UoA1	UoA2	UoA1	UoA2	UoA1	UoA2
<b>P1</b>	83,3	90.0	=	=	84.3	84.3	84.2	84.2	=	=
<b>P2</b>	82	82,3	=	=	=	=	84.3	84.3	=	=
<b>P3</b>	87,5	87,5	91,3	91,3	=	=	=	=	91,9	91,9

**Table 3.2.** PIs scores of the certified fishery as published at the PCR and after surveillance audits (in orange scores below 80, meaning a condition was raised for that PI)

Principle	Component	Performance Indicator (PI)		PCR		1SA		2SA		3SA		4SA	
				UoA1	UoA2	UoA1	UoA2	UoA1	UoA2	UoA1	UoA2	UoA1	UoA2
<b>One</b>	Outcome	1.1.1	Stock status	70	100	=	=	90	=	=	=	=	=
		1.1.2	Stock rebuilding	90	N/A	=	N/A	=	=	=	=	=	=
	Management	1.2.1	Harvest strategy	90	90	=	=	=	=	=	=	=	=
		1.2.2	Harvest control rules & tools	95	95	=	=	=	=	=	=	=	=
		1.2.3	Information & monitoring	65	65	=	=	=	=	75	75	=	=
		1.2.4	Assessment of stock status	90	90	=	=	65	65	=	=	=	=
<b>Two</b>	Primary species	2.1.1	Outcome	90	90	=	=	=	=	=	=	=	=
		2.1.2	Management strategy	85	85	=	=	=	=	=	=	=	=
		2.1.3	Information	85	85	=	=	=	=	=	=	=	=
		2.2.1	Outcome	90	90	=	=	=	=	=	=	=	=

	Secondary species	2.2.2	Management strategy	85	85	=	=	=	=	=	=	=	=
		2.2.3	Information	80	80	=	=	=	=	=	=	=	=
	ETP species	2.3.1	Outcome	85	85	=	=	=	=	=	=	=	=
		2.3.2	Management strategy	85	85	=	=	=	=	=	=	=	=
		2.3.3	Information	70	70	=	=	=	=	80	80	=	=
	Habitats	2.4.1	Outcome	70	70	=	=	=	=	85	85	=	=
		2.4.2	Management strategy	75	75	=	=	=	=	85	85	=	=
		2.4.3	Information	80	80	=	=	=	=	=	=	=	=
	Ecosystem	2.5.1	Outcome	80	80	=	=	=	=	=	=	=	=
		2.5.2	Management	80	80	=	=	=	=	=	=	=	=
		2.5.3	Information	90	90	=	=	=	=	=	=	=	=
Three	Governance and policy	3.1.1	Legal &/or customary framework	100	100	=	=	=	=	=	=	=	=
		3.1.2	Consultation, roles & responsibilities	85	85	=	=	=	=	=	=	=	=
		3.1.3	Long term objectives	100	100	=	=	=	=	=	=	=	=
	Fishery specific management system	3.2.1	Fishery specific objectives	70	70	100	=	=	=	=	=	=	=
		3.2.2	Decision making processes	85	85	=	=	=	=	=	=	=	=
		3.2.3	Compliance & enforcement	75	75	=	=	=	=	=	=	80	80
		3.2.4	Monitoring & management performance evaluation	90	90	=	=	=	=	=	=	=	=

Main findings from this surveillance audit are summarized below:

- The status of all both yellow and red squat lobsters was assessed to be fully-exploited in 2020, with  $SB > 80\% SB_{MSY}$ . Accordingly, all target stocks were considered to be above or fluctuating around MSY in 2020 with a high degree of certainty that they are above the point of recruitment impairment. Fishing mortality (F) has remained below the FMSY level for both target species.
- Common hake is an important fish bycatch species for all crustacean fisheries, at about 1-6% of total catches; this by-catch has declined since 2013. Hake by-catch is highest in the nylon shrimp fishery and lowest in the yellow squat lobster fishery. The common hake stock is in recovery and its status is gradually improving but was considered to be over-exploited in 2020 based on two of three assessment scenarios.
- The Plan for the reduction of discards, reiterated by Res. 4523 of 2018, establishes a landing obligation for all target species subject to quota, while discarding of other species is only allowed after being identified and recorded. Notification of all discards is mandatory. An electronic monitoring system (EMS) has been fully operational in the Industrial Fleet sector since January 1, 2020.
- In accordance with the provisions of Law 21,132, the certification of the landing by officials of SERNAPESCA began on January 1, 2020 (Resolution No. 5,913 of 2019 of SERNAPESCA).
- At the beginning of 2020 became in force the requirement of having an EMS implemented on board the industrial fishing fleet began, meaning a substantial advance in the reduction of discards on board. However, because of the problems derived from the Covid-19 pandemic, the analysis of the images recorded throughout 2020 is being completed only during the first semester of 2021. Once this analysis has been completed, SERNAPESCA will be able to issue infringement reports to all non-compliances detected, making fully effective the regulation established for discarding



and the protocols established for the proper practices on board to quantify discards, target species, bycatches and interactions with seabirds and marine mammals.

- Law 21,259 was passed, postponing the entry into force of the image recording cameras on board the artisanal fleet of a length equal to or greater than 15 meters to January 1, 2024. The Sernapesca representatives shared with the team that they are interested in starting a pilot project with the artisanal fleet as soon as possible, but they need candidates for voluntary trials. The UoA of this fishery includes a single artisanal vessel, but the team decided to set a new recommendation on this matter, so that all vessels included in the UoA have the ESM installed on board as soon as possible (see section 5.1.3 to check the new Recommendation).
- The percentage of observed trips increased in 2019. However, due to the Covid-19 pandemic, the coverage decreased significantly in 2020
- Although a high number of species are caught in these fisheries, only a few contribute 95% of the total catch weight. Those that concentrate the highest discard percentages are: aconcagua grenadier, common hake, big-eyed sole, jaiba paco and jaiba limon.
- Three years after the implementation of the Plan to Reduce Discard and Capture of Incidental Fishing in the demersal crustacean fishery, the low level of discards of target species is confirmed, with lower percentage values at 1% with respect to the total discarded fraction for all three fisheries.
- There is a decrease in the percentage of discards for all three fisheries compared to those evaluated during 2019.
- The implementation of the tori-lines as adopted in Res.Ex.Nº2941/2019 is subject to be modified for the fleet targeting demersal crustaceans, since the net is hauled by the side of the vessel (not by the stern). The issue is being reviewed by SUBPESCA together with representatives of the fishing sector.
- The occurrence of interactions with marine mammals remains low and restricted to the South America sea lion (*Otaria flavescens*).
- In relation to the incidental catch and mortality of seabirds in the demersal crustacean fleet, a single fatality was recorded in 2019. This result confirms the low interaction between these fisheries and seabird observed throughout the historical series. Due to this low interaction no estimates were performed in 2020
- The agreement signed in 2019 between SERNAPESCA and the Global Fishing Watch (GFW) to make its fishing fleet tracking data publicly available is still in force. This means that all movements from commercial fishing vessels flying the Chilean flag can be tracked in near real-time using at the GFW website.

The assessment team concludes that **the MSC Certificate for this fishery SHALL remain active.**

## 4 Report details

### 4.1 Surveillance information

1 Fishery name		
CHILE SQUAT LOBSTERS CAMANCHACA DEMERSAL FISHERY		
2 Unit of Assessment		
UoA1	<u>Target stock:</u>	Red squat lobster – <i>Pleuroncodes monodon</i>
	<u>Fishing Area:</u>	FAO Areas 87.2.14-87.2.15-87.2.16. Southern Zone, Regions V to VIII outside the area five miles parallel to the coastline and to the west boundary of the imaginary line at a distance of 60 nautical miles



	<p><u>Fishing method:</u> measured from the normal baselines. Managed by the Chilean fisheries authorities.</p> <p><u>Fishing operators:</u> Demersal trawl</p> <p><u>Other eligible fishers:</u> 3 demersal trawls vessels owned by Camanchaca Pesca Sur SA are part of the UoC. These vessels are only fishing against the quota allocated to Camanchaca Pesca Sur, S.A.</p> <p>8 vessels that might be hired by Camanchaca Pesca Sur, S.A. to fish the quota allocated to this Company. An updated list is yearly published in the MSC website.</p>		
UoA2	<p><u>Target stock:</u> Yellow squat lobster – <i>Cervimunida johni</i>. FAO Areas 87.2.14-87.2.15-87.2.16. Southern Zone, Regions V to VIII outside the area five miles parallel to the coastline and to the west boundary of the imaginary line at a distance of 60 nautical miles measured from the normal baselines. Managed by the Chilean fisheries authorities.</p> <p><u>Fishing Area:</u></p> <p><u>Fishing method:</u> Demersal trawl</p> <p><u>Fishing operators:</u> 3 demersal trawls vessels owned by Camanchaca Pesca Sur SA are part of the UoC. These vessels are only fishing against the quota allocated to Camanchaca Pesca Sur, S.A.</p> <p><u>Other eligible fishers:</u> 8 vessels that might be hired by Camanchaca Pesca Sur, S.A. to fish the quota allocated to this Company. An updated list is yearly published in the MSC website.</p>		
3 Certificate details			
Certificate code	BV-F-00550		
Date certified	09 Feb 2017	Date of expiry	08 August 2022
Due to the MSC Covid-19 Derogation 27 March 2020, the certificate of the fishery has been extended 6 months. Consequently, the updated date of expiry is now 9 <sup>th</sup> August 2022.			
4 Surveillance level and type			
Level	Initially, the surveillance level was reduced from default surveillance (level 6) to level 5. However, during the 2nd surveillance audit the team, together with the client, decided to move the surveillance level from 5 to 6 due to the fact that there were still 6 conditions opened. This is the fourth audit, and the fishery is entering re-assessment. Recertification process will start in September 2022, immediately after current surveillance audit.		
Type	Current surveillance audit was carried out as an off-site audit due to the Covid-19 pandemic.		
5 Surveillance number			
1st Surveillance			
2nd Surveillance			
3rd Surveillance			
4th Surveillance	x		
Other (expedited etc)			
6 Assessment team <sup>1</sup>			
Team leader	José Ríos		
Team member 1	Edith Saa		
Team member 2	Earl Dawe		
7 Audit/review time and location			
The off-site visit. Remote meetings held between June 8 and 18, 2021.			

<sup>1</sup> See the Surveillance announcement at the MSC website for more details on how the team meets the competency criteria and the areas that they are responsible.

## 8 Assessment and review activities

During the site visit, the team conducted assessment activities in accordance with FCP 7.28.15-18. In the case of the current fishery the team concentrated in: (i) checking for any relevant modification affecting the fishery; (ii) assess progress against conditions set to the fishery. See **Appendix 7.1** for details on the people interviewed and for details on the stakeholder engagement strategy, and **Appendix 7.2** for details on topics discussed during the site visit and other stakeholder inputs. Harmonization activities with overlapping fisheries are described in **Appendix 7.4**

## 9 Conformity Assessment Body (CAB)

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## 10 Client

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## 4.2 Background

### 4.2.1 Personnel involved in science, management or industry

The institutions and bodies involved in the management, research and enforcement of demersal crustacean fisheries have not changed since the certification of the fishery, although some of the authorities in charge may have changed. Thus, in October 2019, Mr. Lucas Palacios assumed the position of Minister of Economy, Development and Tourism. Ms. Alicia Gallardo Lagno assumed the position of Undersecretary of Fisheries in January 2021 and Mr. Claudio Báez Beltrán assumed the position of Director of the National Fisheries Service in June 2021.

The research for the management of the fishery remains in charge of the Instituto de Fomento Pesquero (IFOP) through the Performance Convention (Convenio de Desempeño) that is carried out annually with the Subsecretaría. The research according to the law that is not considered to be of continuity can be carried out by the Fisheries Research Fund (Fondo de Investigación Pesquera). Annually the Undersecretary of Fisheries (**SUBPESCA**), establishes by Resolution the research to be developed for the management of fisheries.

SUBPESCA Resolution No. 3.782 of 2019, established the research programme for regulating both fishing and aquaculture for 2020. Research involving demersal crustacean fisheries was undertaken in the following studies:

#### A monitoring and surveillance programme:

- Monitoring programme for the main national fisheries, year 2020. Demersal Crustacean fishery.

#### Direct stock assessment (swept area):

- Direct evaluation of yellow squat lobster, red squat lobster, and nylon shrimp across the Antofagasta and Bio Bio regions in 2020.

#### Stock status and indirect evaluations

- The status and fishing possibilities for the biologically sustainable exploitation of the main national fishing resources in 2021. Demersal Crustacean fishery.

The following research was approved during 2020: The Catholic University of Valparaíso with the study, "Direct assessment of the yellow squat lobster, red squat lobster, and nylon shrimp across the Antofagasta

and Bio Bio regions in 2020", authorised by SUBPESCA Resolution No. 414 of 2020, modificada por Resolución N° 1.884 de 2020

SUBPESCA Resolution No. 2.783 of 2020, establishes the research programme for regulating both fishing and aquaculture for 2021. Research involving demersal crustacean fisheries was undertaken in the following studies:

#### Monitoring and follow-up programme

- Monitoring programme for the main national fisheries, Year 2021. Demersal crustacean fishery.

#### Direct stock assessment (swept area).

- Direct assessment of yellow squat lobster and red squat lobster, between the regions of Antofagasta and BioBio, Year 2021.

#### Status and Indirect Stock Assessments

- Status and possibility of biologically sustainable exploitation of the main national fishery resources, Year 2022: Demersal crustaceans.

The research programme for 2021 includes the following study financed by the Fisheries Research Fund: Sources of variability in the catchability of demersal crustaceans in direct assessment cruises.

## 4.2.2 Certified fleet and client group

### 4.2.2.1 Client group

Camanchaca-Pesca Sur is the owner of the certificate. No changes in the client group since the certification of the fishery.

### 4.2.2.2 Certified fleet

As defined in the PCR the UoA is comprised by 3 vessels belonging to Camanchaca-Pesca Sur (which at that time constituted the UoC) and a list of eligible vessels which may be hired by the Company to fish part of its quota. The initial list included in the PCR comprised 8 vessels. Every year, before the start of the fishing season, Camanchaca-Pesca Sur communicates to the CAB which vessel shall be included in the UoC for that season and those vessels are added to the initial UoC. Then, the list is published at the MSC website. On the 26<sup>th</sup> of February 2020 a list detailing the UoC for the 2020 fishing season was published (see **Table 4.2.2.1**).

**Table 4.2.2.1.** UoC for the 2020 fishing season, as published at the MSC website

#	Name of the Vessel	Enrolment	Register (place)	Signal	Fishing Register	Owner	TRG (tons)	Length (m)
1	Nuestra Señora de la Tirana II	1784	Valparaíso	CB3293	RPI-1217	Camanchaca Pesca Sur, S.A	90,00	19,72
2	Altair I	1733	Valparaíso	CB3356	RPI-1206	Camanchaca Pesca Sur, S.A	94,49	22,50
3	Antares	1901	Valparaíso	CB2440	RPI-980	Camanchaca Pesca Sur, S.A	100,00	21,72
4	L/M Tome	606	San Vicente	CB-2711	RPA-960652	Jorge Cofre Toledo	49	17.8
5	Pesquero Crusoe I	2060	Valparaíso	CB2484	RPI-32003	Pesquera CMK Limitada	77,92	21,97
6	Pesquero Isla Orcas	1868	Valparaíso	CB3387	RPI-85	Pesquera Sunrise S.A.	84,08	21,95

The list of vessels to be included in the UoC for the 2021 fishing season has already been sent to the CAB and published at the MSC website on 16 of February 2021. The list of vessels for 2021 excludes the Isla Orcas (Matrícula 1868- Valparaíso) and includes in the UoC the Cocha (Matrícula 1826- Valaparaíso) and Maori (Matrícula 1854-Valparaíso).

#### 4.2.3 Regulatory framework and fishery management

Both the red squat lobster in Regions V-VIII (UoA 1) and the yellow squat lobster in Regions V-VIII (UoA 2) are managed under the rebuilding fisheries system, in accordance with Article 39 of the LGPA. This a system based on Individual Quotas which are purchased in public tenders (10% of the annual quota is tendered every year). The quota holders are granted an Extraordinary Fishing Permit (Permiso Extraordinario de Pesca).

None of the Fisheries has had major modifications in its management system since the initial assessment. However, several Laws, Articles and Decrees have been issued to update and improve some elements of the management system. The list below provides a summary of the most significant modifications:

##### 4.2.2.3 Auctions for tradable fishing licences (Licencias transables de pesca, LTP) for the Chilean hake

In accordance with temporary article 3º of law 20.657, towards the end of 2020, 15% of the industrial quota for Chilean hake was auctioned as a class B tradable fishing licence –LTPs- (5% in 2018, 5% in 2019, and another 5% in 2020), which are valid for 20 years. Many of the extraordinary fishing permits or tradable fishing licence holders for lobsters and nylon shrimp purchased these class B LTPs to cover the hake bycatches derived from their normal fishing operations.

In accordance with national fishing regulations, extraordinary fishing permit holders must register the vessels that they use for extractive activities beforehand, certifying with SERNAPESCA that they have a quota for associated species to which they can allocate the tonnes that they catch, in this case Chilean hake and nylon shrimp. (Resolution No. 3200 of 2013 and its subsequent amendments)

In accordance with the Chilean hake quota control data published in the National Fisheries Service website, the common hake quotas for 2018, 2019, 2020 and 2021 entitled to Camanchaca Pesca Sur are shown in **Table 4.2.3.1:**

**Table 4.2.3.1.** Demersal crustacean quota holders included in the client group that purchased common hake quota (LTP) to account for their hake bycatches

Fishing companies	Quota for 2018 (t)	Quota for 2019 (t)	Quota for 2020 (t)	Quota for 2021 (t)
Camanchaca Pesca Sur, S.A.	17,42	220,86	485,35	466,01
Jorge Cofre Reyes	1,03	1,25	2,01	2,21
Pesq. CMK, LTDA.	1,03	1,07	1,11	1,33
Soc. Pesq. Isla Damas S.A.	40,53	46,58	249,11	215,45
Gonzalez, Koper y Martínez Ltda.	-	-	-	-

##### 4.2.2.4 Catch quotas and allocation of rights

It is important to highlight that the Ministry for the Economy establishes the annual quota based on the proposal they are sent by the Scientific Technical Committee for Demersal Crustaceans (CCTCD). The CCTCD does not propose a quota, rather a range with lower and upper limits, aimed at maintaining the stock at MSY level.

All the relevant regulations establishing quotas for the red and yellow squat lobsters in Regions V-VIII for 2020 are listed below:

- Ministerio de Economía, Decreto N° 241 de 2019. This regulation established the red squat lobster quota in Regions V-VIII for 2020 in 5,518 tonnes. (Effective quota: 5,348 tonnes.)
- Ministerio de Economía, Decreto N° 240 de 2019. This regulation established the yellow squat lobster quota in Regions V-VIII for 2020 in 2,027 tonnes. (Effective quota 1,960 tonnes.)

All the relevant regulations establishing quotas for the target species of the UoA for 2021 are listed below:

- Ministerio de Economía, Decreto N°97 de 2020 This regulation established the red squat lobster quota in Regions V-VIII for 2021 in 6,346 tonnes. (Effective quota: 6,160 tonnes.)
- Ministerio de Economía, Decreto N° 94 de 2020. This regulation established the yellow squat lobster quota in Regions V-VIII for 2021 in 2,331 tonnes. (Effective quota: 2,260 tonnes.)

**Table 4.2.3.1** summarises the catch ranges advised by the CCTCD for 2021. SUBPESCA has established all the quotas for 2021 within the advised range, at the upper limit of the range or at values close to that limit.

**Table 4.2.3.1.** Range of the quotas for yellow squat lobster (langostino amarillo) and red squat lobster (red squat lobster) for 2021 advised by the CCTCD (Recomendacion CCTCD) Vs the quota set by SUBPESCA (Cuota establecida). The advised quotas were retrieved from the minutes of the CCTCD, while the set quotas are published at the Decrees detailed in the table. Table elaborated by the BV team

Cuota 2021				
Pesquerías	Propuesta de cuota Comité Científico Técnico	Fuente	Cuota 2021 establecida	Decreto
L. amarillo V - VIII Región	1.864 - 2.331	Acta CCT N° 5/2020	2.260	N° 94 de 2020
L. colorado V - VIII Región	5.076 - 6.346	Acta CCT N° 5/2020	6.160	N° 97 de 2020

#### 4.2.2.5 Discards and image recording cameras

The regulations, established by both SUPBESCA and SERNAPESCA, necessary for the entry into force of image recording cameras on board the industrial fishing fleet for the control of unauthorised discards as from 1 January 2020, were mostly established during 2019 (see previous surveillance audit report). Regulations established after that year are presented below:

- Undersecretariat of Fisheries, Resolution No. 324 of 2020, establishes the list of target species, bycatch and incidental fishing of the demersal crustacean fishery for 2020.
- Undersecretariat of Fisheries, Resolution N° 142 of 2021, establishes the list of target species, bycatch and incidental fishing of the demersal crustacean fishery for the year 2021.
- National Fisheries Service, Resolution No. 406 of 2020, establishes procedure for changing hard disks of image recording cameras.

National Fisheries Service, Resolution No. 878 of 2020, establishes exceptional procedure for the collection of hard disks from image recording cameras.

#### 4.2.2.6 Landing certification

Considering that as a consequence of the Covid-19 pandemic, the mobility of SERNAPESCA staff to visit landing sites for certification has been restricted in some regions, a procedure was established for the certification of landings remotely. For this purpose, the responsible professional must cross-check information and considers the information from the weighing system report, the information from the satellite positioning system, the electronic departure and the electronic logbooks.

National Fisheries Service, Resolution No. 857 of 2021, modifies Resolution No. 2.952 of 2019.

#### 4.2.2.7 Accreditation of legal origin

Amendments to Resolution No. 3.510 of 2018 are incorporated in order to modify the module AOL (accreditation of legal origin) considering improvements in the system and operational improvements in the module, in order to subsequently replace it.

- National Fisheries Service, Resolution No. 1.296 of 2020, amending Resolution No. 3.510 of 2018 and repealing Resolution No. 1.319 of 2014 as from 7 July 2020.

National Fisheries Service, Resolution N° 1.340 of 2020, establishes the procedure for the accreditation of the legal origin of hydrobiological resources and their derived products, establishes that Resolution N° 2.796 of 2009 applies in everything not modified, and leaves Resolution N° 3.510 of 2018 and its modifications without effect.

#### 4.2.4 Compliance

According to the information provided by SERNAPESCA, the non-compliances in the demersal crustacean fisheries detected that resulted in citations from the Courts of Justice were 3: one non-compliance in the shrimp fishery, issued to a transport for not accrediting the legal origin of the resource, and two non-compliances in the yellow squat lobster fishery, one to a transport for not accrediting the legal origin of the resource and the other to a vessel for a quota. Regarding non-compliance due to discards that correspond to administrative sanctions, this situation is analysed in section 4.2.4.2.

##### 4.2.3.1 Inspection actions

For the purpose of verifying the functioning of the regulations established for the demersal crustacean fishery, SERNAPESCA reported the development of 442 inspection actions to the industrial and artisanal sector in 2020 (response to request for transparency No. 460110221 dated 2 June 2021). The recorded inspection actions are presented in the following **Table 4.2.4.1**.

Con el objetivo de constatar que la normativa establecida para la pesquería de crustáceos demersales, SERNAPESCA informó del desarrollo de 442 acciones de fiscalización al sector industrial y artesanal en 2020 (respuesta a requerimiento solicitado por transparencia N° 460110221 de fecha 2 de junio de 2021), que se presentan en la siguiente **Tabla 4.2.4.1**.

**Table 4.2.4.1.** Inspection actions carried out by the National Fisheries Service in the demersal crustacean fishery, during 2020

Demersal Crustacean fishery, 2020			
Inspection actions	Artisanal	Industrial	Total
DRI Installation Certification	-	6	6
Control of landings in process	-	8	8
Discard Control	-	3	3
Inspection of fishing research	-	2	2
Sanitary Authorisation of Industrial plant	-	2	2
Inspection of Means of Transport	4	3	7
Inspection at Plant	-	9	9
Inspection at Landing Site	35	229	264
Inspection at Point of Embarkation	-	2	2
Inspection in Fishing Zone	3		3
Sealing of holds	4	33	37
Landing Certification Supervision	21	35	56
Supervision of VMS Devices	2	3	5
Verification of landing weight (no RAE)	-	29	29
Verification of species proportion	-	9	9
<b>TOTAL</b>	<b>69</b>	<b>373</b>	<b>442</b>

##### 4.2.3.2 Cameras on board

Since January 2020, the requirement for cameras to record images on board industrial vessels for the control of discards has been enforced. According to the information provided by SERNAPESCA during the audit



meeting, some vessels have had difficulties in fully complying with the protocols for handling catches on board, especially with regard to the separation of the different resources for quantification in front of the cameras and the immediate return to the water of the resources that should not be retained, such as blue crabs (jaibas), and in some situations unauthorised discarding of species can be observed.

One of the reasons given for this non-compliance in the demersal crustacean fleet was fundamentally associated with the age and behavioural characteristics of some crew members: many of them are older and consider that this new form of work on board means a greater workload that is paid, as well as the inertia of some crew members to continue doing the same things they did before this requirement. During the first months after the cameras came into force, SERNAPESCA held several meetings with the companies and their crews to inform them of the faults that were evident in the review of the images. It was also noted that this situation was not generalised, as both Pesquera Quintero and Camanchaca (which represent a relevant part of the fleet) have not presented the problems mentioned above.

It should be noted that at the time of preparing this report, SERNAPESCA had not yet finished reviewing all the 2020 images of this fishery, mainly due to the problems generated by the pandemic that has not allowed on-site work during some periods and the budgetary restrictions due to the pandemic, which have made it impossible to hire more staff to review the images.

In response to the consultation on the administrative penalties imposed on demersal crustacean fisheries for unauthorised discards in e-mail. Mr Naranjo said: *"to date, 8 findings of operations have been identified that have a high probability of corresponding to unauthorised discards, which are in different stages of technical legal analysis in order to soon generate the corresponding notification instructions. As the potential non-compliance is at the stage of being configured, it is not possible to provide more details of the offenders, but it is possible to indicate that the offenders are associated with fishing fleets that have a base port in Coquimbo"*.

In this regard, it should be noted that the sanctions for discarding, according to articles 40 C and 55 Ñ of the LGPA, are of an administrative nature and are therefore substantiated by SERNAPESCA, with the possibility of the sanctioned parties taking them to the courts of justice at the end of the procedure.

With regard to the artisanal fishing sector, article 3 of Law 21.259 postponed the entry into force of the image recording cameras for the artisanal fleet to 1 January 2024.

#### **4.2.5 Traceability issues**

As for the previous surveillance audit, SERNAPESCA and all the stakeholders interviewed during current site visit confirmed that the integral traceability system is in place for all the different stakeholders (fishers, processing plants, etc.) and working normally since 2019. All stakeholders are entering the electronic data through the same interface for all procedures, from the landing declaration to the mandatory documents for exporting (AOL).

As stated in section 4.2.3 a new Resolution modifies the requirements for the exporting documents. However, no significant modifications were identified compared to previous surveillance audit.

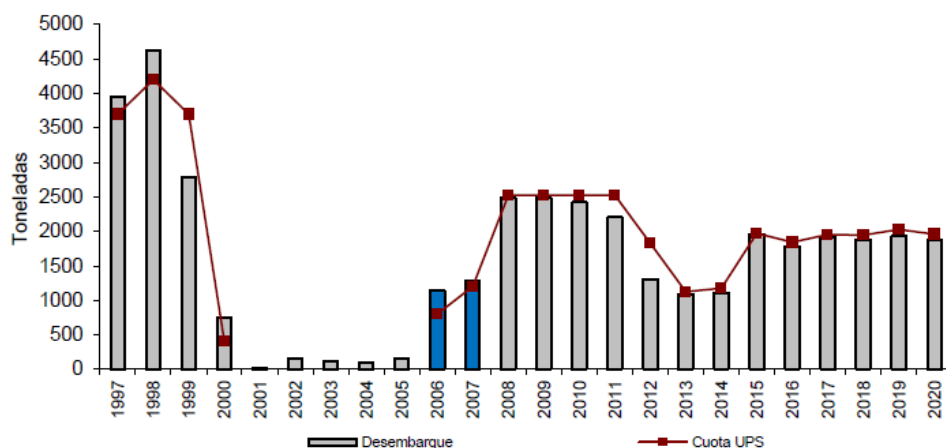
#### **4.2.6 Scientific based information related to P1**

##### **4.2.6.1 Stock status**

##### **Yellow squat lobster (Southern Area)**

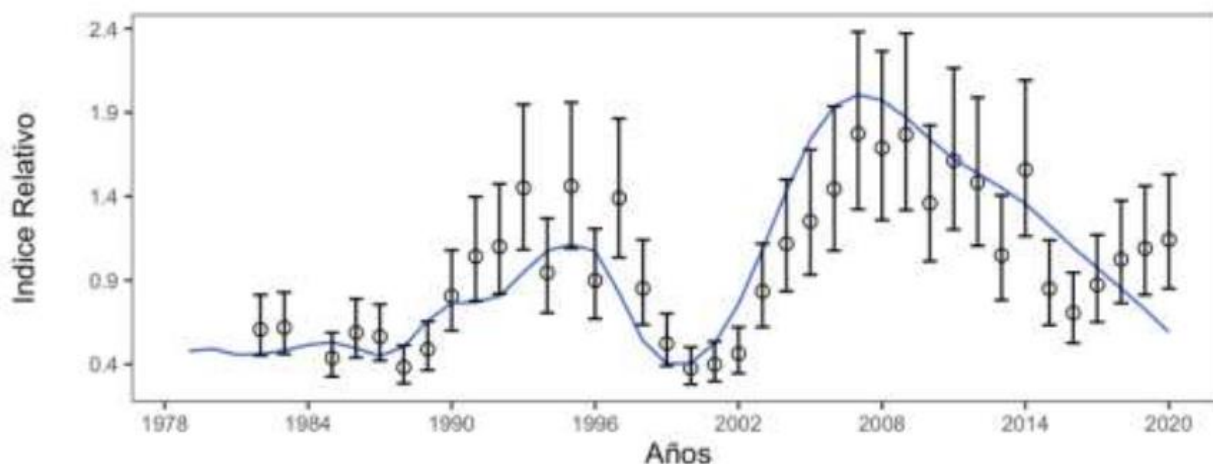
Landings declined from 2010-2013 and changed little in 2014 (**Figure 4.2.6.1**). They increased in 2015 and have since changed little. Landings totalled 1875 t in 2020 representing 95% of the total quota of 1,960 t (Zilleruelo et al 2020). The quota for 2021 was increased to 2,260 t (Decree No. 94), based on a proposed range of acceptable biological catch of 1,864 – 2,331 (see **Table 4.2.3.1**).





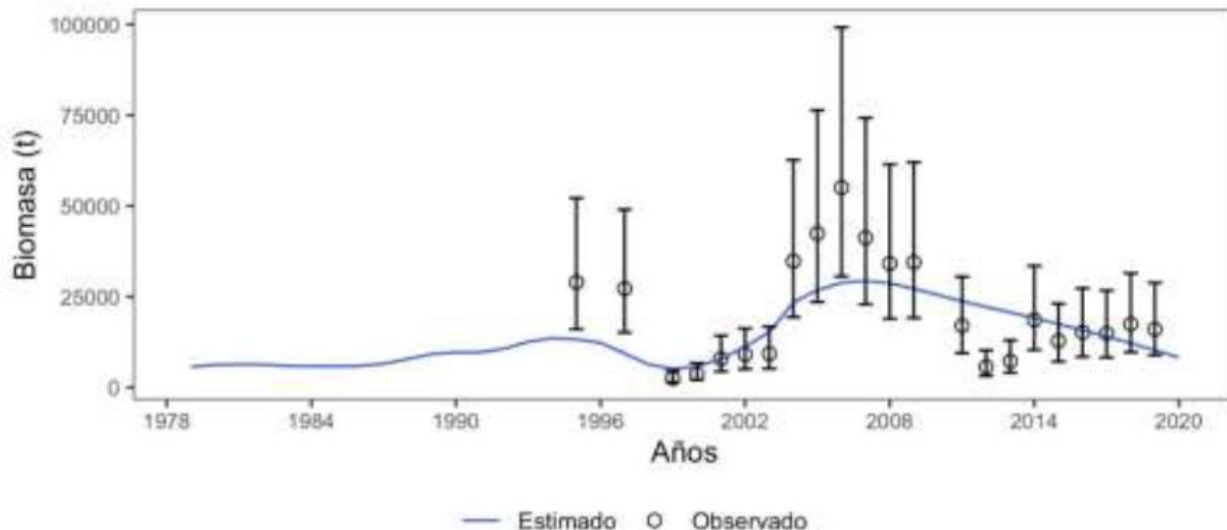
**Figure 4.2.6.1.** Annual landings (t) and catch quota (t) for the yellow squat lobster fishery in the southern region during 1997-2020: Source: Zilleruelo et al 2020 Fig. 42.

The model provided a poor fit to the observed standardized catch per unit effort (CPUE) series (**Figure 4.2.6.2**). It did not adjust well to the recent trend in observed estimates, suggesting a declining trend in abundance since 2007, while the data show an increasing trend over the past 5 years. The model underestimates the empirical estimates in the past 3 years.



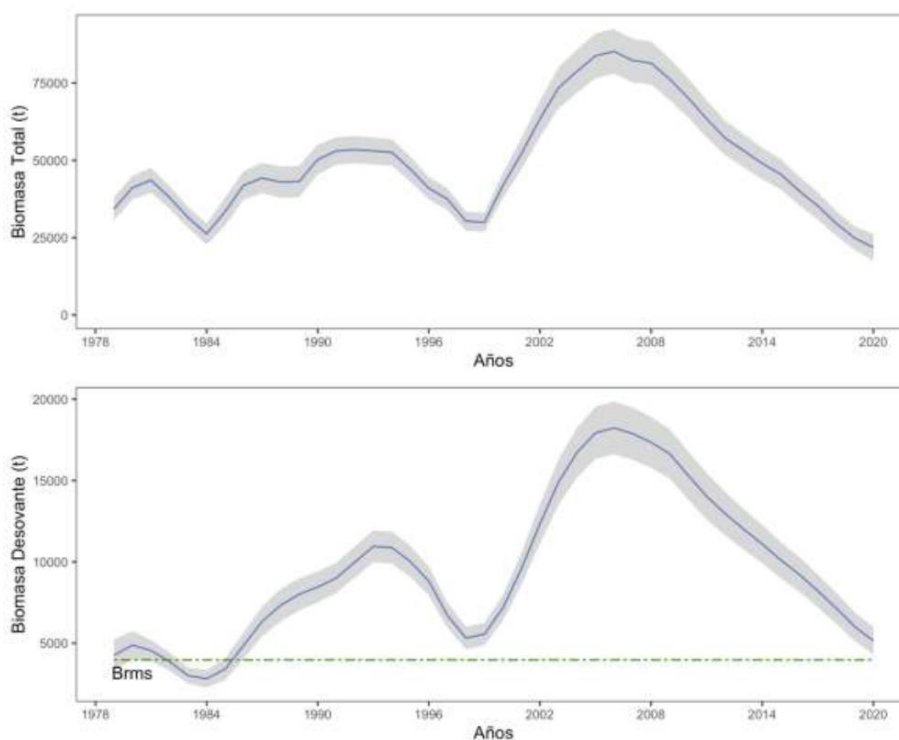
**Figure 4.2.6.2.** Fit of the model to the standardized CPUE data for yellow squat lobster in the southern region during 1985-2020. The points represent the observed data with its error and the blue line represents the model estimate. (partial): Source: Ibarra and Yáñez 2021, Fig.97.

The model also provided a poor fit to the observed survey biomass estimates, that are associated with high variability, especially during 2004-2009 (**Figure 4.2.6.3**). The model did not adjust to the recent trend in observed estimates, suggesting a declining trend in biomass since 2007, while the data show an increasing trend since 2012.



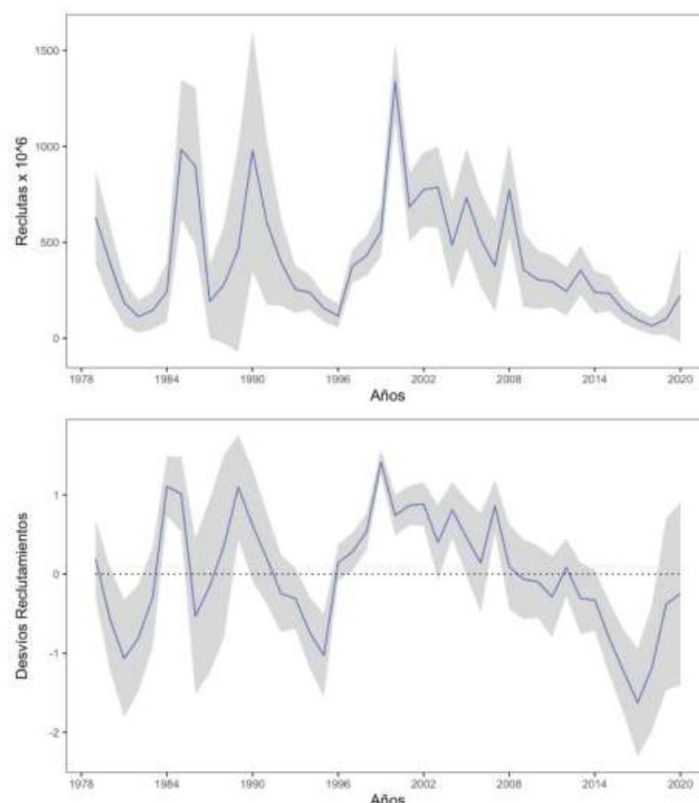
**Figure 4.2.6.3.** Fit of the model to the observed survey biomass estimates for yellow squat lobster in the southern region during 1979-2019. The points represent the observed data with its observation error and the blue line represents the model estimate. Source Ibarra and Yáñez 2021, Fig.97.

The total biomass and spawning biomass estimated by the model have both been in decline since 2006 (**Figure 4.2.6.4**). This continued decline in total biomass in recent years is not consistent with the recent increase in the empirical survey biomass values (**Figure 4.2.6.3**) and reflects high variability and uncertainty in the observed area-swept estimates as well as poor fit of the model. The modelled spawning biomass has declined by about 71% since 2006 (Ibarra and Yáñez 2021).



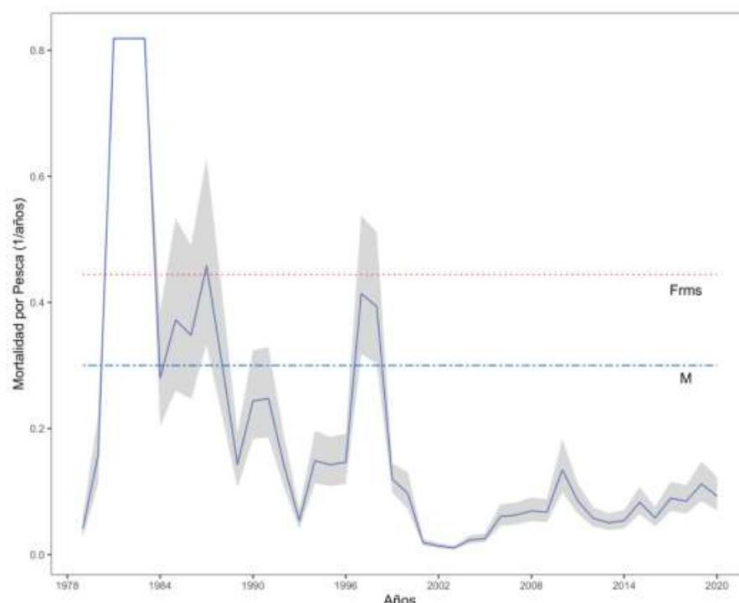
**Figure 4.2.6.4.** Total (a) and spawning (b) biomass of yellow squat lobster in the southern region during 1979-2020. The dotted line the value of the biological reference point Bmsy and the shaded area shows 95% confidence intervals. Source: Ibarra and Yáñez 2021, Fig. 105.

The assessment model results indicate that recruitment was highly variable and above the long-term average during the 2000's (**Figure 4.2.6.5**). It dropped by almost an order of magnitude from a peak in 2008 to its historical low in 2017 but appears to be recently recovering, approaching the long-term average.



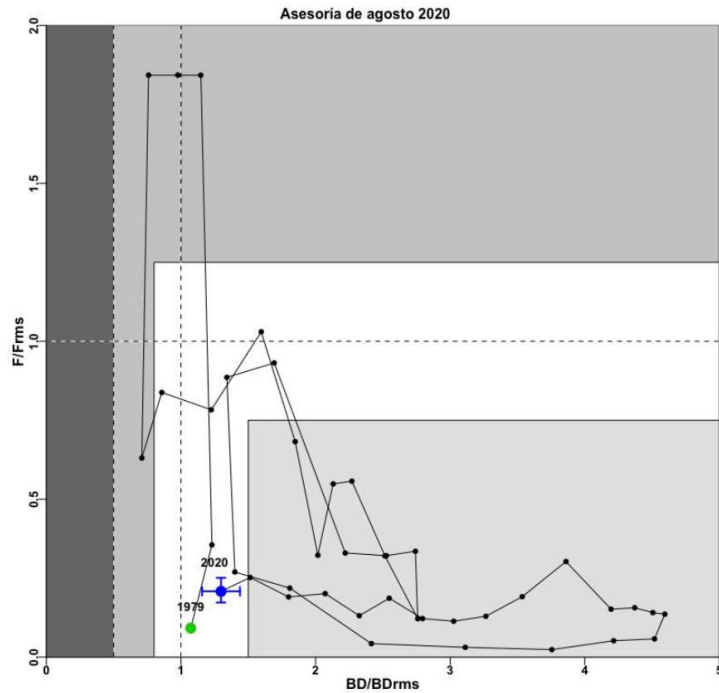
**Figure 4.2.6.5.** Recruitment (above) and logarithmic anomalies of southern yellow squat recruitment (below). The dotted line represents the historical average. Source Ibarra and Yáñez 2021 Fig. 106.

Fishing mortality increased from 2003-2006 and has since been variable, remaining well below the  $F_{MSY}$  level in 2020 (**Figure 4.2.6.6**).



**Figure 4.2.6.6.** Annual fishing mortality ( $F$  year-1) of southern yellow squat lobster. The green line represents the value of natural mortality and the dotted line the value of the biological reference point  $F_{msy}$ . Source Ibarra and Yáñez 2021 Fig. 107.

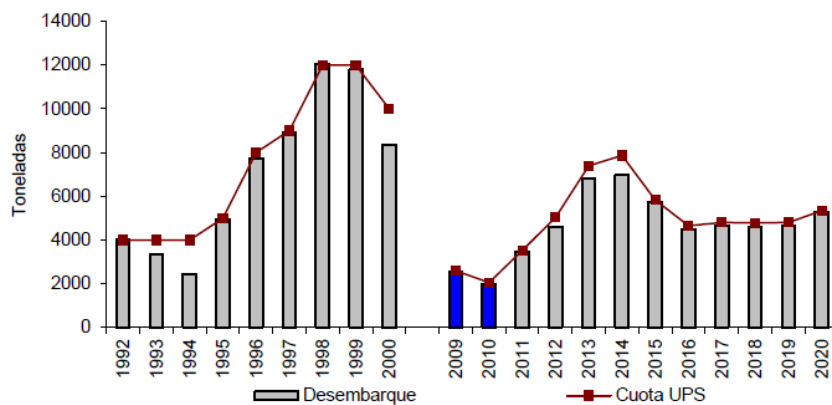
The status of the fishery in 2020 is evaluated based on changes in fishing mortality and spawning biomass relative to a phase diagram (**Figure 4.2.6.7**). A continued decrease in spawning biomass in 2020 resulted in the fishery moving from the under-exploited phase ( $SB/SB_{MSY} > 1.5$   $SB_{MSY}$ ) to the fully-exploited phase ( $0.8 \geq SB/SB_{MSY} \geq 1.5$ ).  $SB$  remained above  $SB_{MSY}$  and  $F$  remained well below the  $F_{MSY}$  level in 2020.



**Figure 4.2.6.7.** Phase diagram of southern yellow squat lobster with stock trajectory based on fishing mortality and spawning biomass (relative to MSY levels) overlain. Dashed lines at values of 1.0 represent MSY levels with  $F/F_{MSY}$  representing the overfishing threshold. Fishery status or phases are defined relative to MSY levels. Blue cross corresponds to the confidence intervals of the  $SB / SB_{MSY}$  and  $F / F_{MSY}$  ratio. Source Ibarra and Yáñez 2021, Fig. 110.

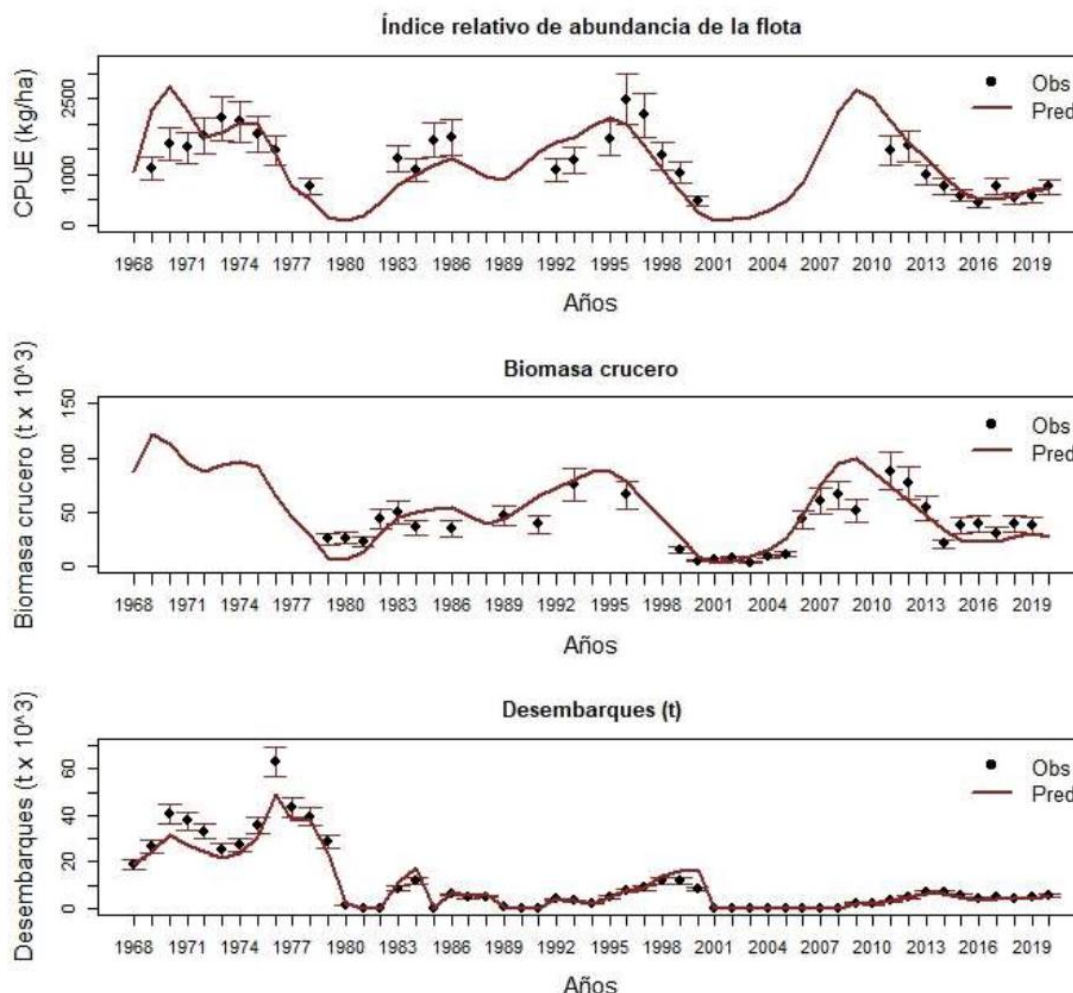
#### **Red squat lobster (Southern Area)**

Landings and quotas increased substantially from 2011-2014, declined to 2016 and changed little since. **(Figure 4.2.6.8)**. Landings increased marginally from 4,614 t in 2018 to 5,246 t in 2020 representing 98% of the total quota of 5,348 t (Zilleruelo et al 2020). The quota for 2021 was increased to 6,160 t (Decree No. 97), based on a proposed range of acceptable biological catch of 5,076 – 6,346 (See **Table 4.2.3.1**).



**Figure 4.2.6.8.** Annual landings (t) and catch quota (t) for the red squat lobster fishery in Regions V-VIII during 1993-2020: Source: Zilleruelo et al 2020, Fig 71.

The model provides a reasonable fit to the standardized CPUE data in recent years **(Figure 4.2.6.9)**. Generally, the model and the empirical data indicate that CPUE declined from 2012-2016 and has since changed little.

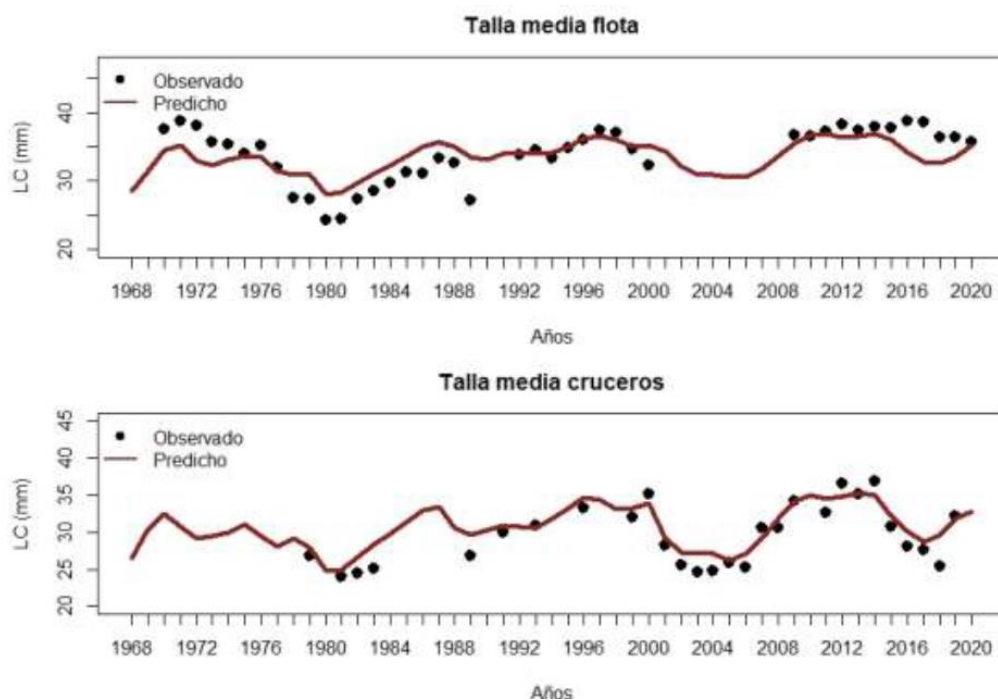


**Figure 4.2.6.9.** Fit of the model for red squat lobster in the southern region to the standardized CPUE estimates (top), observed survey biomass estimates (middle) and landings (bottom) The points represent the observed data with its observation error and the line represents the model estimate. Source Ibarra and Yáñez 2021, Fig.163.

The model provides a poor fit to the observed biomass (**Figure 4.2.6.9**) generally underestimating observed survey biomass estimates since 2010. However, the model and the empirical estimates agree that survey biomass declined from about 2011-2014 and has since changed little. This generally agrees with the recent trend in CPUE.

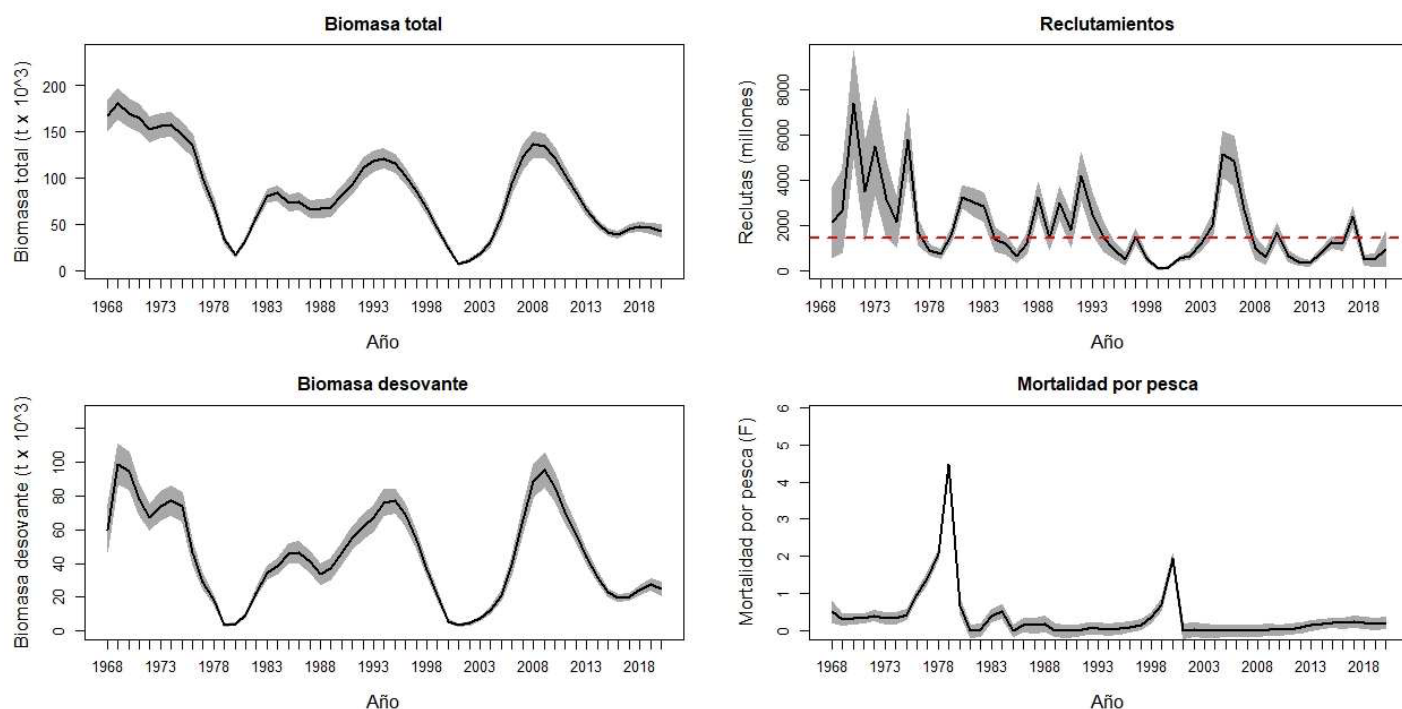
The model provides a poor fit to the mean size data from the fishery as well as from the survey (**Figure 4.2.6.10**), underestimating size from the fishery and overestimating size from the survey in most recent years. The empirical data indicate mean size decreased somewhat from 2016-2018 in the fishery, but lobsters remained large relative to the historical trend. Mean size in the survey showed a very similar trend to that in the northern area; mean size declined severely during 2014-2018, from the historical high to near the historical low (**Figure 4.2.6.10**), before increasing greatly in 2019. This great increase reflected progression of the single modal group in the 2019 survey (Ibarra 2020).





**Figure 4.2.6.10.** Mean sizes estimated by the model (red line) and those observed (points) in the fishery (above) and in the survey (below) for northern red squat lobster during 1998-2018: Source Ibarra and Yáñez 2021 Fig. 166.

The assessment model results (**Figure 4.2.6.11**) indicate that total biomass and spawning biomass declined during 2008-2016 and 2009-2016 respectively. Both have since increased, with total biomass increasing in 2017 and since changing little whereas spawning biomass continued to increase slightly to 2019 and change little in 2020 (Ibarra and Yáñez 2021).

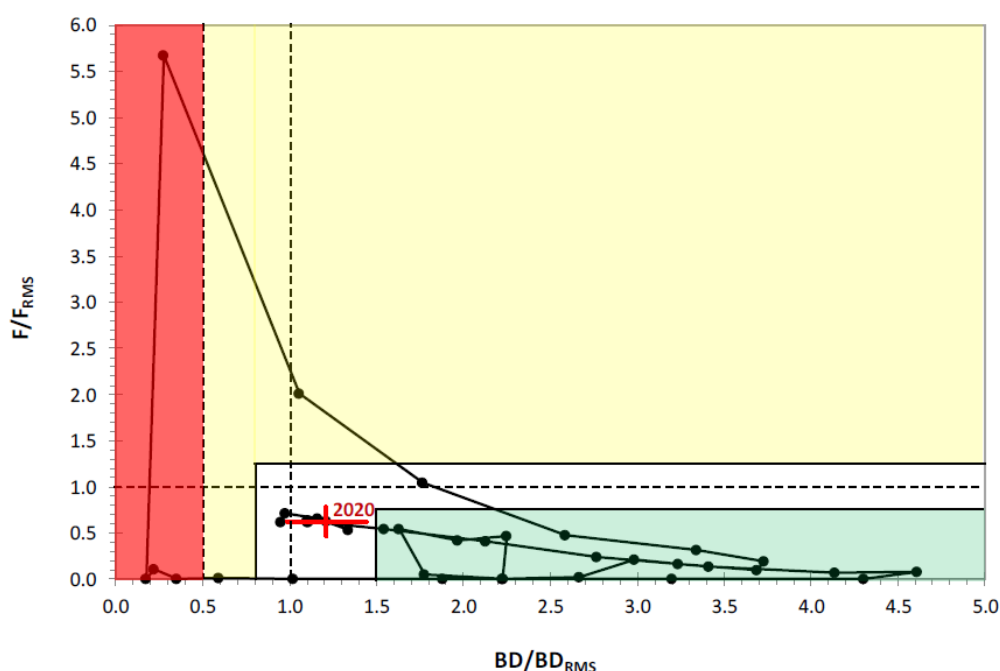


**Figure 4.2.6.11.** Results of the southern red squat lobster assessment model showing (clockwise from upper left) trends in total biomass, recruitment, fishing mortality and spawning biomass, 1968-2020. Shaded areas represent 95% confidence bands; Source Ibarra and Yáñez 2021 Fig. 168.

Recruitment has been variable throughout the time series (**Figure 4.2.6.11**). It declined by more than an order of magnitude from 2005-2013 before increasing to a peak in 2017. Recruitment increased from 2015-2017 (**Figure 4.2.6.11**), consistent with the decrease in size during those years (**Figure 4.2.6.10**), as also observed in the northern area. It then decreased sharply to remain below the historical average during the past three years.

Fishing mortality increased steadily from 2010-2017 (**Figure 4.2.6.11**) and has since changed little, remaining below the  $F_{MSY}$  level (Ibarra and Yáñez 2021).

The status of the fishery in 2020 is evaluated based on changes in fishing mortality and spawning biomass relative to a phase diagram (**Figure 4.2.6.12**). Fishery status has improved recently with SB increasing from 2016-2019 and remaining above the  $SB_{MSY}$  level in 2020 such that the resource remains in the fully exploited phase in 2020.  $F$  declined slightly from 2017-2019 and increased slightly to remain below the  $F_{MSY}$  level in 2020.



**Figure 4.2.6.12.** Phase diagram of southern red squat lobster with stock trajectory based on fishing mortality and spawning biomass (relative to MSY levels) overlain. Dashed lines at values of 1.0 represent MSY levels with  $F/F_{MSY}$  representing the overfishing threshold. Fishery status or phases are defined relative to MSY levels. Red cross corresponds to the confidence intervals of the  $SB / SB_{MSY}$  and  $F / F_{MSY}$  ratio. Source Ibarra 2020 Fig. 43.

The increase in SB in 2020, relative to that in 2019 from the previous assessment, is slight by comparison with the large increase in the northern area. This may be largely due to the substantial decline in fishery removals in the northern area, not realized in the southern area (**Figure 4.2.6.8**). There may also have been a real differences in strength of the recent recruitment pulse but this is highly uncertain.

#### 4.2.6.2 Uncertainties underlying the stock assessments

The main sources of uncertainty have been previously noted (Addison & Adlerstein-Gonzalez 2016, Saa et al 2019). Of particular concern is that the assessment model generally does not provide an adequate unbiased fit to the observed estimates of CPUE or survey biomass. The poor fit to the survey estimates is of particular concern with the model underestimating recent biomass estimates for red squat lobster and failing to adjust to the recent change in biomass trajectory for yellow squat lobster. These problems are likely (at least in part) related to high variability within the annual survey estimates, as indicated by broad confidence intervals, as well as year-to-year fluctuations in estimates that may reflect annual changes in survey catchability. Poor fit may also be related to the modelling approach, which places the least emphasis (weighting) on the survey series. There is additional uncertainty relating to poor fit of the model to the size frequency data.

### 4.2.7 Scientific based information related to P2



#### 4.2.7.1 Primary species

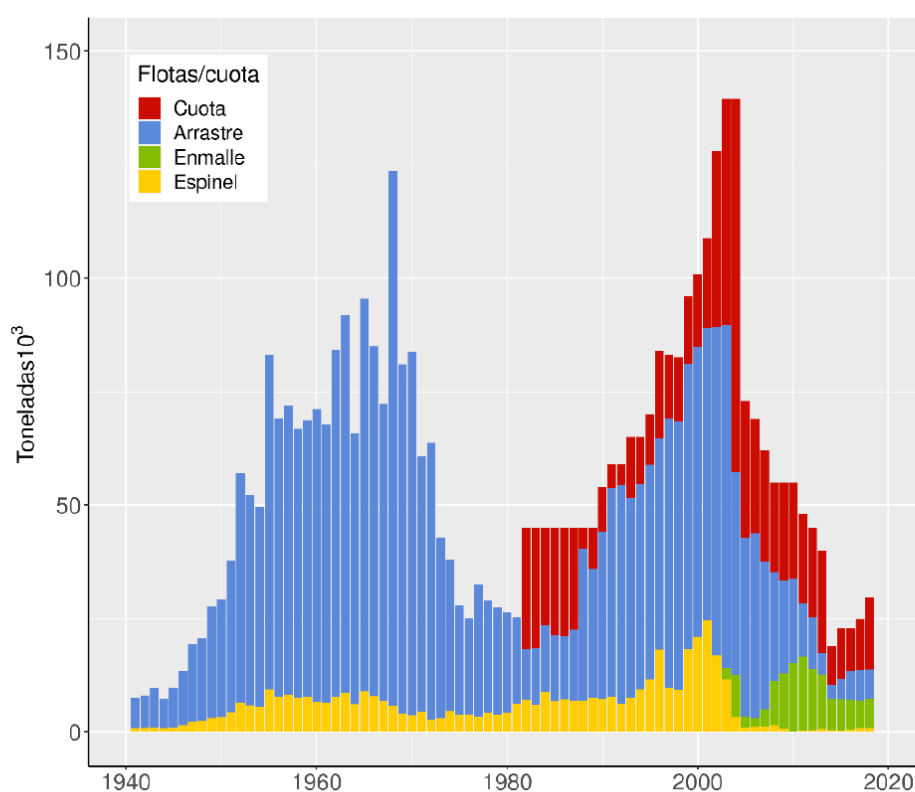
##### Common Hake (*Merluccius gayi gayi*)

The evaluation was carried out through three cases that corresponded to three alternative series of catches: official catches maintained by the National Fisheries Service (Case 0), the reconstruction of the catches proposed in 2019 by the Fisheries Management Committee (Case 1) and the series of captures issued by the FIP project 2015-45 (Case 2). Three other scenarios were also considered but they are not included here.

In all three cases, a positive trend of spawning biomass was observed in recent years. However it has been concluded, based on all three cases that the current state of the fishery is one of overexploitation

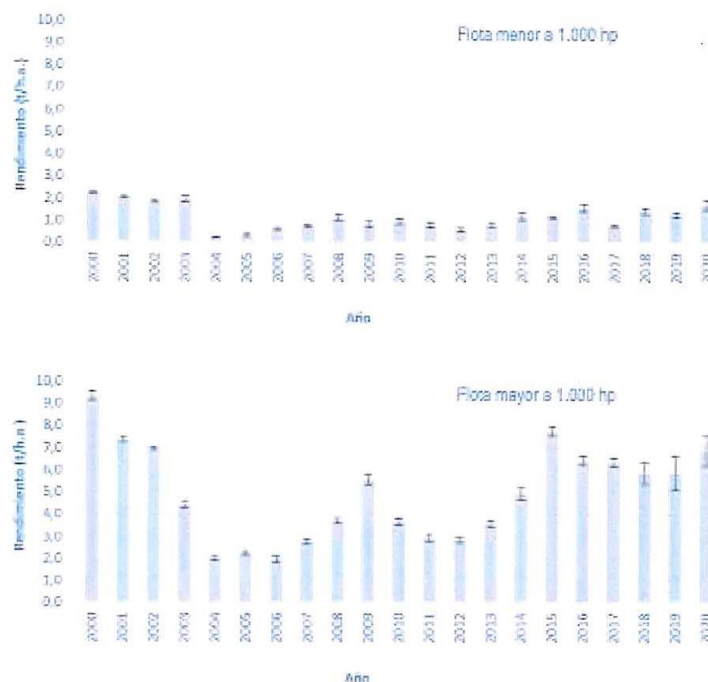
##### Stock Status

The common hake fishery has historically been prosecuted throughout Regions IV-VIII (Addison and Adlerstein-Gonzalez 2016). Most of the landings are derived from the industrial large-vessel offshore fishery using trawls (**Figure 4.2.7.1**), especially in Region VIII. An artisanal small-boat coastal fishery is conducted mostly throughout Regions IV-VII using longline and gillnets. Total landings declined from 121,000 t in 2001 to 47,400 t in 2005 and further declined to about 13,000 t in 2014 before increasing to 2017 and changing little since. Preliminary landings for 2018 totalled 22,136 t, with 13,836 t derived from the industrial fishery and 8,300 t derived from the artisanal fishery (Gálvez et al 2019). The industrial fishery landings represented 94% of the quota of 14,760 t for that fishing sector. Total landings have changed little in the past 3 years.



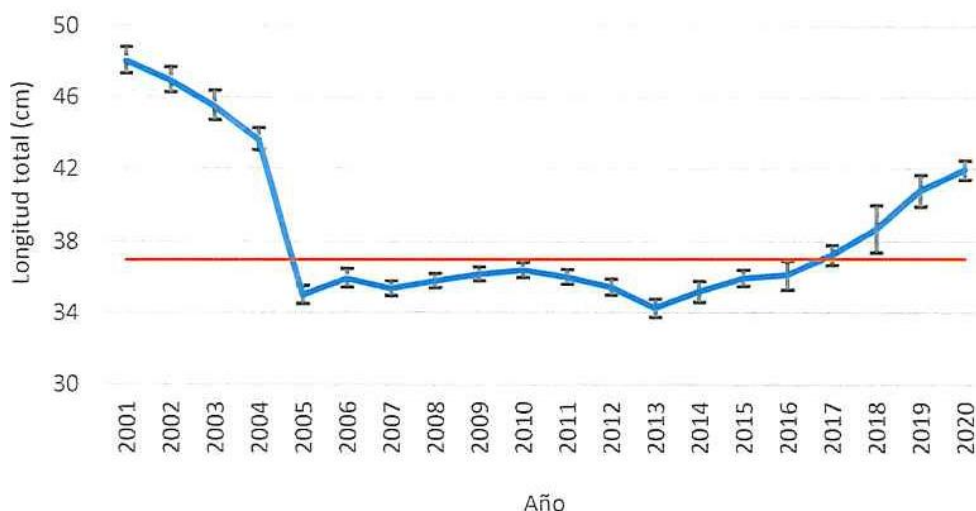
**Figure 4.2.7.1.** Landings by fishery and in total of common hake 1940-2019. Overall quota also shown for years when it was applied: Source: Tascheri 2021 Fig. 2.

Fishery performance deteriorated in the early 2000's, as best reflected by a decline in catch per unit effort (CPUE) of the large-vessel sector of the industrial trawler fleet (**Figure 4.2.7.2**). There has been no clear change in relative abundance since the mid 2000's based on fishery data. The increase in CPUE and decrease in fishing effort since 2013 in the large-vessel trawler fleet is not believed to be due to an increase in biomass but rather due to changes in fishing practices (Tascheri 2018). In the past 5 years the small vessel fleet showed high variability whereas the large vessel fleet showed a decline that was sharpest in 2018. Both fleets showed a slight increase in CPUE from 2018-2021 (CCT-RDZCS. 2020).



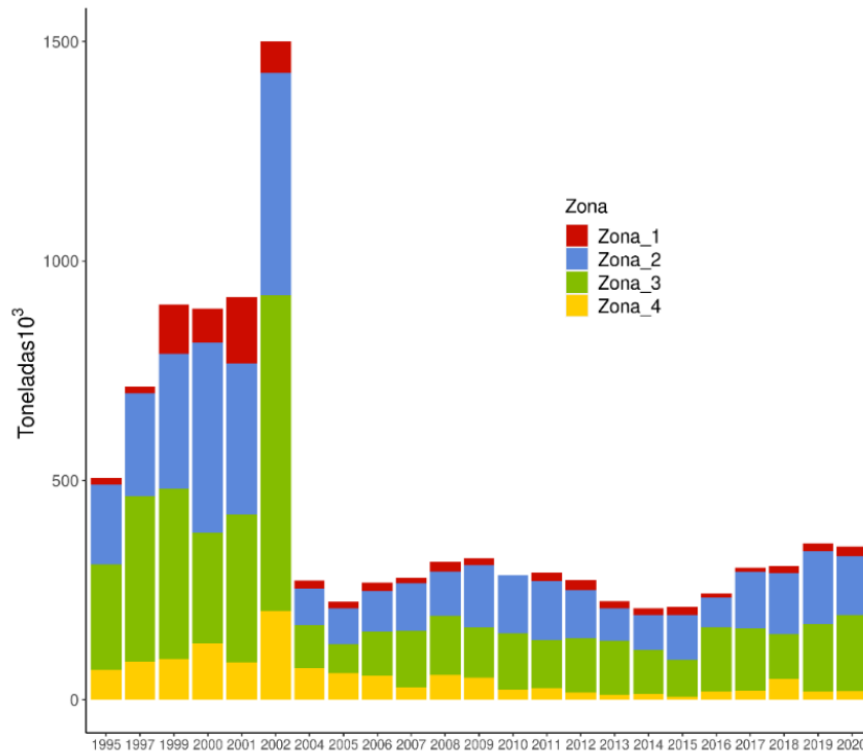
**Figure 4.2.7.2.** Catch per unit Effort (CPUE, t/ha) and associated effort (ha) from the small (above) and large (below) vessels of the industrial trawler fleet, 1997-2018: Source: CCT-RDZCS. 2020 Fig. 3.

Annual size structure of the fishery catch has been represented by unimodal size compositions in recent years (Tascheri 2019). Mean size decreased substantially from 2003-2005 and, while since remaining small, has been increasing steadily since 2013 to be above a 37 cm reference level during 2018-2020 (**Figure 4.2.7.3**).



**Figure 4.2.7.3.** Mean annual size, with 95% confidence intervals, of common hake from catches of the industrial trawler fishery in the south-central zone, for sexes combined, 2001-2020. Horizontal line is at 37 cm total length: Source: CCT-RDZCS. 2020, Fig. 5.

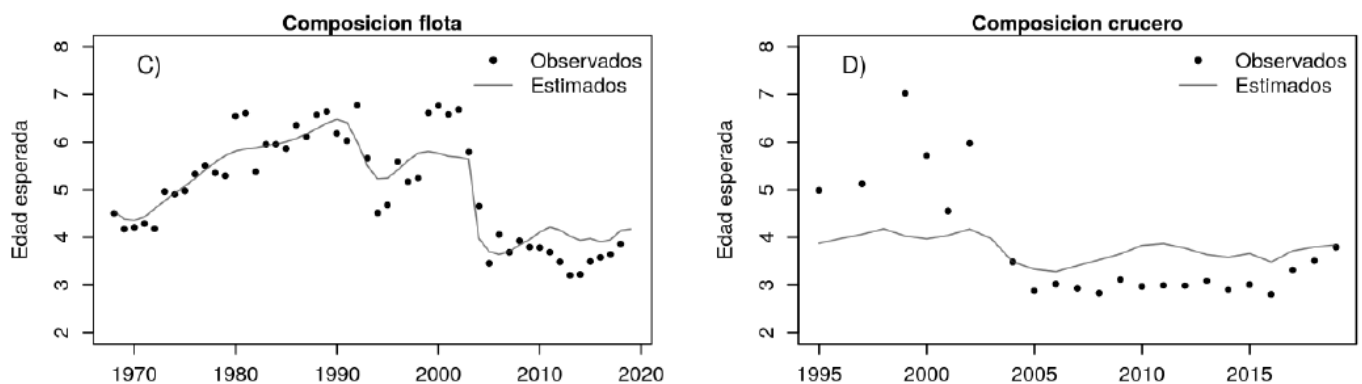
Biomass is estimated from an acoustic survey that incorporates biological sampling using a bottom trawl (Addison and Adlerstein-Gonzalez, 2016). Biomass dropped sharply from a level of about 800,000 t during 1999-2002, with the 2002 value considered anomalous (**Figure 4.2.7.4**) to a level of about 220,000-260,000 t from 2004-2016. Biomass has recently increased from about 240,000 t in 2016 to about 357,000 t in 2019 and changed little in 2020.



**Figure 4.2.7.4.** Series of biomass estimates from acoustic surveys by survey area, 1995-2020. Source: Tascheri 2021, Fig. 4.

The assessment process is based on an age-structured assessment model that includes survey and fishery data. The greatest source of uncertainty in the assessment is related to estimates of fishery removals. Accordingly, the assessment was conducted through three scenarios (cases) that differed with respect to the series of catch data included (Tascheri 2019): official catches maintained by the National Fisheries Service (Case 0), the reconstruction of the catches proposed in 2019 by the Fisheries Management Committee (Case 1) and the series of catches developed by the FIP project 2015-45 (Case 2). Case 0 represents the base scenario being based on the catch series used in historical assessments. All these cases used a common catch series for the years 1940 to 1979. Cases 1 and 2 used catches that included estimated discards since 2016. Further details on these scenarios are provided by Tascheri (2019, 2021).

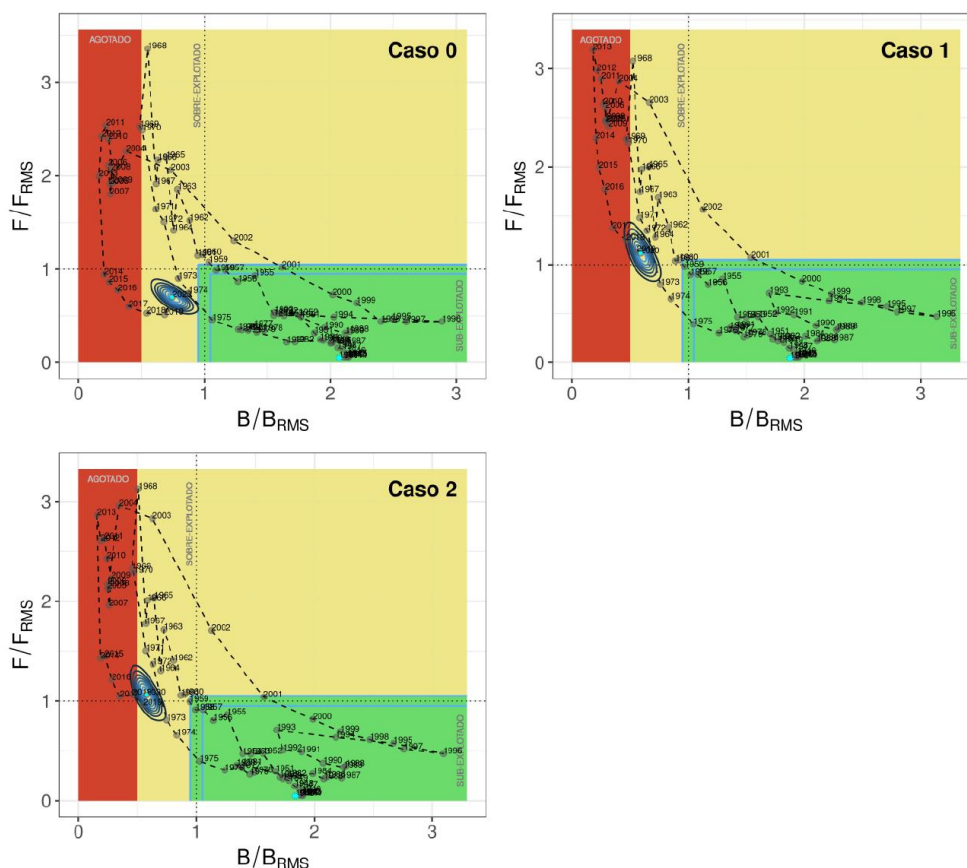
Age composition data from both the trawl fishery and the survey show that the mean age has declined greatly during the early 2000's (**Figure 4.2.7.5**). Mean age continued to decline gradually to 2015 in the trawl fishery, whereas it remained constant, at about 3 years of age, in the survey data. There has been a gradual increase in mean age in both series in recent years.



**Figure 4.2.7.5.** Observed mean age (points), with 95% confidence intervals, and predicted ages (continuous line) of two sets of age composition data included in the stock assessment model (Case 0); C) Trawl fishery; D) Survey. Source: Tascheri 2019, Fig. 4.

Spawning biomass dropped by a factor of 5 between 2000-2005 and has since remained low, although it has increased steadily in recent years, by at least a factor of 3 since 2013. This recent increase was associated with low fishing mortality;  $F$  declined from 2013-2019 and remained low in 2020 (Tascheri 2021). Recruitment decreased greatly between 1999 to its historical low in 2010. It has since increased gradually but remains low with a slight decrease in 2020 (Tascheri 2021).

Phase diagrams (**Figure 4.2.7.6**) show the stock trajectory based on fishing mortality and spawning biomass in relation to biological reference points and phases of exploitation, based on three scenarios that differ with respect to the series of fishery catch data used (Tascheri 2021). Generally, these trajectories suggest some recent slight improvement in stock status (**Figure 4.2.7.6**). However it has been concluded, based on all three cases that the current state of the fishery is one of overexploitation (CCT-RDZCS. 2020).



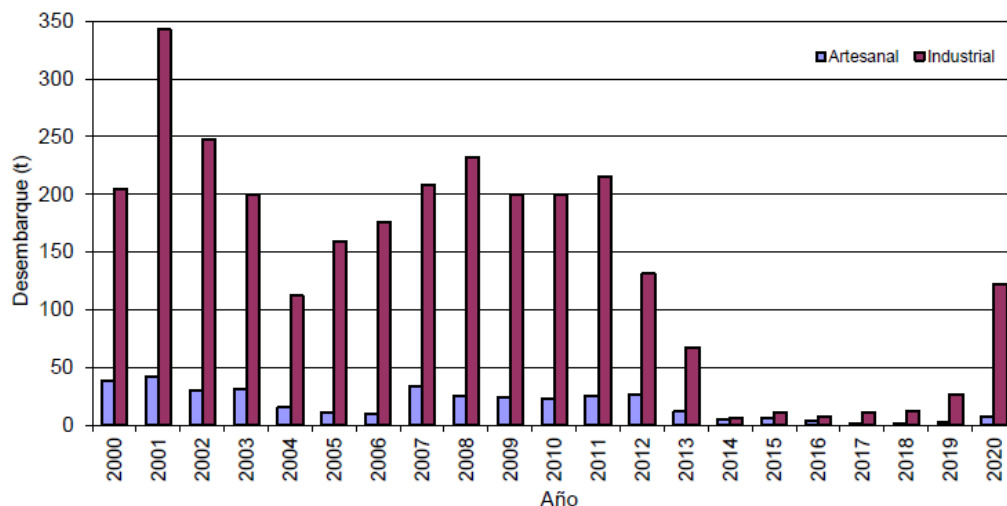
**Figure 4.2.7.6.** Phase diagrams showing the hake stock trajectory between 1940 and 2020 in relation to biological reference points based on the three stock assessment scenarios Source: Tascheri 2021 Fig.19.

### **Common Hake bycatch in demersal crustacean fisheries**

Common hake is considered a retained species because it has commercial value but until recently it has not been possible to distinguish retained from discarded hake bycatch in the demersal crustacean fisheries. Several studies have indicated that bycatch and discarding of hake has been underestimated in the official fishery data (Rios et al. 2017). The official landings statistics indicate a sharp decline in hake bycatch from 2011-2014, with bycatch since remaining very low to 2018 (**Figure 4.2.7.7**). This steady decline in the reported values is a result of regulations that limited the percentage of common hake that could be landed in relation to the landing of the target species and a subsequent requirement for shipowners to have hake catch quota in order to land it (Zilleruelo 2018). Since 2013 hake bycatches are allowed only against hake quota. However, between 2013 and 2015, during the implementation of the research programme on discards bycatches were allowed for the vessels participating in the programme (although they were thoughtfully recorded and reported by observers on board). However, until 2017 for most of the fishing companies targeting demersal crustaceans it was very difficult to have access to hake quota, since the existing hake quota was owned and consumed by the fishing companies targeting hake. This situation changed in 2018 when a new regulation established that 5% of the total hake quota shall be available to be purchased by fishing companies targeting demersal crustaceans, so they can cover their hake bycatches. During the first

tender held in December 2018 all AIP members purchased enough hake quota to account for all their bycatches. These allocations will last for 15 years. Stakeholders feel that hake quota allocation to demersal crustacean fishing companies helps to improve the reporting of hake bycatches.

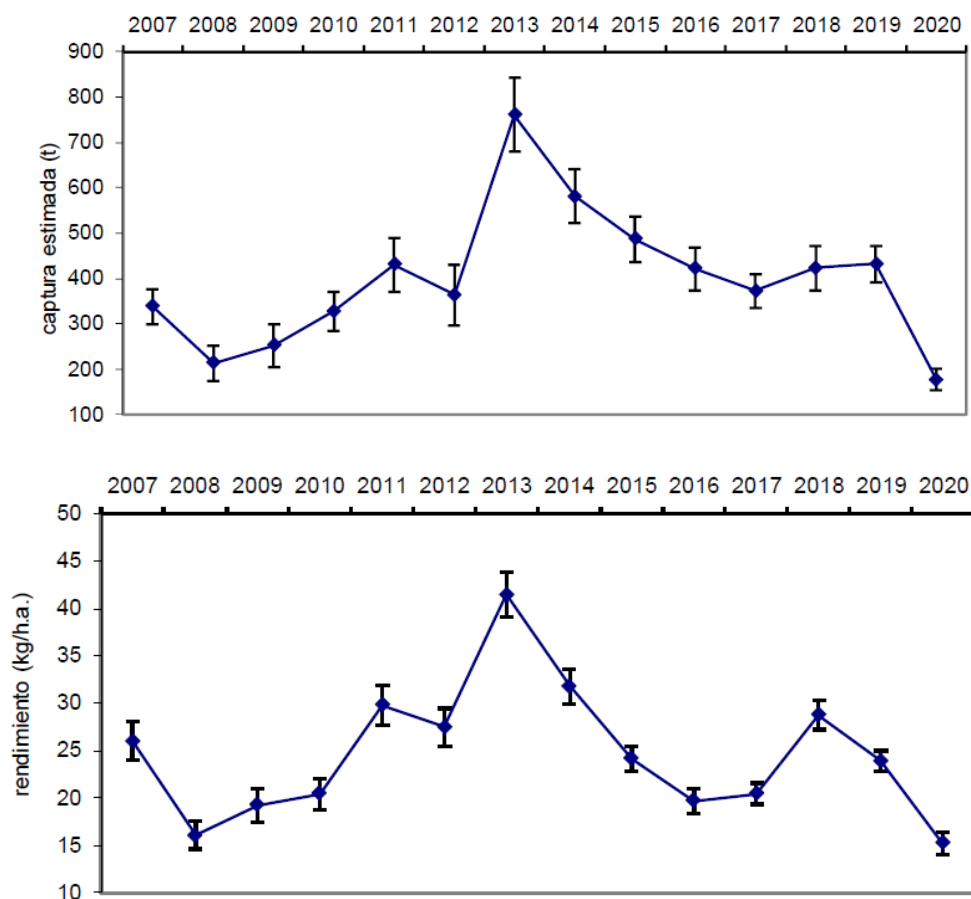
The reported hake bycatch has increased substantially in the past two years (**Figure 4.2.7.7**). This bycatch increased by about 400% across both fleets in 2020 with 122 t and 7 t landed by the industrial and artisanal fleets respectively (Zilleruelo et al 2020). The reason for this large increase in 2020 is presently unknown but will be further considered in the ACDR of the upcoming recertification process.



**Figure 4.2.7.7.** Annual series of landing of common hake (t) as bycatch in the demersal crustacean fishery, by fleet during 2000-2020 based on official data from Control-quota SERNAPESCA Source: Zilleruelo et al 2020 Fig. 108.

A recent comparison of 2018 hake bycatch reported in the official data from the demersal crustacean industrial fishery (12 t) with that estimated from at-sea sampling (431 t) indicated that hake bycatch (mostly from the nylon shrimp fishery) was greatly underestimated in the official statistics (Zilleruelo 2019). The estimated hake bycatch based on observer data (**Figure 4.2.7.8**) has exceeded that from the official statistics (**Figure 4.2.7.7**) by at least an order of magnitude since 2013. Estimated hake bycatch has declined from about 750-357 t during 2013-2017 (**Figure 4.2.7.8**) representing a decline from 6%-2%, as percentage of total catch from the directed hake fishery (**Figure 4.2.7.1**). This bycatch increased slightly, but not significantly to 2019 before decreasing by about half in 2020 (**Figure 4.2.7.8**). The estimated catch in 2020 based on observer data (288 t, **Figure 4.2.7.8**) was more than double that from the official statistics (127 t, **Figure 4.2.7.7**) (Zilleruelo et al. 2019).

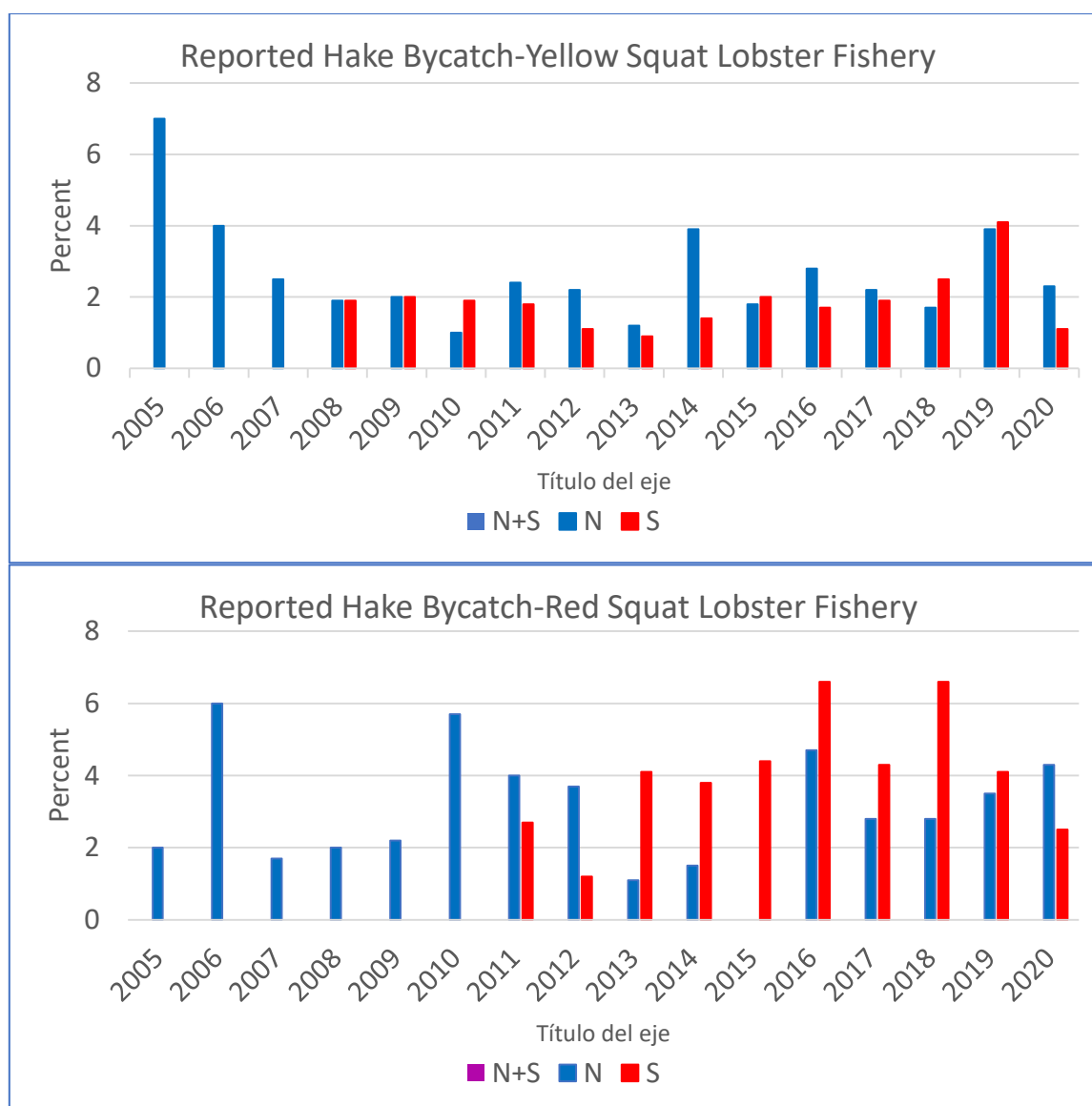
The observer-based CPUE fishery performance index declined greatly from 2013-2016 despite concurrent decline in observer-estimated landings (**Figure 4.2.7.8**). This CPUE abundance index increased substantially in 2018 despite a slight increase in landings. CPUE then declined to its lowest level in 2020 despite a great decrease in observer-estimated landings. This great decrease in CPUE contrasts the great increase in reported bycatch from the official statistics during 2018-2020 (**Figure 4.2.7.7**). However, the drop in both indices (Catch and CPUE) in 2020 from the observer data (**Figure 4.2.7.8**) are not evident in the catch data from official statistics.



**Figure 4.2.7.8.** Estimated total catch of common hake (above) and CPUE (below), caught as bycatch in the demersal crustacean fisheries; Industrial fleet IV-VIII Region, period 2007-2018. Source: Zilleruelo 2020 Fig 105 and 106.

Some indication of the relative contribution of common hake to the catches from the directed squat lobster fisheries may be inferred from the official catch statistics (**Figure 4.2.7.9**), although this is highly uncertain, given the low level of reporting. The reported catch of common hake from the red squat lobster fishery has been about twice as high as that from the yellow squat lobster fishery, especially in the southern area.





**Figure 4.2.7.9.** Reported percent by weight of common hake from the squat lobster fisheries, 2005-2017, from official IFOP statistics. **N+S:** Data from both areas combined (IFOP); **N:** Data from Northern area (IFOP); **S:** Data from Southern area; Source: San Martin et al 2016, Zilleruelo et al 2017, Zilleruelo et al 2018, Zilleruelo et al 2019, Zilleruelo et al 2020.

#### 4.2.7.2 Species composition of the total catch, including bycatches/non-target species (fauna acompañante)

Every year a report is prepared by IFOP on the monitoring of the demersal crustacean fisheries. The focus of this report is on providing biological indicators for the target species (squat lobsters and nylon shrimp), together with fishery indicators (yield and fishing effort). However, the final version of these reports also includes indicators of the impact of these fisheries on accompanying fauna (bycatches) and the incidental capture of birds, mammals and turtles. Two final reports on the monitoring of the demersal crustacean fishery have been published since the previous surveillance audit: Zilleruelo et al (2020) accounting for bycatches occurred in 2019, and Zilleruelo et al (2021) accounting for bycatches occurred in 2020.

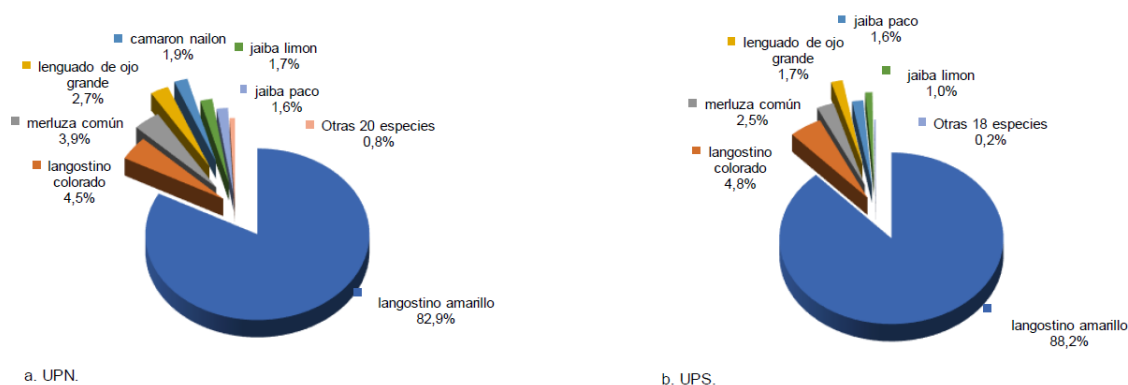
A brief summary on the results presented in these two reports is presented below. Data is consistent with previous years in terms of the percentage accounted by the target species. However, there is quite a lot of interannual variability in the species composition of the bycatches, as in previous years. The information presented in these annual monitoring reports is essential to get a clear picture of the species composition of each of the certified fisheries (red squat lobster, yellow squat lobster and nylon shrimp). So far, the information collected is consistent with the P2-species composition identified during the initial assessment and it does not merit that all P2 species are re-assigned to the MSC P2-species components (primary/secondary) and



subcomponents (main/minor). However, this exercise will be done for the forthcoming re-certification process, and the historical data series accumulated at that time will be essential to perform this classification.

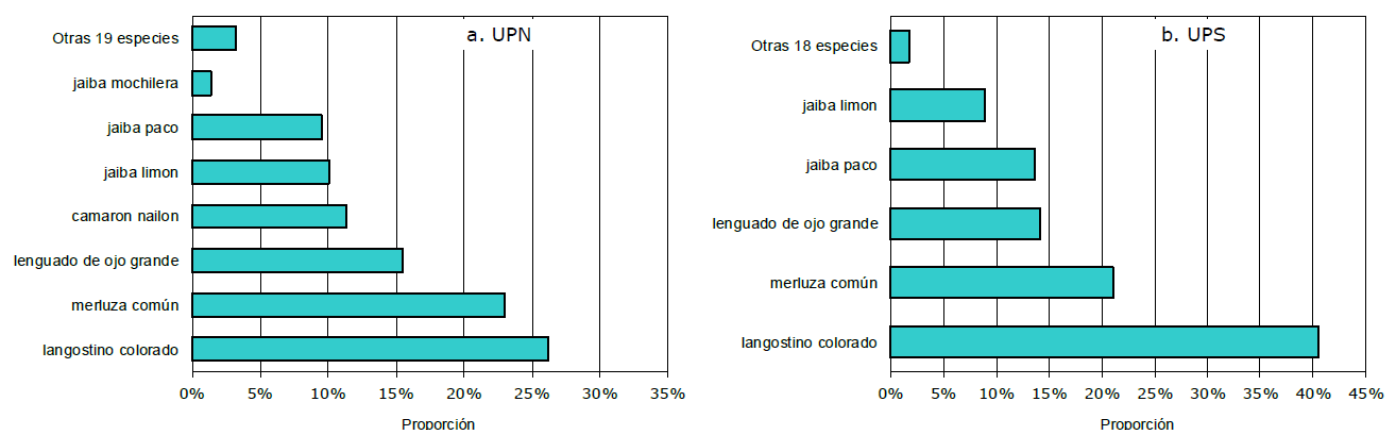
### Yellow squat lobster fishery

At the Northern Fishery Unit (UPN), 67 specific samples of bycatch were carried out, where the capture of 26 species was recorded. The target species represented 83% of the total captured, the species that followed in importance were: the red prawn (*P. monodon*) with 4,5% and the common hake with 3,9% (**Figure 4.2.7.10**). In the Southern Fishery Unit (UPS), also 67 samplings were carried out and 23 different species were recorded. The target species accounted for up to 88,2% of the total weight, followed by the red squat lobster which accounted for 4,8%, common hake with 2,5%.



**Figure 4.2.7.10.** Proportion of species by weight in the total catch, in sets targeting yellow squat lobster UPN (left panel) and UPS (right panel), year 2019. \* The category "other species" is composed of species that individually do not reach 1% of the total catch. Source: Zilleruelo et al 2020

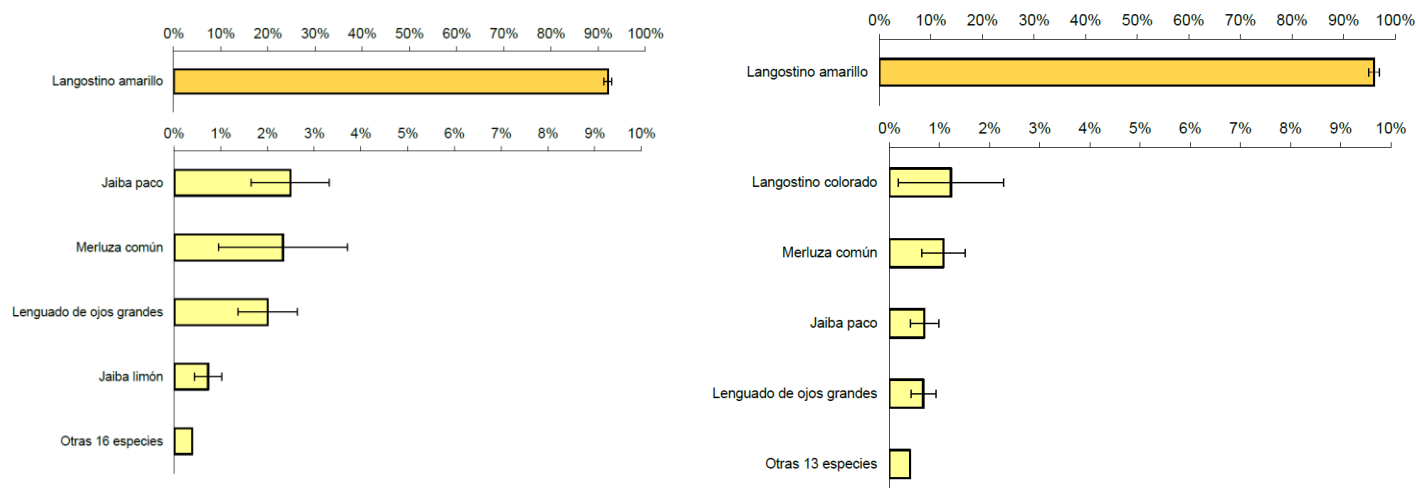
In the sets targeting yellow squat lobster at UPN, the species accounting for more of the non-target catches were red squat lobster (26%) and common hake (23%). On the other hand, at UPS, the red squat lobster accounted for 40% of the bycatches, followed by common hake (21%) (**Figure 4.2.7.11**).



**Figure 4.2.7.11.** Species composition of the bycatches (in weight), in sets targeting yellow squat lobster UPN (left panel) and UPS (right panel) in 2019. Langostino Amarillo \* The category "other 6 species" is composed of the 6 species that individually do not reach 1% of the total catch. Source: Zilleruelo et al 2020.

In 2020, the number of specific samplings for bycatches decreased to 83 due to the difficulties derived from the pandemic. Of these, 32 were carried out in the UPN with the presence of 21 species; and 51 in the UPS with a record of 18 species (Zilleruelo et al 2021). The target species (yellow squat lobster) in the UPN reached 92% of the total caught and 96% in the UPS (**Figure 4.2.7.12**).

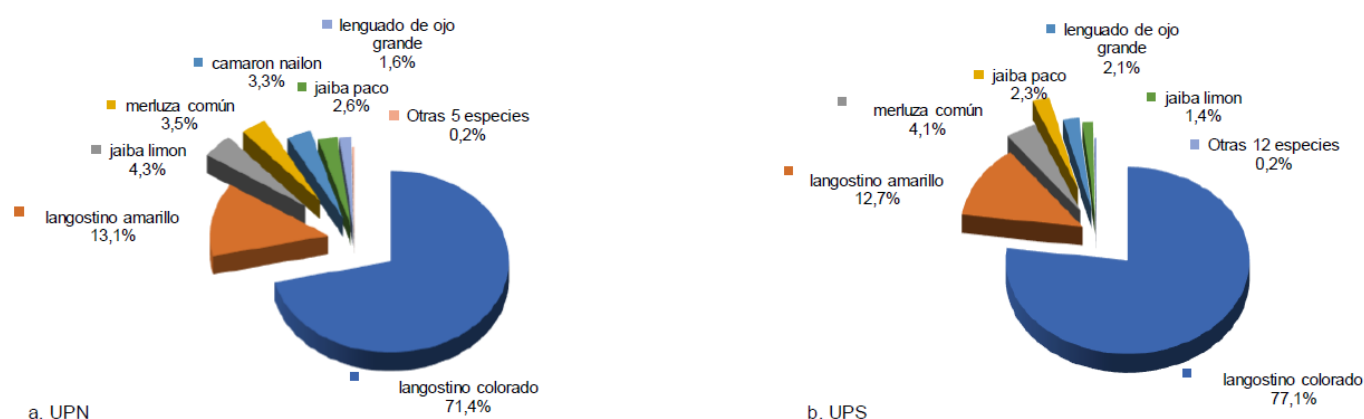
None of the bycatch species accounted for more than 2,5% of the total catches of the fishery in the UPN and not even 1,5% in the UPS (**Figure 4.2.7.12**).



**Figure 4.2.7.12** Proportion of species by weight in the total catch, in sets targeting yellow squat lobster in the ZCN (left panel) and the ZCS (right panel), year 2020. \* The category "other species" is composed of species that individually do not reach 0,3% of the total catch. Source: Zilleruelo et al 2021.

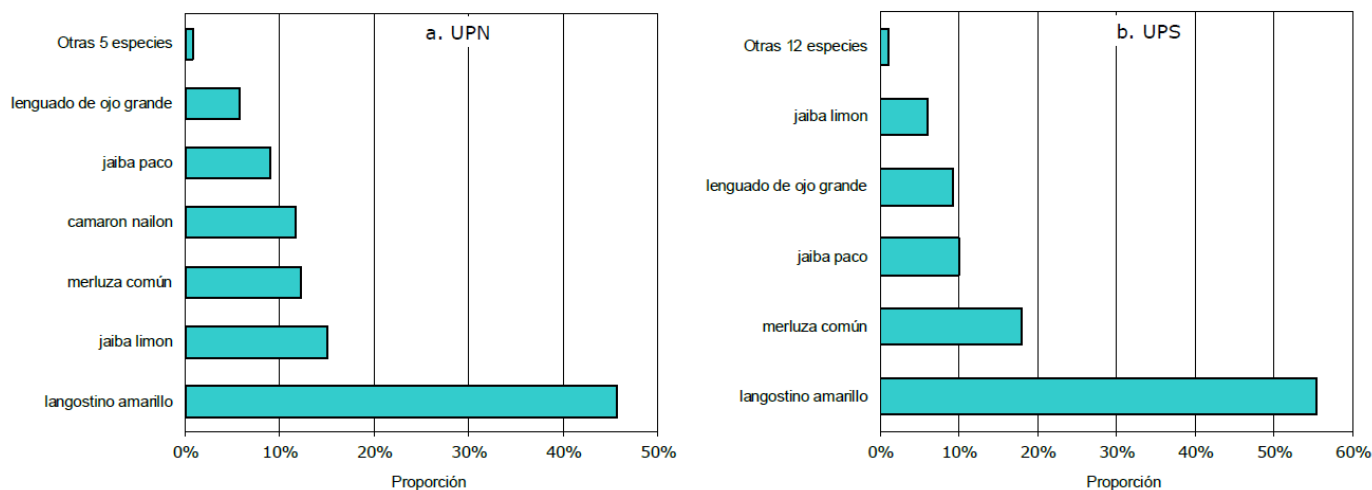
### Red squat lobster fishery

9 specific samples of bycatches were carried out at the red squat lobster in the Northern Fishery Unit (UPN), in which the capture of 11 species was recorded; in this unit, the target species represented 71.4% of the total captured, followed in importance by the yellow squat lobster with 13.1%, jaiba limón (*Cancer porteria*) and the common hake with 3.5% (**Figure 4.2.7.13**). In the Southern Fishery Unit (UPS), 102 samplings were carried out, and a total of 17 different species were recorded. The target species reached 77,1% and the species that recorded the highest percentages were: yellow squat lobster with 12,7%, common hake (4,1%), and jaiba paco (*Mursia gaudichaudi*) (2,3%).



**Figure 4.2.7.13.** Species composition by weight in the total catch, in sets targeting red squat lobster in UPN (left panel) and UPS (right panel), year 2019. Source: Zilleruelo et al 2020

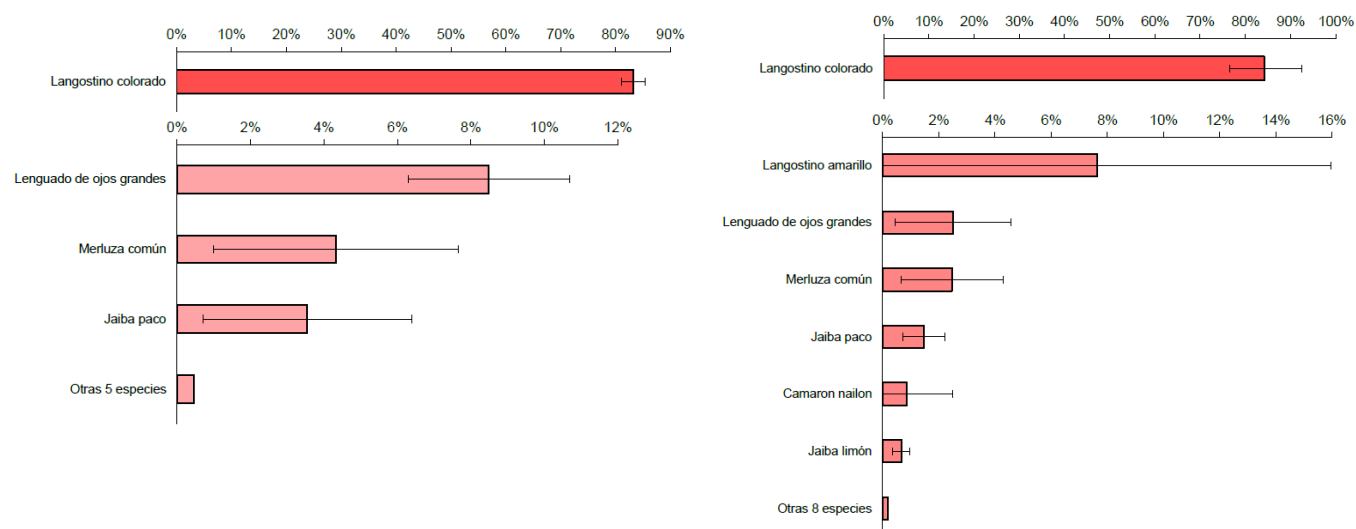
Yellow squat lobster accounted for 46% of the bycatches in the UPN, followed by jaiba limón (15%), common hake (12%) and nylon shrimp (12%) (**Figure 4.2.7.14**). In UPS yellow squat lobster also accounted for the majority of the bycatches (56%), followed by common hake (12%).



**Figure 4.2.7.14** Species composition of the bycatches (in weight), in sets targeting red squat lobster UPN (left panel) and UPS (right panel) in 2019. \* The category "other 18 species" is composed of the 18 species that individually do not reach 1% of the total catch. Source: Zilleruelo et al 2020.

In 2020, the number of specific samplings for bycatches decreased to 25 due to the difficulties derived from the pandemic. Of these, 9 were carried out in the UPN with the presence of 9 species and 16 in the UPS with a record of 15 species (Zilleruelo et al 2021). The target species (red squat lobster) in the UPN reached 83% of the total caught and 84% in the UPS (**Figure 4.2.7.15**).

Big-eye sole accounts for more than 8% of the total catch in the UPN, followed by common hake (4%) and jaiba paco (3,8%), while in the UPS the yellow squat lobster is the most common non-target species caught (accounting for 7,9% of the total catches), followed by big-eye sole (2,1%) and common hake (2,1%) (**Figure 4.2.7.15**).



**Figure 4.2.7.15** Proportion of species by weight in the total catch, in sets targeting red squat lobster in the ZCN (left panel) and the ZCS (right panel), year 2020. \* The category "other species" is composed of species that individually do not reach 0,3% of the total catch. Source: Zilleruelo et al 2021.

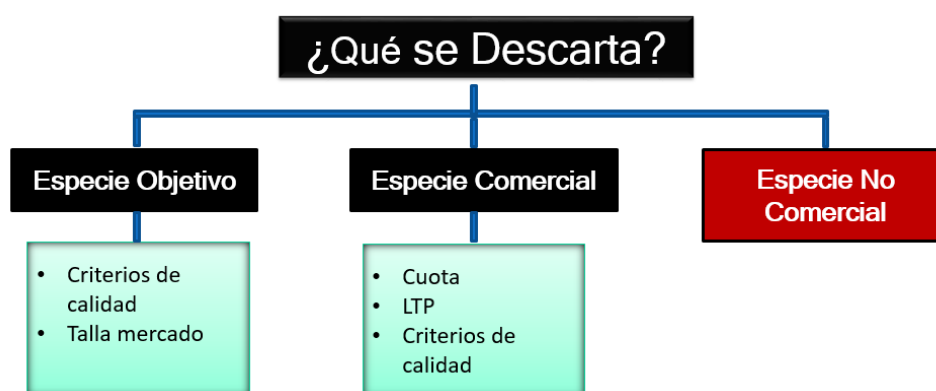
### 4.2.7.3 Discarded fraction

Discards caused by these fisheries on target species, other retained species (such as common hake) and also on non-commercial species have been an issue of concern. In order to respond to these concerns, IFOP implemented a research program on discards and incidental catches on demersal crustacean fisheries between 2013 and 2015. The ultimate goal of the program was to compile the technical background to allow the design of the Plan for the reduction of discards which was finally approved in 2017 (Resolution N°1106/2017).

The Final Report was published in 2017 as San Martin et al (2016) and it was discussed in the first surveillance audit report (Saa et al 2018). This report provided exhaustive and comprehensive information in relation to discards of target, bycatch and discarded species between 2013 and 2015. Monitoring continued during 2016 and 2017, and the results are presented in Bernal et al (2017) and Escobar et al (2018) respectively. Further, during previous surveillance audit, IFOP handed a PowerPoint presentation summarising the information compiled between 2014-2018. The results of this presentation were presented in the previous surveillance audit report (Saa et al 2020).

These reports provide also detailed analyses on the spatio-temporal trends of the discards, size of the discarded individuals from target species, causes of the discards, and even on the places on board where the discards are taking place. All this information helped in the implementation of the monitoring system based on cameras on board.

The reasons for discarding are also recorded and reported. These reasons vary depending on whether the discarded species is the target species, non-target commercial species or non-commercial species (see **Figure 4.2.7.16**). The reasons for discarding target species are: (i) quality criteria, (ii) size. The reasons for discarding non-target commercial species (common hake, nylon shrimp and squat lobsters) are: (i) quota; (ii) Transable Fishing Licence (LTP); (iii) quality criteria. While for non-commercial species discarding is not prohibited (but since the EMS are in place these discards shall be shown to the cameras before being thrown to the sea).



**Figure 4.2.7.16** Reasons for discarding. Source: Escobar et al 2019b

**Table 4.2.7.1** list all species subject to the discard ban. This list includes all target and bycatch species regulated through an annual catch limit (either CGA or LTP), plus some other species subject to catch zero regulations (e.g. raya Espinosa), obligation to be returned to the sea (benthic crustaceans, such as jaibas, in this case since 2019).

**Table 4.2.7.1.** Species subject the discard ban which shall be returned to the sea, according to Article 7A from the LGPA. Source: Escobar et al 2021

Nombre común	Categoría	Estado Administrativo	Condición Plan Reducción
Camarón nailon		LTP - %ART	
Langostino amarillo	Especie objetivo	LTP - %ART / PEP	Prohibición de descarte (1)
Langostino colorado		LTP - %ART / PEP	
Jaiba limón			
Jaiba mármola	Fauna Acompañante sin CGA	Regimen General de Acceso	Devolución obligatoria (2)
Jaiba mora			
Jaiba paco			
Blanquillo			Prohibición de descarte (3)
Cojinoba			
Congrio negro			
Alfonsino	Fauna Acompañante con CGA	Veda Extractiva	Prohibición de descarte (4 y 2)
Besugo			
Orange roughly			
Raya volantin			
Bacalao de profundidad	Fauna Acompañante con CGA	CGA	Prohibición de descarte (4)
Congrio dorado		CGA	
Jibia		CGA	
Merluza común		LTP - %ART	
Raya espinosa	Fauna Acompañante sin CGA	Veda Extractiva	Prohibición de descarte (3)

During current surveillance audit, SUBPESCA handed to the team the report on discards, which includes the period 2019 (Valeria et al 2020) and IFOP handed a PowerPoint presentation summarising the results obtained taking into account the entire 2020 (Escobar et al 2021).

The percentage of observed trips increased in 2019. However, due to the Covid-19 pandemic, the percentage of observed trips decreased significantly in 2020 (see **Table 4.2.7.2**).

Data on interactions with birds and marine mammals during 2019 were already presented in the previous surveillance audit report (Saa et al 2020).

**Table 4.2.7.2.** Annual observer coverage for the 2 fisheries targeting demersal crustaceans in Chile (nylon shrimp, red squat lobster and yellow squat lobster). Source: Elaborated by the team based on data presented in Escobar et al 2021

		2013	2014	2015	2016	2017	2018	2019	2020
<b>Red squat lobster fishery</b>	Observed trips (%)	8	20	25	19	19	14	23	4
	Observed sets (%)	34	21	21	19	17	18	15	17
<b>Yellow squat lobster fishery</b>	Observed trips (%)	1	11	21	19	17	11	42	9
	Observed sets (%)	36	29	23	23	22	20	18	21

The following conclusions are presented in Escobar et al 2021:

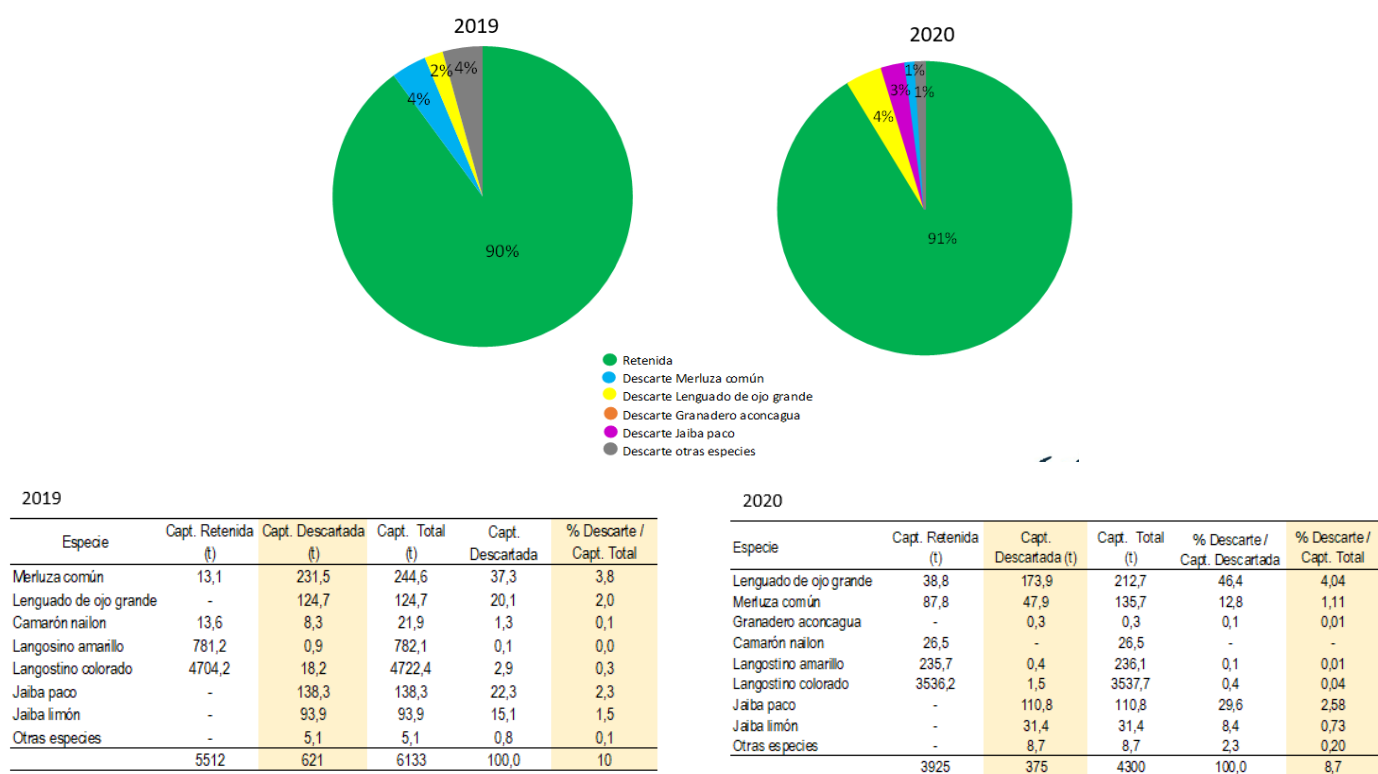
- Three years after the implementation of the Plan to Reduce Discard and Capture of Incidental Fishing in the demersal crustacean fishery, the low level of discards of target species is confirmed, with lower percentage values at 1% with respect to the total discarded fraction for all three fisheries.
- There is a decrease in the percentage of discards for all three fisheries compared to those evaluated during 2019.
- Although a high number of species are caught in these fisheries, only a few contribute 95% of the total catch weight. Those that concentrate the highest discard percentages are: aconcagua grenadier, common hake, big-eyed sole, Chilean grenadier, jaiba paco and jaiba limon.
- Crustaceans are the second most recurrent group in discards, however, they do not represent more than 3% of the total catch. Among the most relevant species are the jaiba paco (*Mursia gaudichaudi*) and jaiba limon (*Cancer porteri*), species that according to current regulations must be returned to the sea (R.Ex. N ° 2820/2019).
- The main causes of discard correspond to "non-commercial species", which is related to the lack of market for some of the species comprising the accompanying fauna. In the case of the target species, the main causes correspond to administrative reasons (% of accompanying fauna and closure), operational (plant requirements and sets with little fishing) and quality (request from the processing

plant). In particular - for common hake - the main cause in the three fisheries was for administrative reasons (% of accompanying fauna and exceeding the quota).

- Regarding the mitigation plan, the species that have a discard ban decreased their percentages (e.g. common hake) (R.Ex. N ° 2820/2019).

### Red squat lobster fishery

**Figure 4.2.7.17** shows that the discarded fraction comprised 10 and 9% of the total catches in the red squat lobster fishery in 2019 and 2020 respectively. Although the species composition of the discarded fraction presents interannual variations, most of the discards are comprised by 4 species: common hake, big-eye sole and jaiba paco, and jaiba limon. Observed discarded volumes per species are presented in **Figure 4.2.7.17**.

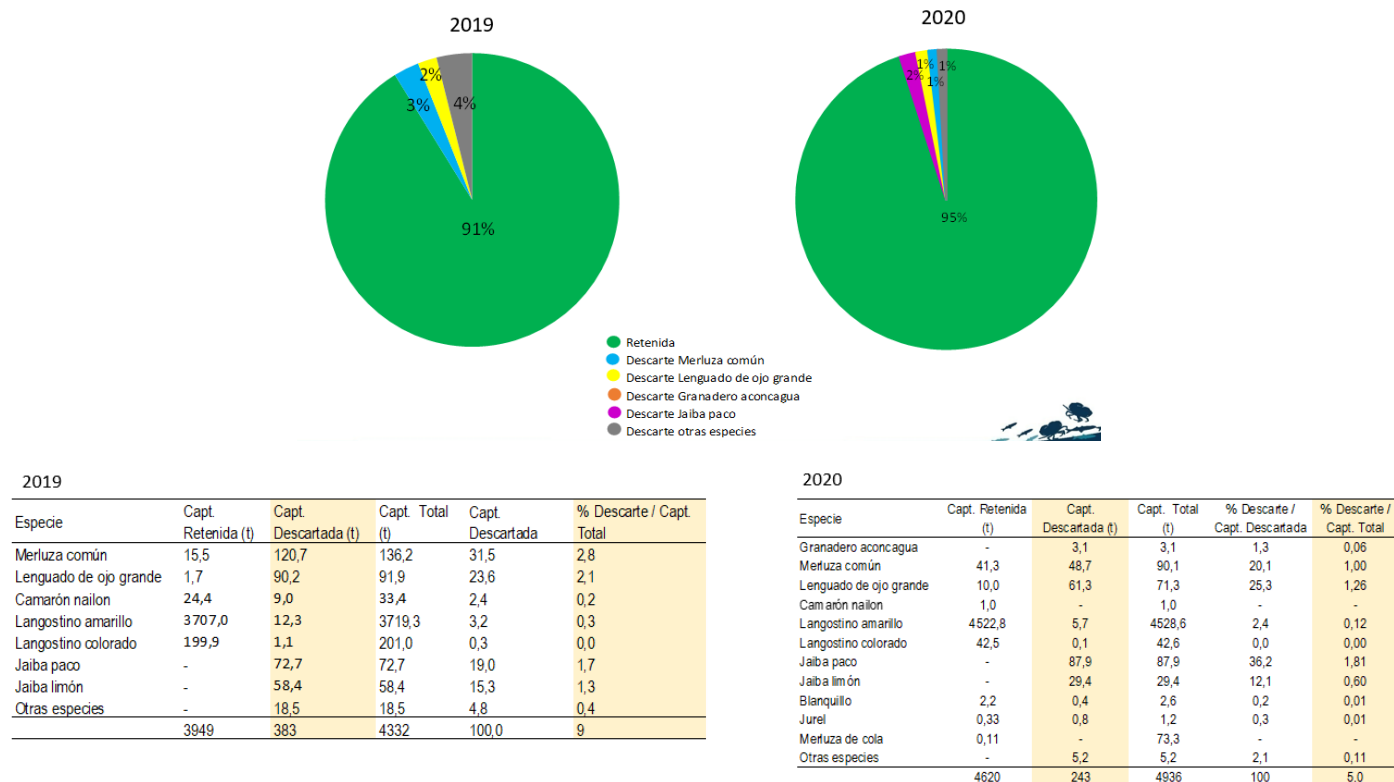


**Figure 4.2.7.17.** Pie graphs show the retained catch (green) versus the main species comprising the discarded fraction in the red squat lobster fishery. Blue for Common hake; yellow for Big-eye sole; orange for Grenadier Aconcagua; purple for Jaiba paco; grey for Others. Tables below show the detailed composition of the discarded fraction. Source: Escobar et al 2021.

### Yellow squat lobster fishery

**Figure 4.2.7.18** shows that the discarded fraction comprised 9 and 5% of the total catches in the yellow squat lobster fishery in 2019 and 2020 respectively. Although the species composition of the discarded fraction presents interannual variations, most of the discards are comprised by 4 species: common hake, big-eye sole and jaiba paco, and jaiba limon. Observed discarded volumes per species are presented in **Figure 4.2.7.18**.





**Figure 4.2.7.18** Pie graphs show the retained catch (green) versus the main species comprising the discarded fraction in the yellow squat lobster fishery. Blue for Common hake; yellow for Big-eye sole; orange for Grenadier Aconcagua; purple for Jaiba paco; grey for Others. Tables below show the detailed composition of the discarded fraction. Source: Escobar et al 2021.

#### 4.2.7.4 Incidental interactions with birds, turtles and marine mammals

During the site visit it was confirmed by all the stakeholders that the implementation of the tori-lines as adopted in Res.Ex.Nº2941/2019 is subject to be modified for this fleet, since the net is hauled by the side of the vessel (not by the stern). So, this issue is being reviewed by SUBPESCA together with representatives of the fishing sector. No specific decision on this issue was communicated to the team during the surveillance audit. Escobar et al 2021 states that the level of compliance with the implementation of tori-lines on board the fleets targeting demersal crustaceans is good.

More effort on quantifying incidental catches with birds, turtles and marine mammals has been placed since 2016 (initially the focus was on the discarded fraction of the catch). The occurrence of interactions and fatalities are low and restricted to the South America sea lion (*Otaria flavescens*) and 7 species of seabirds (see **Table 4.2.7.4** below). Two reports are providing information on this issue:

##### Reports on the monitoring of the demersal crustacean fisheries

Zilleruelo et al 2020 and Zilleruelo et al 2021 present data recorded by observers on board vessels targeting yellow and red squat lobster along the Chilean coast in 2019 and 2020 respectively. **Table 4.2.7.3** shows the number of sampling for incidental catches of birds, marine mammals and turtles for each of the demersal crustacean fishery (nylon shrimp, yellow squat lobster and red squat lobster).

**Table 4.2.7.3.** Number of sets observed for incidental capture of birds, mammals and turtles for each fishery during 2019 and 2020. Sources: Zilleruelo et al 2020 and Zilleruelo et al 2021

Target species	2019	2020
Nylon shrimp	682	338
Yellow squat lobster	349	302
Red squat lobster	316	86
<b>TOTAL</b>	<b>1347</b>	<b>726</b>

As a result, the following fatalities were recorded and reported:



- Nylon shrimp fishery: 1 Salvin albatross (*Thalassarche salvini*), 2 common sea lions (*Otaria flavescens*) and 1 Pelicanus (*Pelecanus thagus*).
- Yellow squat lobster fishery: 1 common sea lion.
- Red squat lobster: 2 common sea lions.

However, information on interactions with birds or marine mammals presented at the monitoring reports is still preliminary and limited to observed interactions (no scaled-up estimates and/or spatial-temporal analyses), since this information will be further reviewed and analysed at the reports on the research plan on discards and incidental catches (see bullet below) which are normally published later on.

No interactions with sea turtles or cetaceans were reported during 2019 and 2020.

### **Reports on the research plan on discards and incidental catches**

The research plan on discards includes among its objectives the need to quantify and analyse occurrence of interactions with seabirds, turtles and marine mammals. The latest report on the research plan on discards and incidental catches is Valeria et al 2020, accounting for incidental catches in 2019 (the report accounting for incidental catches in 2020 was still under revision when this report was being prepared).

Table below shows the annual effort devoted to observing incidental catches in the fisheries targeting demersal crustaceans since 2016. In 2019, the coverage slightly increased compared to previous years: 25% of the trips and 12% of the sets were observed.

**Table 4.2.7.4** Indicators of the effort devoted to observing incidental catches in the fisheries targeting demersal crustaceans. Source: Valeria et al 2020

Año	Operación anual (*)		Datos observados				Estimados poblacionales		Coberturas de observación		
	Barcos	N° viajes Totales	Barcos Obs.	Viajes Observados	Esfuerzo (h/arr)	Lances	Esfuerzo total (h/arr) (SD)	Lances totales estimados (SD)	Viajes (%)	Lances (%)	Esfuerzo (%)
2016	18	1.637	15	201	1.982	810	32.786 (1,26)	10.482 (451)	12	8	6
2017	18	1.484	16	244	1.890	817	32.045 (756)	10.570 (315)	16	8	6
2018	17	1.507	15	297	2.714	1.209	28.063 (718)	10.224 (291)	20	12	10
2019	15	1.265	15	312	2.990	1.347	25.445 (576)	10.927 (226)	25	12	12

\* Información Sernapesca

Main results included in Valeria et al 2020 are presented below.

#### **a. Seabirds**

In relation to the incidental catch and mortality of seabirds in the demersal crustacean fleet (CRU), a single fatality was recorded: 1 individual of Salvin's albatross species (*Thalassarche salvini*) in 2019. This result confirms the low interaction between these fisheries and seabird observed throughout the historical series (see Saa et al 2020 for a summary on previous studies). Due to this low interaction no estimates were performed in 2020 (unlike in the previous annual report).

However, preliminary results for 2021 mentioned in Escobar et al 2021 states that the estimates made for the different species of seabirds caught incidentally during the study show clear improvements in the adjustments over the last three years.

According to Escobar et al 2021, the mitigation measures incorporated in Resolution No. 2941/2019 for trawling gear are aligned with the recommendations suggested to the member countries of the Agreement on the Conservation of Albatrosses and Petrels (ACAP).

#### **b. Marine mammals**

Results shown in Valeria et al 2020 confirm that the common sea lion (*Otaria flavescens*) is the only species of marine mammal present as bycatch in fisheries targeting demersal crustacean. The demersal crustacean fisheries have historically presented few incidental catches of marine mammals. A total of 6 specimens were found to interact in 2019. Regarding the mortalities of the captured specimens, unlike in 2018, where no mortality was recorded, in 2019 the mortality was 100% of the observed interactions.

Spatially, incidental catches did not show great differences in their geographical distribution with respect to previous years, while, temporarily, the largest catches were generally concentrated during the second semester, especially in the spring months (August-November).

Although the estimates of the number of sea lions caught incidentally by the crustacean fishery have shown differences between the approximations used during the evaluated period, in 2019 there was an increase in the total estimated interactions, changing the decreasing trend that had been recorded. The number of total sea lions impacted by the fishery was between 28 and 42, depending on the method used (**Table 4.2.7.5**). In any case, the low capture rates stand out, despite the increase presented in 2019.

Regarding the mortality estimates, contrary to the decreasing trend of the historical series or even absent in 2018, during 2019 all incidental catches resulted in fatalities.

**Table 4.2.7.5** Estimation of the number of mammals caught in the demersal crustacean fishery, from Simple Random Sampling (MAS) with ratio estimator and by conglomerates using means estimator. CV (Coefficient of Variation) and CI (confidence intervals) with lognormal approximation for the ratio estimator, period 2016-2019. Source: Valeria et al 2020

Año	Especie	Capt. Obs.	Tasa	Muestreo Aleatorio Simple				Muestreo por conglomerado				
				Estimador de razón				Estimador de medias				
				CV	N	CV	Linf-Lsup	CV	N	CV	Linf-Lsup	
				tasa (%)		tasa (%)		tasa (%)		tasa (%)		
2016	Lobo marino	5	0,007	43	105	43	47-236	0,007	51	70	51	1-139
2017	común	6	0,006	39	94	39	44-197	0,005	44	49	44	7-92
2018	( <i>Otaria</i>	1	0,001	94	10	94	2-45	0,001	92	7	93	0-21
2019	<i>flavescens</i> )	6	0,003	54	42	54	16-114	0,003	52	28	52	0-55

#### 4.2.7.5 Interactions with habitats

The agreement signed in 2019 between SERNAPESCA and the Global Fishing Watch (GFW) to make its fishing fleet tracking data publicly available is still in force. This means that all movements from commercial fishing vessels flying the Chilean flag can be tracked in near real-time using at the GFW website: <https://globalfishingwatch.org/press-release/chile-to-publish-vessel-tracking-data-through-gfw/>

This agreement follows the Chilean Senate's approval of Law 21.132 earlier in 2019 that requires that national fishing vessel tracking information to be publicly available.

No specific information on the spatial-temporal pattern of the Camanchaca fleet was handed by the client this year.

### 4.3 Version details

Details on the version of the fisheries program documents used for this assessment are presented in table below.

**Table 4.3.1 Fisheries program documents versions**

Document	Version number, date of publication (and date effective)
MSC Fisheries Certification Process	Version 2.2, 25 March 2020 (25 September 2020)
MSC Fisheries Standard	Version 2.0, 1 October 2014 (1 April 2015)
MSC General Certification Requirements	Version 2.4.1, 7 May 2019 (28 September 2019)
MSC Surveillance Reporting Template	Version 2.1, 25 March 2019 (25 March 2019)

## 5 Results

### 5.1 Surveillance results overview

#### 5.1.1 Summary of conditions

**Table 5.1.1** lists the conditions raised in the PCR of the fishery, and also presents their status after current surveillance audit.

**Table 5.1.1** Summary of Assessment Conditions, detailing status after current surveillance audit

Condition #	Performance indicator (PI)	Status	PI original score	PI revised score in 4SA
1	1.1.1 (UoA1)	CLOSED in 2 SA	70 (revised to 90)	NA
2	1.2.3 (Both UoAs)	<b>AHEAD TARGET</b>	65	<b>NA</b>
3	2.3.3 (Both UoAs)	CLOSED in 3SA	70 (revised to 80)	NA
4	2.4.1 (Both UoAs)	CLOSED in 3SA	70 (revised to 85)	NA
5	2.4.2 (Both UoAs)	CLOSED in 3SA	75 (revised to 85)	NA
6	3.2.1 (Both UoAs)	CLOSED in 1SA	70 (revised to 100)	NA
7	3.2.3 (Both UoAs)	<b>CLOSED</b>	75	<b>80</b>
8	1.2.4 (Both UoAs)	<b>ON TARGET</b>	90 (revised to 65 in 2SA)	<b>NA</b>

### 5.1.2 Total Allowable Catch (TAC) and catch data

There is a closed season for red and yellow squat lobster from January 1<sup>st</sup> to March 31<sup>st</sup>, during the moulting and mating period. Further, all demersal crustacean fisheries in Regions V-VIII are closed in September, which is the time of peak abundance of egg-bearing females. Therefore, the certified fishery is open 8 months per year.

The fishery got the MSC certificate on the 9<sup>th</sup> of February 2017, just before starting the 2017 fishing season. Thus, the certification covered the entire 2017 fishing season, while in 2016 was still under assessment. TACs issued between 2016 and 2020 for red and yellow squat lobsters in Regions V-VIII are shown in **Table 5.1.2.**, together with UoA or UoC quotas and catches (UoA and UoC are the same in this fishery). Data from 2016 are presented in order to continue the data series presented in the PCR. As stated before, UoC catches from 2016 were not covered by the certificate, only UoC catches from 2017 to 2020 are MSC-certified. In 2020, UoC catches represented 79,79% and 37,96% of the TACs issued for red and yellow squat in Region V-VIII respectively.

**Table 5.1.2.** TACs, UoAs and UoCs quotas and UoC catches in 2016-2020. Source: SERNAPESCA

	Year	Target TAC (t)	Total Chilean landings(*) (t, green weight)	UoC Quotas(**) (t)	UoC landings (***) (t, green weight)	UoC Catches Vs Target TAC (%)
UoA1 (red squat lobster)	2016	4,618 <sup>(i)</sup>	4,428	3,943	NA	NA
	2017	4,673 <sup>(ii)</sup>	4,589	4,103	4,060	86.88%
	2018	4,662 <sup>(v)</sup>	4,535	3,333	3,318	71.17%
	2019	4,662 <sup>(vii)</sup>	4,571	3,928	3,648	78,26%
	2020	5,348 <sup>(ix)</sup>	5,195	3,791	3,787	70,81%
UoA2 (yellow squat lobster)	2016	1,830 <sup>(iii)</sup>	1,785	1,223	NA	NA
	2017	1,900 <sup>(iv)</sup>	1,877	1,563	1,393	73.32%
	2018	1,890 <sup>(vi)</sup>	1.869	840	835	44.18%

<b>2019</b>	1,960 <sup>(vii)</sup>	1,894	1,330	1,001	51,07%
<b>2020</b>	1,960 <sup>(x)</sup>	1,849	750	744	37,96%

(\*) Total landings performed by the Chilean demersal trawl fleets targeting those stocks

(\*\*) Quotas allocated to Camanchaca

(\*\*\*) Tonnes landed by Camanchaca. No certified catches during 2016, the fishery was still under assessment

(i) Global total quota for red squat lobster in 2016: 4,750 t., Target quota 2016: 4,618 excluding quota for research and by-catch and research. Se tiene asignado el 97,5% de la cuota objetivo (ii) Global total quota for red squat lobster in 2017: 4,798 t., Target quota 2017: 4,673 excluding quota for research and by-catch; (v) global total quota for red lobster in 2018 4,662 t. excluding quota for research and by catch; (iii) Global total quota 2016: 1,880 t. Target quota 2016: 1,830 t excluding quota for research and by-catch and Research; (iv) Global total quota for yellow squat lobster in 2017: 1,954 t. Target quota 2017: 1,900 t excluding quota for research and by-catch. (vi) global total quota for yellow lobster in 2018 1,890 t. excluding quota for research and by catch; (vii) quota for red squat lobster UPS, 4,798 t., target quota 4,662 t. excluding research and secondary quotas. (viii) quota for yellow squat lobster UPS in 2019, 2,027 t., target quota 1,960 t., excluding research and secondary quotas. (IX) cuota langostino Colorado UPS en 2020, 5,528 t. cuota objetivo 5,348 t. excluidas cuota de investigación y fauna acompañante. (X) cuota langostino Amarillo UPS en 2020, 2,027 t. cuota objetivo 1,960 t. excluidas cuota de investigación y fauna acompañante.

## 5.1.3 Recommendations

### 5.1.3.1 Follow-up of previous Recommendations

**Table 5.1.3 Recommendation 1 (UoA1).** Withdrawn at 2SA.

**Table 5.1.4: Recommendation 2 (All UoAs).** Withdrawn at 3SA

**Table 5.1.5: Recommendation 3 (UoA 1).** Withdrawn at 3SA

### 5.1.3.2 New Recommendation

As indicated in section 4.2.4.2, Law 21,259 postpones until January 1, 2024 the enforcement of the EMS onboard the artisanal vessels ≥15m length. Besides, the Sernapesca representatives shared with the team that they are interested in starting a pilot project with the artisanal fleet as soon as possible, but they need candidates for voluntary trials. The UoA of this fishery includes a single artisanal vessel, but the team decided to set a new recommendation on this matter:

**RECOMMENDATION:** Artisanal shipowners included in the UoA are urged to voluntarily collaborate with the SERNAPESCA incorporate the image recording cameras on board as soon as possible, so that all vessels included in the UoA have the ESM installed on board.

## 5.2 Conditions

### 5.2.1 Condition 1 (UoA1)

Closed at 2SA.

### 5.2.2 Condition 2 (All UoAs)

Performance Indicator	1.2.3
Score	75
Justification	<p><b>PCR, 2017:</b></p> <p><b>SI (b).</b> “It is clear that there is significant discarding of individuals under the commercial size in both fisheries, and that the level of discarding is not full quantified”</p> <p><b>SI(c).</b> “Squat lobsters are also caught in other fisheries when they are not the target species. In the nylon shrimp fishery these landings will be recorded and included in the annual global quota. However small catches of yellow squat lobster occur in the fisheries targeting red squat lobsters and vice versa, and the assessment team were informed that landings recorded on behalf of SERNAPESCA through the dockside monitoring programme do not</p>

	<p><i>differentiate between the two species, and so some removals of both squat lobster species are not fully recorded.”</i></p> <p><b>3SA report (2020):</b></p> <p><b>SI(b).</b> <i>“However, there are concerns with the reliability of the assessment approach due to uncertainties in the model as well as the survey.” (...) “The assessment team concluded that concerns regarding discarding of the target species have been resolved but the SG80 is still not met because of the concern remaining for the reliability of the assessment approach”.</i></p>
Condition	<p>By the second annual audit of the second certificate cycle, the client should demonstrate that the stock abundance and UoA removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule. It is will be also necessary to confirm that there is good information on all other fishery removals from the stock.</p> <p><i>NOTE: The condition was modified at the third surveillance audit, and the deadline for closing the condition has been modified in accordance with MSC Covid-19 derogations.</i></p>
Condition start	February 2017
Condition deadline	<p>August 2024 (due to the 6-month MSC Derogation (<a href="https://www.msc.org/docs/default-source/default-document-library/stakeholders/covid-19-pandemic-derogation-march-2020.pdf">https://www.msc.org/docs/default-source/default-document-library/stakeholders/covid-19-pandemic-derogation-march-2020.pdf</a>) and the 1-year Conditions derogation due to the pandemic (<a href="https://www.msc.org/docs/default-source/default-document-library/for-business/program-documents/chain-of-custody-supporting-documents/msc-derogation-6-covid-19-fishery-conditions-extension.pdf">https://www.msc.org/docs/default-source/default-document-library/for-business/program-documents/chain-of-custody-supporting-documents/msc-derogation-6-covid-19-fishery-conditions-extension.pdf</a>), the deadline was postponed from February 2023 on to August 2024).</p> <p><i>NOTE: Original deadline set at the PCR was February 2020 (3<sup>rd</sup> year of the first certificate cycle). However, exceptional circumstances (which also included the 6-month MSC derogation) were considered at 3SA after the condition was modified. The reasons for claiming exceptional circumstances were the same as for Condition 8 on PI 1.2.4 set at 2SA. A Variation Request on this matter (against FCP v.2.1 7.18.1.5) was approved by the MSC on July 31, 2020.</i></p>
Milestones	<p><b>At the first annual audit</b>, the client should provide evidence to the CAB that options for quantifying the level of discarding of target species in both fisheries have been considered, and that a mechanism has been put in place for differentiating between landings of squat lobster species in the dockside monitoring programme. Expected score 65.</p> <p>(Revised at SA1) <b>At the second annual audit</b>, the client should provide evidence to the CAB that a mechanism has been put in place to quantify the level of discarding of target species in both fisheries in accordance with Resolution 1106/2017 and that the integral traceability system is being used to ensure that landings of squat lobster species are fully differentiated.</p> <p>(Revised at SA1) <b>At the third annual audit, the client should provide evidence to the CAB that the level of discarding of target species is fully quantified in both fisheries, and that landings of squat lobster species are fully differentiated. Expected score 80.</b></p>
Revised milestones (3rd Surv audit)	<p>At 3SA became apparent that there were concerns with the reliability of the assessment approach such that it cannot be concluded that abundance is regularly monitored at a level of accuracy and coverage consistent with the harvest control rule. As a result, milestones were revised to address SI(b).</p> <p>In addition, dates were again modified at the 4<sup>th</sup> SA to address MSC derogations:</p> <p><b>Year 1 (2021/2022):</b> During reassessment, the client shall provide evidence that the development of a more reliable approach for accurately monitoring stock abundance will be</p>



	<p>addressed through the review of the current assessment approach in line with condition 8. No re-scoring expected at this stage.</p> <p><b>Year 2 (August 2023):</b> By the first surveillance audit of the second certificate cycle, the client shall provide evidence that methods for developing a more reliable assessment approach for accurately monitoring stock abundance have been identified in line with condition 8. No re-scoring expected at this stage.</p> <p><b>Year 3 (August 2024):</b> By the second surveillance audit of the second certificate cycle, the client should demonstrate that a more reliable assessment approach for accurately monitoring stock abundance has been developed in line with condition 8. <b>SG80 should be met at this stage.</b></p> <p><i>NOTE: Deadlines for milestones have been modified in accordance with MSC Covid-19 derogations.</i></p>
Consultation on condition	<p><i>PCR, 2017 "The consultation was done with the concerned Entities. See letters from SUBPESCA, SERNAPESCA and IFOP (Appendix 4)."</i></p>
Progress Condition (1SA)	<p>The audit team approves of recent initiatives toward reducing the level of discarding of target species through implementation of the Plan for the reduction of discards in fisheries targeting demersal crustaceans (Resolution 1106 issued on the 29th of March 2017). This Resolution establishes a landing obligation on target species (in this case on yellow and red squat lobsters). Discards will only be allowed if, previous to discarding, they are segregated by species, placed in boxes so they can be quantified by the cameras on board. Further, those discards shall be reported. Any discards of target species performed under non-compliance with the previous measures will be illegal and susceptible to be sanctioned in accordance to the National Fishing Law.</p> <p>However this Regulation has not yet been implemented as SERNAPESCA has to adopt the measures to enforce it. During the site visit the assessment team checked that SERNAPESCA is working on the fishery-specific Resolutions to implement onboard surveillance systems using cameras (for more details see section 2.6 on Compliance). However, the Plan is still not enforced and the effectiveness of the surveillance system is currently uncertain. Accordingly there remains a requirement to quantify unreported catch due to discarding. A recent study resulted in estimates of discarding of the target species in the southern red squat lobster fishery of 6% and 7% in 2014 and 2015 respectively. Incorporation of those results in several modelling scenarios resulted in little effect of discards on predictions of F and SB3. However, discarding is likely to vary annually with changes in exploitable biomass, size composition, and patterns of fishing relative to resource distribution. Since regulations prohibit discarding, it will likely be difficult to routinely obtain reliable estimates from regular fishing operations.</p> <p>SERNAPESCA is now finishing the implementation of an integral traceability system (for more details see section 2.7 on Traceability). Once all processing plants have implemented this system (official deadline is June 2018) the catch composition data stated at the landing declaration (which is taken from the dockside sampling commissioned by SERNAPESCA) will be adjusted considering data obtained by the processing plants (SERNAPESCA official letter N°116292/2017 provides a five-day period to do so). As processing requirements for the two species of squat lobsters are different (boiling time is longer for the yellow squat lobster), processors ensure that species are properly sorted before being processed. Therefore, this new procedure provides the possibility to adjust landing declarations to reflect species catch composition more accurately. However, at present the system is still not implemented in most of the plants processing demersal crustaceans and therefore this is as yet uncertain. During the site visit it was confirmed that the Camanchaca processing plant has already implemented the new traceability system.</p> <p>Existing milestones focus on the adequacy of dockside sampling program for achieving an accurate estimation of the landing of each squat lobster species. However, as explained above (and also in <b>section</b> ¡Error! No se encuentra el origen de la referencia.) the traceability</p>



		<p>system which is being implemented constitutes a powerful tool to obtain accurate estimations of the species composition of the landings (not only the two species of squat lobsters). Thus, the audit team proposes revised milestones for the subsequent years (see below).</p>																												
Progress Condition (2SA)	on	<p>During the site visit, it came clear that the integral traceability system is now fully operative for demersal crustacean fisheries in Chile. This, coupled with the dockside sampling program ensures that accurate estimation of the landings corresponding to each squat lobster is ensure. None of the interested parties interviewed raised concerns regarding the possibility that the landed proportions of both squat lobster species are being miscalculated. Therefore, the team dismisses this problem raised during the initial assessment.</p> <p>The Plan for the reduction of discards in fisheries targeting demersal crustaceans (Resolution 1106 issued on the 29th of March 2017) is still not being implemented since SERNAPESCA is still working in setting the conditions to ensure its monitoring and enforcement. Despite the implementation of the system based on the cameras on board is somewhat delayed in relation to what was planned, the team could verify that the necessary steps are being taken for their implementation, including tenders and complex consultation periods (consult the <b>section 2.9</b> of the report for more details). In the case of the demersal crustacean fisheries the system is expected to start running in July-August. However, a moratoria in the enforcement of sanctions will be applied until the system has been tuned.</p> <p>In any case, the on board observer program derived from the research plan on discards has been maintained throughout these years. This has allow keeping providing detailed estimates on the discards occurring in the different demersal crustaceans fisheries. The levels of sampling coverage reached in these fisheries (close to 20%, see table below) were high, which allowed obtaining acceptable levels of uncertainty associated with the main species.</p> <p><b>Table 5.2.1. Sampling coverages performed on board as part of the research plan on discards</b></p> <table><tr><th></th><th></th><th>2014</th><th>2015</th><th>2016</th><th>2017</th></tr><tr><td rowspan="2">Red squat lobster</td><td>Trip coverage</td><td>25%</td><td>25%</td><td>19%</td><td>19%</td></tr><tr><td>Haul coverage</td><td>17%</td><td>22%</td><td>19%</td><td>17%</td></tr><tr><td rowspan="2">Yellow squat lobster</td><td>Trip coverage</td><td>13%</td><td>23%</td><td>19%</td><td>17%</td></tr><tr><td>Haul coverage</td><td>25%</td><td>24%</td><td>23%</td><td>22%</td></tr></table> <p>This program has allowed to obtain reliable estimates of the discarded fraction corresponding to the target species in the different demersal crustacean fisheries as shown in <b>Tables 2-5, 2-6 and 2-7</b>.</p> <p>This sampling was also maintained in 2018 and 2019, ensuring the continuity of the data. From 2019 onwards, these estimations are expected to be based on the information collected with the cameras on board.</p>			2014	2015	2016	2017	Red squat lobster	Trip coverage	25%	25%	19%	19%	Haul coverage	17%	22%	19%	17%	Yellow squat lobster	Trip coverage	13%	23%	19%	17%	Haul coverage	25%	24%	23%	22%
		2014	2015	2016	2017																									
Red squat lobster	Trip coverage	25%	25%	19%	19%																									
	Haul coverage	17%	22%	19%	17%																									
Yellow squat lobster	Trip coverage	13%	23%	19%	17%																									
	Haul coverage	25%	24%	23%	22%																									
Progress Condition (3SA)	on	<p>Several regulations were issued in 2019 to move forward in the implementation of the Electronic Monitoring System (EMS), based on the installation of cameras on board in all industrial fishing fleets operating within the Chilean waters. Consequently, SUBPESCA's reviewed the applicable regulations and measures for these fisheries to minimise the discards resulting from the authority's measures. As a result, SUBPESCA carried out a thorough review of every applicable regulation and enacted a series of amendments and adjustments in order to prevent discards. (See Section 4.2.3.4 for more details).</p> <p>From January 1<sup>st</sup>, 2020, the use of image recording cameras on the industrial fleet is in force. A new unit responsible for analysing and auditing that requirement using the collected images, was created. During the site visit, the team checked that SERNAPESCA started to review and report about the images recorded on board the fleet targeting demersal crustaceans. There is only 1 artisanal vessel fishing with the Camanchaca quota. In relation</p>																												

	<p>the artisanal fleet, there is a delay in the requirement for image recording cameras on board this type of fleet. However, the artisanal fleet has 3 more years before the EMS being mandatory.</p> <p>In relation to the traceability, SERNAPESCA and all the stakeholders interviewed during the site visit confirmed that the integral traceability system is in place for all the different stakeholders (fishers, processing plants, etc.) and working normally since 2019 (See section 4.2.5).</p> <p>The integral traceability system is fully operational for demersal crustacean fisheries and, together with the dockside sampling provides reliable estimates of the different squat lobster species in the landings. The observer program derived from the research plan on discards has provided reliable estimates of the level of discards of the target species in the different demersal crustacean fisheries in recent years. Also, the EMS has been fully operational in the Industrial Fleet sector since January 1, 2020. Although the EMS has not yet been fully implemented in the Artisanal Fleet, only a single vessel is affected and regulations now ensure that this will occur within 3 years. Meanwhile, all other measures now in place provide assurance that the level of discarding of target species is (for practical purposes) fully quantified in both fisheries. Based on the above, the progress on this condition was found to be on target, having met the milestone set out for year 3. However, the milestone did not address the concern regarding reliability of the assessment approach in SIb; as a result the condition cannot be closed.</p> <p>Bureau Veritas sent a variation request for application of exceptional circumstances and extend the deadline for this condition aligned with Condition 8. It was approved by the MSC on the 31st of July 2020. As a result, updated milestones were drafted for years 4, 5 and 6 (new certification cycle). See above. An updated action plan was also prepared by the client.</p> <p>Although the condition was not closed, SIc of the PI was rescored.</p>
Progress on Condition (4SA)	<p>Most aspects of this condition have now been resolved, with respect to quantifying discards and differentiating between squat lobster species (see previous surveillance audit report). Only the concern regarding reliability of the assessment approach is not yet resolved and this aspect is directly related to condition 8, which has now been assessed as AHEAD TARGET (see condition 8).</p>
Status	<p>Accordingly, this condition is <b>AHEAD TARGET</b> because of the MSC Covid-19 derogations.</p>
Additional information	

### 5.2.3 Condition 3 (All UoAs)

Closed at 3SA.

### 5.2.4 Condition 4 (All UoAs)

Closed at 3SA.

### 5.2.5 Condition 5 (All UoAs)

Closed at 3SA.

### 5.2.6 Condition 6 (Both UoAs)

Closed at 1SA.

### 5.2.7 Condition 7 (All UoAs)

Performance Indicator	3.2.3
Score	75
Justification	<p>PCR, 2017 “All vessels operating extractive activities in the yellow squat lobster and red squat lobster fisheries are required to operate with an onboard satellite positioning system throughout the fishing trip, with the data sent in real time to both the National Fishing Service and the General Directorate of Maritime Territory. A National Fishing Service-authorized organisation certifies their catches on landing. However, cameras logging images have not been implemented onboard the vessels to date, even though it is a legal requisite, neither are there any inspectors on vessels to provide reliable data about the onboard activities that occur, particularly in terms of discards auditing.</p> <p>Therefore, the monitoring, control, and surveillance mechanisms of the yellow squat lobster and red squat lobster fisheries must show they fulfil the SG80 requisites.”</p>
Condition	In the fourth annual audit, the client must show all the vessels operating in the yellow squat lobster and red squat lobster fishery undertake their extractive activities has demonstrated an ability to enforce relevant management measures, strategies and/or rules.
Condition start	February 2017
Condition deadline	August 2023 (due to the 6-month MSC Derogation ( <a href="https://www.msc.org/docs/default-source/default-document-library/stakeholders/covid-19-pandemic-derogation-march-2020.pdf">https://www.msc.org/docs/default-source/default-document-library/stakeholders/covid-19-pandemic-derogation-march-2020.pdf</a> ) and the 1-year Conditions derogation due to the pandemic ( <a href="https://www.msc.org/docs/default-source/default-document-library/for-business/program-documents/chain-of-custody-supporting-documents/msc-derogation-6-covid-19-fishery-conditions-extension.pdf">https://www.msc.org/docs/default-source/default-document-library/for-business/program-documents/chain-of-custody-supporting-documents/msc-derogation-6-covid-19-fishery-conditions-extension.pdf</a> ), the deadline was postponed from February 2022 to August 2023).
Milestones	<p>In the first audit, the client must provide the CAB with documental evidence of the stakeholders having being informed of the need to have inspectors onboard or to implement the requisite for onboard cameras to record images of the yellow squat lobster and red squat lobster vessels.</p> <p>In the second and third audit, the client must provide the CAB with documental evidence they are working with the stakeholders on the incorporation of inspectors onboard the vessels or the implementation of the requisite to install and continuously operate cameras to record images onboard the vessels throughout the fishing trip. This will enable the detection and recording of all discard actions that occur onboard the vessels.</p> <p><b>In the fourth annual audit, the client must provide the CAB with documental evidence that the yellow squat lobster and red squat lobster fishing fleet carry out their extractive activities either with an inspector on board or with cameras recording images throughout the entire fishing trip, enabling the detection and recording of all discard actions onboard. This would mean a monitoring, control, and surveillance mechanism has been implemented for the fisheries being evaluated, which demonstrates their capacity for applying the relevant management measures, strategies, or guidelines in accordance with the MSC, meeting the SG80 requirement.</b></p>

Consultation condition	on	<i>PCR, 2017 “The consultation was done with the concerned Entities. See letters from SUBPESCA, SERNAPESCA and IFOP (Appendix 4).”</i>
Progress Condition (1SA)	on	<p>The auditors were able to check the publishing of the regulation regulating the compulsory use of on board image recording cameras in the Official Gazette on March 18th 2017, through Decree 76, 2015, which occurred after the fisheries certification.</p> <p>In accordance with the indications of Mr.Fernando Naranjo from the governmental body, SERNAPESCA, work is ongoing on several issues relating to the implementation of the fishing fleet's on board image recording system for auditing discards, which will come into force in November 2018, as explained in point 2.6 of this report.</p> <p>In addition to the above, SERNAPESCA gave presentations in Talcahuano on February 28th 2018 to communicate and educate on the implementation of the discard auditing system for the VIII Region bottom trawling demersal crustaceans fleet.</p>
Progress Condition (2SA)	on	<p>The auditors were able to verify that despite the image recording cameras system not being operational to enable suitable discard auditing, substantial progress has been made towards their use, as indicated in point 2.6 of this report.</p> <p>With the aim of suitably implementing and operating image recording cameras, the ship-owners of fishing vessels used for catching demersal crustaceans provided SERNAPESCA with the requested information relating to the handling protocols for catches, discards, and bycatch for each of their vessels prior to the site visit.</p> <p>On June 12, 2018 SERNAPESCA held an on-site training on the implementation of the discard monitoring program to fleet managers from fishing companies targeting demersal crustaceans in Region VIII. Another meeting with the fishing companies operating in the Region was held in October 12. The aim of this meeting was to update on the implementation of the on-board cameras.</p> <p>During a meeting with Mr. Fernando Naranjo, it was indicated that the image recording cameras were scheduled for implementation in the third quarter of 2019, which was confirmed by Undersecretariat for Fisheries staff at a meeting held during the site visit.</p>
Progress Condition (3SA)	on	<p>In accordance with SERNAPESCA Resolution No. 5930 of 2019, the inspection of discards using an image recording system on board industrial vessels begins on January 1st 2020. The discard image recording system analysis centre was visited during the visit to the SERNAPESCA site, while attending the meeting to collect the background information required for this audit. It was found to be fully operational for all industrial fishery vessels, and it was possible to see the software that they were using to review the fishing hauls from a demersal crustacean trawler vessel during one month.</p> <p>Section 4.2.3.4 of this report indicates every regulation that SERNAPESCA needed to develop and publish to make this inspection tool a requirement. It also includes all the adaptations to administrative and management measures that SUBPESCA needed to apply to the prevent discards resulting from their own administrative measures.</p> <p>Lastly, in section 4.2.4, relating to compliance, there are details of the actions undertaken by SERNAPESCA to collect and analyse image data.</p> <p>As a result of the above, from the vessels corresponding to this UoA, only one of them (the vessel, Tome) does not have operational image recording cameras, given that in accordance with the national fishery regulation, it is classified as an artisanal ship,</p>

		<p>and in accordance with the law (Art. 6 of law 20657 point b), the requirement for image recording cameras for artisanal ships at least 15 metres long will be a requirement 3 years after the date the regulation regulating the activity is published.</p> <p>The regulation is contained in Decree No. 76 of 2015, published in the Official Gazette of March 18th 2017, which in its 1st temporary article repeats the legal regulation indicated earlier regarding the three years after publication in the official regulation gazette.</p> <p>Furthermore, the 2nd temporary article of the Regulation establishes that any Resolutions that SERNAPESCA needs to enact must be established within 6 months of the date of publication of the regulation.</p> <p>It is worth noting that SERNAPESCA and SUBPESCA both needed to enact a large number of regulations to bring this requirement into force on January 1st 2020 for industrial ships, and that SERNAPESCA indicated in a personal communication that the image recording cameras will be a requirement for artisanal vessels three years after January 2020.</p>
Progress Condition (4SA)	on	<p><b>a. Application of mechanisms for monitoring, control and surveillance.</b></p> <p>The auditors were able to verify that in the demersal crustacean fishery of yellow squat lobster, red squat lobster and nylon shrimp, both in the industrial and artisanal fishing sector, a system of monitoring, control and surveillance of the fishery is being applied, highlighting the certification of catches landed by SERNAPESCA staff, the traceability of landings from the catch to the commercialisation of that catch and/or the products derived from it, the use of satellite positioning on board the vessels, the requirement of weighing systems that must be kept calibrated by accredited external entities and the use of image recording cameras on board the industrial fishing fleet since January 2020, which has demonstrated its capacity to implement the relevant management measures, strategies and standards..</p> <p>In the case of this UoC, there is only one vessel, the Tomé, which is not yet legally required to use image recording cameras on board, as it is registered in the artisanal register, although it carries out activities on the yellow squat lobster and red squat lobster fisheries managed with extraordinary fishing permits. According to law 21.259, image recording cameras for artisanal vessels of a length equal to or greater than 15 metres will be required from 1 January 2024. However, during the meeting held as part of this surveillance audit, the Sernapesca representatives shared with the team that they are interested in starting a pilot project with the artisanal fleet as soon as possible, but they need candidates for voluntary trials.</p> <p>According to the information provided by SERNAPESCA, which is detailed in point 2.4.2.4, 8 findings of operations with a high probability of having carried out unauthorised discards have been identified; these situations are under technical-legal analysis to generate the corresponding notifications. It is also noted that the cases under analysis are associated with the fleet with a base port in Coquimbo. The representatives of SERNAPESCA, on the occasion of the current audit, stated (without being asked about the level of compliance of the client) that Camanchaca's fleet was in strict compliance with the regulations regarding on-board handling of species to be discarded and discards of species with quota.</p>
Status		<p><b>a) Implementation of mechanisms for monitoring control and surveillance (MCS)</b></p> <p>In accordance with the above, the team has been able to verify that since the beginning of 2020 a monitoring, control and surveillance system with on-board cameras has been in place, which allows for adequate control of on-board discarding.</p>



	As a result of the above, the progress made in this condition is <b>ON TARGET</b> and the condition is <b>closed</b> . See re-scoring table of PI 3.2.3 in section 5.4.
Additional information	<p><b>The client action plan prepared by the client was:</b></p> <p>Although the fishery of those resources is strictly controlled during fishery operations and landings, with the scientific observers monitoring bycatch fauna and incidental catches, it is worth highlighting that the data collection results are very similar to those provided by the fleet captains themselves. This is because the company has instilled objective data collection into the crew, allowing us to create plans with positive outcomes.</p> <p><u>In the first audit:</u></p> <p>Camanchaca Pesca Sur S.A. will provide the auditors with evidence they have asked the National Fishing Service for regulation on the implementation of cameras to log images or other control system.</p> <p><u>In the second and third audit:</u></p> <p>The auditors will be provided documental evidence that work is being undertaken with the relevant authorities on the regulation that can indicate the required technical characteristics for logging images (cameras) or the increase of inspectors in the area.</p> <p><u>In the fourth audit:</u></p> <p>Camanchaca Pesca Sur will provide physical and documental evidence that image logging is implemented throughout the entire fleet, or if not, inspectors are used throughout.</p>

### 5.2.8 Condition 8 (All UoAs)

Performance Indicator	1.2.4
Score	70
Justification	<p><b>2<sup>nd</sup> SV Report:</b></p> <p><b>SG (a).</b> <i>“While this model is appropriate in principle, its application for these crustacean resources does not provide reliable evaluations of stock status in recent years or of predicted SB and F for the upcoming year (upon which to estimate acceptable biological catch (ABC)). As a result, the projected status may be found to be in error based on the model results of the following year. A consequence of this, is that management actions, including whether or not to implement the HCR could be unwarranted, as was the case for Red Squat Lobster South based on the 2017 assessment. Therefore, the assessment is not appropriate for the stock or (especially) for the HCR.</i></p> <p><b>SG (c).</b> <i>“There are many uncertainties with the fishery data and survey data that are not taken into account, including uncertainties associated with catchability of trawls used in the fishery and in the survey. There is also uncertainty regarding changes in trawl catchability over time and inconsistency in the application of assumptions regarding trawl catchability.”</i></p>
Condition	By 2023 the client should demonstrate that the reliability of the assessment has been improved such that it can be considered appropriate for the stock and for the harvest



	<p>control rule, through accounting for uncertainties in the current model and/or an alternative approach. SG80 should be met at this stage.</p> <p><i>NOTE: Deadline for closing the condition has been modified in accordance with the 6-month MSC Covid-19 derogation</i></p>
Condition start	February 2019
Condition deadline	<p>August 2023 (due to the 6-month MSC Derogation from February 2023 to August 2023).</p> <p><i>NOTE: Deadline set at 2SA (2019) was February 2023. At that stage, the team already considered that time required for relevant research to be undertaken may take longer than the remaining certification period.</i></p>
Milestones	<p>The following elements can be verified during annual surveillance audit:</p> <p><b><u>Year 3 (2020):</u> By the third year the client shall provide the team evidence that a plan has been developed to review the current assessment approach (including external expertise) toward improving the current model or developing a more reliable alternative approach. No re-scoring expected at this stage</b></p> <p><u>Year 4 (2021):</u> By the fourth year the client shall provide evidence that the plan is being implemented. No re-scoring expected at this stage</p> <p><u>Year 5 (2022):</u> At the end of the certification period (February 2022) the client shall provide evidence that a plan to review the current assessment approach (including external expertise) toward improving the current model or developing a more reliable alternative approach is being implemented. No re-scoring expected at this stage</p> <p><u>Year 6:</u> By (February) 2023 the client should demonstrate that the reliability of the assessment has been improved such that it can be considered appropriate for the stock and for the harvest control rule, through accounting for uncertainties in the current model and/or an alternative approach. SG80 should be met at this stage.</p>
Revised milestones (3 <sup>rd</sup> Surv audit)	<p>Dates were again modified at the 4<sup>th</sup> SA to address the 6-month MSC derogation:</p> <p><b><u>Year 4 (March 2021):</u></b> By the fourth surveillance audit, the client shall provide evidence that the plan to review the current assessment approach with input from external experts toward providing a more reliable assessment approach that accounts for uncertainty in the current approach (S1c) and is appropriate for the stock and for the harvest control rule (S1a) has been developed. No re-scoring expected at this stage</p> <p><b><u>Year 5 (2021/2022):</u></b> During reassessment, the client shall provide evidence that the plan to review the current assessment approach with input from external experts toward providing a more reliable assessment approach that accounts for uncertainty in the current approach (S1c) and is appropriate for the stock and for the harvest control rule (S1a) has been implemented and the review has identified methods for developing an improved or alternative assessment approach that is expected to improve the assessment of stock status. No re-scoring expected at this stage.</p> <p><b><u>Year 6 (August 2023):</u></b> By the first surveillance audit of the second certificate cycle, the client should demonstrate that the reliability of the assessment has been improved such that it can be considered appropriate for the stock and for the harvest control rule, through accounting for uncertainties in the current approach and/or by developing an alternative approach. <b>SG80 should be met at this stage.</b></p>

<p>Consultation condition</p>	<p>on</p> <p><i>2<sup>nd</sup> SV Report “The Technical-Scientific Committee on Demersal Crustaceans (CCT-CD) is an active Advisory body of the Management Committee for Demersal Crustaceans (CM-CD). Several methodological recommendations to improve the assessment of demersal crustaceans were agreed during the 3rd meeting of the CCT in 2017. In December 2018 a 2-day workshop was organised by the CCT to follow-up progress made on those recommendations. The minutes of this workshop were handed to the team during the site visit (actually all minutes from CCT-CD and CM-CD meeting held during 2018 were handed to the team). Progress on all technical issues were reviewed and progress assessed for every stock. The issues raised by the team for scoring PI 1.2.4 below 80 are identified in this document are rated as ‘high priority’. The track record indicates that the on-going activities of the CCT-CD are already consistent with the achievement of this Condition. Further, it demonstrates that necessary progress to achieve conditions does not require any of the following: (i) extra investment of time or money of the CCT-CD or the CM-CD; (ii) changes to management arrangements or regulations; (iii) rearrangements of research priorities by the CCT-CD or the CM-CD. Therefore, despite the condition is relying upon the involvement, funding and resources of the CM-CD and SUBPESCA, the CAB considers it achievable by the client and realistic in the period specified.</i></p> <p><i>Further, the client has presented evidence that an initial meeting to discuss these issues was held in May 30, 2019, with SUBPESCA and IFOP representatives. The list of participants can be consulted in Appendix 4, together with a letter from SUBPESCA acknowledging the condition raised to the certified fisheries and their commitment to discuss the adequacy of current stock assessment models in the forthcoming meetings of the CCT-CD.”</i></p>
<p>Progress Condition (3SA)</p>	<p>on</p> <p>The audit team appreciates the ongoing efforts to improve the current model and feels that initiatives such as increasing the model weighting on the survey series and exploring a more reliable approach to modelling the size frequency data could provide improvement. However, concern remains that the model does not consistently fit the survey series without systematic bias, presently underestimating recent survey swept-area biomass estimates for red squat lobster and failing to adjust to the recent change in biomass trajectory for yellow squat lobster. It is possible that these issues may not be resolved by efforts to improve the model if they are related to high year-to-year variability in trawl catchability. The recent initiative to assign different survey trawl catchability values to two distinct time periods was an arbitrary effort to improve the model fit but it did not address the uncertainty due to annual changes in catchability.</p>
<p>Progress Condition (4SA)</p>	<p>on</p> <p>The progress made in this condition meets the requirement of the revised milestone for the 4<sup>th</sup> surveillance audit. At the July 20 meeting of CCT-CD (Acta No 4 2020) it was agreed to conduct a remote peer review including external expert participation. It was noted that inclusion of external expertise would require securing appropriate funding. At the Nov.12 2020 meeting of CCT-CD (Acta No 6) severe problems were identified with the nylon shrimp assessment such that the assessment was not considered informative and it was noted that a review of the evaluation procedure was urgently requited. It was noted that this would be addressed in the first meeting of CCT-CD in 2021.</p> <p>A letter from IFOP detailed the work plan to be addressed in three sessions of the CCT-CD toward reviewing and improving the assessment process during 2021 (IFOP/DIR/2021/ N°247). This included a commitment, during the July 2021 meeting, to the preparation of the peer review process, with the identification of the leader and the experts who will participate in the review.</p>

Status	<p>Based on the above-noted developments the audit team concludes that a plan has been proposed during 2021 with the aim of improving the current model or developing a more reliable alternative approach. As a result, the status of this condition is <b>“ON TARGET”</b>.</p>
Additional information	<p><b>The client action plan prepared by the client was:</b></p> <p>The action plan to be followed by our company contemplates obtaining commitments from public entities related to certified stocks. This process has already begun with a meeting held on Thursday, May 30, 2019, with representatives of SUBPESCA and IFOP (see Appendix 4). The detail on the commitments to be obtained from the different stakeholders are detailed below:</p> <p><b>1.- Obtaining SUBPESCA commitment in the following:</b></p> <p>1.1. Analysis and review of the stock assessment models of certified stocks</p> <p>1.2. Integration of scientific advisors from the companies to interact with those of IFOP.</p> <p>1.3. Programming of scientific-technical seminars to share the state of the crustacean biomass and the assessment models used.</p> <p><b>2.- Obtaining IFOP commitment in the following:</b></p> <p>2.1. Interaction with scientific groups to review the results of stock assessments.</p> <p>2.2. Participation in seminars and scientific meetings related to certified stocks.</p> <p><b>3.- Commitment of Camanchaca Pesca Sur S.A.</b></p> <p>3.1. Keep performing fishery monitoring and assessment studies on annual basis with scientific support.</p> <p>3.2. Share information obtained with other scientific-technical stakeholders.</p> <p>3.3. Assistance of scientific advisers to the Scientific Committee for Demersal Crustaceans, CCT-CD.</p> <p>In order to achieve it, during 2019 the client will hold meetings with the relevant institution (IFOP, UCN, UCV, UCC, INPESCA) to consider the issue of improving the current model or developing a more reliable alternative approach. The scientists in each of the Institutions will be requested to comment on the finding of the audit, the potential to improve or replace the current model and the related actions and time scale.</p> <p>This will include consideration of the need for external peer review.</p> <p>Subsequently, the client would request that the issue be included in the agenda of a meeting of the CCT-CD.</p> <p>Subsequent actions would be dependent on the finding and recommendations of that meeting.</p> <p>The minutes of the various meetings would provide evidence that a plan has been developed to review the current assessment approach (including external expertise) toward improving the current model or developing a more reliable alternative approach.</p> <p>At the fourth annual surveillance audit we will report on any actions that have taken place in 2020 that indicate progress made in reviewing the current model used and modifying them as required. We will report on any involvement of international experts.</p> <p>It is anticipated that the recertification process that will start at the same time as the fourth annual surveillance audit will consider scoring of 1.2.4 and we will respond as required.</p>

## 5.3 Client Action Plan

A common Client Action Plan to address conditions 2 and 8 was updated by the client:

Action Plan updated  
for Conditions 2 and  
8

The action plan to be followed by our company contemplates obtaining commitments from public entities related to certified stocks. Consequently, the client action plan update has been prepared taking into account the results of the latest meetings that we attended:

This process started with the Third meeting of the Science Technical Committee held on the 30 of June 2020. The session consisted of the Workshop on the Review of Data and Models of the Stock Assessment of Demersal Crustacean Fisheries, focusing on the progress of the recommendations made previously by the CCT-CD. The meeting was held on June 30, 2020 with representatives of SUBPESCA and IFOP.

In addition, on July 8, 2020, an extraordinary meeting was held by the Chair(s) of the Demersal Crustacean Management Committee together with the Scientific and Technical Committee of the same fishery.

The relevant milestones reached at both meetings have been included in the following action plan:

### **1.- Obtaining IFOP commitment in the following:**

1.1. Establishment of the working plan for 2020-2021.  
1.2. At the next meeting in October 2020, IFOP will present the consolidated document that includes the status and total annual catches (CBA) , taking into account a possible lack of fishing information during the current year due to the health contingency. In addition, it is proposed to analyze current and past information (retrospective) to project a scenario of the status of the stock (year 2020) and estimate the CBA based on projections of Recruitment and Fishing mortality (F).

1.3 Alternative modelling scenarios based on committee recommendations will be presented at the October 2020 committee meeting. In this meeting, some scenarios could be prioritized to analyse in greater depth in the data and models workshop next year (2021). This could allow a new model configuration to be adopted for the following year (2022).

1.4 Consider the separation into fishing units (FUs). Separate the information and carry out the analysis in the respective FUs instead of the areas currently assessed. Incorporate an alternative analysis of the stock assessment per FU

1.5 The Scientific and Technical Committee (CCT), with the support of the group assessing stock models belonging to the IFOP, commit to

- Review and analyse the Technical Terms of Reference (TTR) of the current models based on what was identified in the latest MSC fishery surveillance report; and
- Conduct an external peer review of the current models by October 2021.

### **2.- Obtaining SUBPESCA commitment in the following:**

2.1. Analysis and review of the stock assessment models of certified stocks

2.2. Integration of scientific advisors from the companies to interact with those of IFOP.

2.3. Programming of scientific-technical seminars to share the state of the crustacean biomass and the assessment models used.

1.4 Support all the commitments made by the IFOP mentioned in section 1.

### **3.- Commitment of Camanchaca Pesca Sur S.A.**

3.1. Keep performing fishery monitoring and assessment studies on annual basis with scientific support.

3.2. Share information obtained with other scientific-technical stakeholders.

		<p>3.3. Assistance of scientific advisers to the Scientific Committee for Demersal Crustaceans, CCT-CD.</p> <p>3.4 Camanchaca Pesca Sur has requested its scientific advisors belonging to the Department of Oceanography of the Faculty of Natural Sciences and Oceanography of the University of Concepción, to provide with the technical results of their assessments, so that if required, they could be included in the technical terms of reference for the assessment of the performance of the current and/or a new model of stock assessment and management procedure in the Red and Yellow Squat lobster fisheries.</p>
Consultation condition	on	<p>Consultation on condition has not been necessary as the following information has been provided by the client:</p> <p>Minutes of the third Scientific and Technical Committee (CCT-CD) meeting held on 30 June 2020. The session consisted of the Workshop on the Review of Data and Models of the Stock Assessment of Demersal Crustacean Fisheries, focusing on the progress of the recommendations made previously by the CCT-CD. At that meeting, an analysis methodology was proposed, aimed at facing a possible lack of fishing information during the current year due to the health contingency. In addition, it is proposed to analyze current and past information (retrospective) to forecast a scenario of the stock condition (year 2020) and to estimate the TAC based on Fishing Recruitment and Mortality (F) projections.</p> <p>On July 8, 2020, a new meeting was held by the Chairperson (s) of the Demersal Crustacean Management Committee together with the Scientific-Technical Committee (CCT) of the same fishery. In the proposed agenda, the issue of the remarks raised by Bureau Veritas in the last MSC certification surveillance audit was analysed after been requested by Aurora Guerrero Correa, the coordinator of the Crustacean Fisheries Units from IFOP. This issue was raised by the users of the fishery in regions III-IV and V-VIII.</p> <p>In particular, the CCT is in favour of the revision of the model by the evaluation group of the IFOP model, as indicated by its President, Mr. Cristian Canales.</p> <p>The type and scope of such Audit for the current Model was indicated by the Head of Evaluation Area, Mr. Juan Carlos Quiroz, who indicated that after reviewing and analysing the Technical Terms of Reference (TTR) they are in a position to carry out a "PEER REVIEW", as done in other fisheries. The option of this assessment to be carried out remotely, is feasible and considered valid, according to the members of the Scientific Committee and the Undersecretariat for Fisheries. Therefore, it is a commitment to carry out the peer review of the assessment. The funding method to support external scientists has been brought to the SSPP for its evaluation and it is expected for October 2021.</p>

## 5.4 Re-scoring Performance Indicators

The re-scoring table on PI 3.2.3 is presented below. New text added to the original rationales is in **blue font**, while paragraphs removed from the original rationale are crossed-out.

### 5.4.1 Re-scoring Table for PI 3.2.3 – Compliance and enforcement

PI 3.2.3	<b>Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.</b>		
Scoring Issue	SG 60	SG 80	SG 100



a	Guide Post	Monitoring, control and surveillance <b>mechanisms</b> exist, and are implemented in the fishery and there is a reasonable expectation that they are effective	A monitoring, control and surveillance <b>system</b> has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A <b>comprehensive</b> monitoring, control and surveillance system has been implemented in the fishery and has demonstrated <sup>(SEP)</sup> a consistent ability to enforce relevant management measures, strategies and/or rules.
	Met?	Y	<b>N Y</b>	N
	Justification	<p>The LGPA establishes a range of tools for the auditing authority to carry out exhaustive monitoring, control, and surveillance of the fisheries.</p> <p>The following tools are currently required of fishing rights owners and vessel owners which participate in the yellow squat lobster and red squat lobster fishery of the V to VIII region:</p> <ul style="list-style-type: none"> <li>• A Satellite Positioning Device: from August 2000, all industrial vessels have to have an operational positioning system from the moment the vessel is authorised to set sail until puts into the authorised port. The system's signal is automatically received at two auditing institutions, the General Directorate of Maritime Territory and the SERNAPESCA.</li> <li>• A landing certificate: since 2002, all industrial vessels are required to have landing catches certified by a SERNAPESCA-accredited auditing body. <b>From mid-2019, landing certification will be carried out directly by SERNAPESCA staff, in accordance with the provisions of Law 21,132.</b></li> <li>• Scientific Observer: since 2002, there has been an established obligation to accept SUBPESCA-assigned scientific observers on board industrial vessels, During the final days of each month, SUBPESCA sends out a resolution with the vessels that must accept a scientific observer on board for the following month. The designated vessels must not set sail without the observer on board.</li> <li>• Cameras to record images on board vessels: since the end of 2012, the law established the requirement for industrial vessels to install and maintain and image recording device operational in order to detect and record discard actions in particular. <b>This requirement is in force for the entire industrial fishing fleet as from 1 January 2020.</b> <del>This requirement has not yet been implemented by the authority, which is still working on deciding the technical requirements of the cameras, as well as what location and number of cameras per fishery and size of the vessel to request.</del></li> </ul> <p>Electronic logbook: all industrial vessels must report the estimated catches of each resource after each fish haul to the SERNAPESCA. <del>In the near future, the Service should establish the acceptable margin of difference between the reported catches and the certified landings. All the differences compared to the criteria set by the Service will be attributed to the special fishing permit owner's quota.</del> <b>This requirement is regulated in Decree 129 of 2013 of the Ministry of Economy and Resolution No. 267 of 2020 of the National Fisheries Service.</b></p> <p>The current mechanisms for the monitoring, control, and surveillance of extraction operations of the analysed red squat lobster and yellow squat lobster fisheries allow the authority:</p> <ul style="list-style-type: none"> <li>• to be aware and certain of the operations taking place in the authorised areas.</li> <li>• to know the reported landings match the real landings in terms of species and sizes,</li> <li>• to know that reliable information on the activity can be collected when they operate with scientific observers.</li> <li>• <b>Control the development of the activities on board of the vessels to control the unauthorised discarding, as well as the release of the individuals to be returned</b></li> </ul>		



	<p>to the sea, according to the regulation established for this purpose annually in accordance with the provisions of articles 7ºA and following of the LGPA.</p> <p>It is worth pointing out that the previously indicated demands apply to all the boats involved in the yellow squat lobster and red squat lobster fishery in the V to VIII region. <del>It only remains for the on-board camera requisite to become compulsory to ensure the catches match what is unloaded, and as such, account for the unauthorised discarding</del></p> <p>There is also another control mechanism, specifically regarding the unload volumes and the type of hydrobiology resources unloaded, using mandatory transport records, which are required when transferring the unloaded catches. On the other hand, processing plants are obliged to provide data on stocks in their plants, indicating the source of each hydrobiology resource they process, as well as what is produced from them.</p> <p>All the catches, landings, storage, and marketing of hydrobiology resources should have a legal source, which should have SERNAPESCA accreditation in accordance with the provisions of SERNAPESCA Resolution <del>No. 1319 of 2014</del> <b>Nº 1340 of 2020.</b></p> <p><del>Considering the on-board camera recording is still to be implemented and that there aren't any inspectors on board boats to provide data on the activities taking place on board, particularly relating to the accountability of the discards, the fishery achieves SG 60, and does not meet either SG80 or SG100.</del></p> <p><b>Consequently, it is concluded that a comprehensive MCS system applies to the demersal crustacean, yellow squat lobster and red squat lobster fishery, therefore SG 60, SG 80 and SG 100 are met..</b></p>			
b	Sanctions			
	<b>Guide post</b>	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, <b>are consistently applied</b> and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and <b>demonstrably</b> provide effective deterrence.
		Y	Y	N
	<b>Justification</b>	<p>The LGPA establishes administrative sanctions for the main non-compliances of the analysed red squat lobster and yellow squat lobster fisheries. The administrative sanctions were established in 2002 and have proven to be effective in ensuring compliance with the established regulations.</p> <p>The administrative sanctions currently typify the main non-compliances, establishing sanctions for the special fishing permit owner, along with the captain of the offending vessel.</p> <p>The following non-compliances are administratively sanctioned:</p> <ul style="list-style-type: none"><li>• Exceeding the allocated quota.</li><li>• Not reporting catches when unloading.</li><li>• Not complying with the certification procedure.</li><li>• Catching from an unregistered vessel.</li><li>• Discarding when against regulations.</li><li>• Undertaking extraction activities in small-scale reserve areas.</li><li>• Catching from a different fisheries unit to the allocated unit.</li></ul> <p>The sanctions are monetary fines and a reduction by the excess tonnage from the</p>		

		<p>following year's quota. In the event of more than two sanctions in two consecutive years, an additional sanction of suspension of the activity for 6 months will apply.</p> <p>All non-compliances due to other causes correspond to the sanctioned party in accordance with the legal procedure.</p> <p>In accordance with the information published in the SERNAPESCA website, 2 sanctions for yellow squat lobster are recorded for 2014 and 2015, defined in accordance with article 116 of the LGPA, which sets the sanctions for non-compliances that don't have a specific sanction in law, processed in March 2014 and sanctioned by the Law Courts in March 2015.</p> <p>When consulted about the application of administrative sanctions, SUBPESCA, via Letter (G.S.) No. 102 of January 2015, informs that between 2000 and 2014, 2 administrative sanctions were found, both for exceeding the allocated quota, with the non-compliances occurring in 2008, which were then sanctioned in 2010. The above proves that sanctions were applied to non-compliances, meeting SG60.</p> <p>Sanctions defined for non-compliances are applied in line with the damage caused, as monetary fines and discounts on the allocated quota. For example, in the case of exceeding the allocated quota, the sanction is three times the value of the excessive catch as a monetary fine, as well as discounting the amount exceeded from the following year, Article 40 B of the LGPA. In the case of discards, a 1,000 UTM fine is sanctioned for all events (approximately US\$70,350) and 3 times the value of the tonnes discarded during the infraction, Art. 40 C of the LGPA. As a result of the above, the sanctions are conceived to cause a deterrent effect and are consistently applied, SG80 is met.</p> <p>Considering that the sanction Procedures, particularly those administrative in nature, applicable to the more serious non-compliances with respect to sustainability, are relatively new since 2013, and that there are different instances that take time to apply, more time is needed to demonstrably provide effective deterrence meaning SG100 is not achieved.</p>		
c	Compliance			
	<b>Guide post</b>	Fishers are <b>generally thought</b> to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	<b>Some evidence exists</b> to demonstrate comply with management under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a <b>high degree of confidence</b> that fishers comply with the management systems under assessment including, providing information of importance to the effective management of the fishery.
	<b>Met??</b>	Y	Y	N
	<b>Justification</b>	According to SERNAPESCA data, there isn't any evidence of systematic non-compliances for these fisheries, which agrees with the sanctions data.		

	<p>Discarding is assumed to be one of the main non-compliance issues, although there isn't any reliable data on it and when it has been detected, the respective sanctions were applied from April 2013 onwards with the initiation of the discard research fishing, which is legal for the boats taking part in it.</p> <p>In line with the above, the yellow squat lobster and red squat lobster special permit holders have been participating in the discard research program since mid-2013, which aims to collect data on the fishing operation, quantify the discard, and establish the causes.</p> <p>With that data, it should be possible to establish a discard reduction plan that takes the administration measures and technological means to reduce discarding into account. It is worth mentioning that the legally established sanctions do not apply to the programme participants during the research programme.</p> <p>It is worth nothing that of the 14 boats undertaking extraction activities during 2014, 13 of them took part in the discards research programme, which in total unloaded 99.1% of yellow squat lobster and 98.2% red squat lobster in 2014. During 2016 up to 31st May, 10 boats have been involved in extraction activities, all of which are included on the discards research programme.</p> <p>One of the aspects deriving from this research programme is the willingness of Special Permit holders to cooperate with collecting data and continue modifying the drag nets in order to make them even more selective in terms of catching better sized target species and reducing the catches of other species as by catch, and common hake in particular.</p> <p>In accordance with the SERNAPESCA Auditing Activities report, available through the entity's website, in the reports undertaken to support Fishing and Aquaculture in 2012, 2013, and 2014, none of the analysed resources were identified among the main species seized due to legal infractions, and the total catches were not exceeded, meaning in general terms it can be said that the fishermen comply with the fishery management currently being evaluated. Examining the last three reports published by SERNAPESCA, which included only 2 administrative sanctions for exceeding the quota for 2008 between 2010 and 2014, and two sanctions set by the Law Courts between 2014 and 2015 for what were considered minor non- compliances, it can be stated that there is some documented proof to show that the fishermen comply with the fishery management system being evaluated, meaning SG60 and SG80 are met.</p> <p>All the same, there isn't a high level of confidence in the fishermen complying with the established management system in this fishery, given that as the on board cameras are not operational and there aren't any on board inspectors, boats undertaking extraction activities without an observer on board could be discarding and not reporting it in their log, which is a non-compliance. Based on the above, SG100 is not met.</p>		
d	Systematic non-compliance		
	Guide post		There is no evidence of systematic non-compliance.

	<b>Met??</b>		Y	
	<b>Justification</b>	<p>There wasn't any non-official data on recurring non-compliances from the banning of discards in the yellow squat lobster and red squat lobster fishery being analysed prior to 2012, which was also the case for other major Chilean fisheries.</p> <p>As result of the above, a legal project was presented in January 2005, with the aim of introducing Paragraph 1 bis "On the discard of hydrobiological species" from the first title of the LGPA, with the aim of studying the reasons behind discarding using a research programme and then to establish a Discards Reduction Plan. In order to ensure compliance of the above, the requisite for boats over 15 metres in length to have a working camera during the entire fishing trip was established. This legal project ended up being passed through Parliament in September 2012, law 20,625.</p> <p>The yellow squat lobster and red squat lobster fishery being evaluated started a discards research programme in April 2013, being the first fishery to do so, which was ratified by the SUBPESCA Resolution No. 882, dated 3rd April 2013.</p> <p>All boats forming part of the fisheries being evaluated are over 15 metres in length.</p> <p>Considering discards were the main non-compliance issue, 13 out of 14 boats that operated in 2015 and 10 that have operated to date in 2016 are included on the discards research programme and therefore, informing that within the required terms does not constitute a non-compliance.</p> <p>In accordance with data from the SERNAPESCA in their reports on compliance during years 2013, 2014, and 2015, available through their website, there isn't any evidence of systematic non-compliances among these fisheries, which is in line with the sanctions applied. SG 80 is therefore met.</p>		
	<b>References</b>	DS No. 430 from MINECON, which corresponds to the LGPA text: Ley 20.625; Ley 21.132; Resoluciones N° 267 de 2020 y N° 1.340 de 2020 del Servicio Nacional de Pesca.		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>75 90</b>
				<b>C7 NA</b>

## 6 References

Every SERNAPESCA regulation is listed and available in the institution's website, <http://www.sernapesca.cl/>. Similarly, every regulation established by SUBPESCA is available from their website, <http://www.subpesca.cl>. Furthermore, every IFOP technical report deriving from their research is available in the institution's website <http://www.ifop.cl>.

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## 7 Appendices

### 7.1 Evaluation processes and techniques

#### 7.1.1 Site visits

The remote visit was scheduled in June 2021, together with the visit for the other overlapping fishery (Chile modified demersal trawl fishery).

The remote calls organized as part of the surveillance audit were carried out between the 8<sup>th</sup> and the 18<sup>th</sup> of June 2021. All meetings were organised as video calls. **Table 7.1.1** shows all meetings held.

The agenda of the site visit, including people met and main topics discussed are presented in **Table 7.2.1**.

During the visit the team focused in checking any update affecting the fishery and assessing progress on the conditions established in the PCR. Information collected updates affecting the fishery is summarized in **section 4.2** of the current report, while the assessment made on the progress towards closing the conditions is presented in tables under **section 4**. In the case, new information collected justifies re-scoring any particular PI, re-scoring tables are presented in **section 5.4**.

**Table 7.1.1.** Details of the remote meetings held as part of the 4th surveillance audits for the two overlapping fisheries of demersal crustaceans in Chile.

Date	Venue	Time (CEST)	Institution	Attendees
June 8	Video call	15:00-16:00	SUBPESCA	Aurora Guerrero, Guisella Muñoz, Luis Cocas, Mauro Urbina
	Video call	16:30-17:30	SERNAPECA	Fernando Naranjo, Rubén Toro, Feliz Morales
June 10	Video call	15:00-16:30	CAMANCHACA + Universidad de Concepción (UdC)	Lilian Martinez, Jorge Revillot, Pablo Aravena, Luis Cubillos (UdC)
	Video call	17:30-19:50	AIP + Universidad Católica del Norte (UCN)	Leandro Sturla, Hector Tellez, Denise Bore, Mario Venegas, Claudio Velasquez (Bracpesca, S.A.), Andres Quintanilla (Pesquera Quintero), Williams, Enzo Acuña (UCN)

June 16	Video call	15:00-16:15	UdC, UCN	Luis Cubillos, Enzo Acuña
June 18	Video call	15:00-17:00	IFOP	Sergio Lillo, Victoria Escobar, Alejandro Yañez, Mauricio Ibarra, Diana Parraga, Maximiliano Zilleruelo, Claudio Bernal, Carlos Montenegro

### 7.1.2 Stakeholder participation

The site visit for the surveillance audit was announced at the MSC website on the May 7, 2021 and stakeholders had 30-days to send their contributions. In addition to the announcement of the site visit published at the MSC website, 84 different stakeholders were contacted via e-mail (including SUBPESCA, SERNAPESCA, IFOP, Armada de Chile, ASIPEs, INPESCA, PUCV, UDEC, UCN, CONAPACH, CONFEPACH, and NGOs –WWF, CEDEPESCA, Oceana, Greenpeace, ISF, etc.).

Further, the team with the assistance of the client elaborated a list of key stakeholders to be interviewed and were contacted via email and telephone in order to ensure their participation and arrange the meetings. The list of institutions and people finally interviewed during the site visit is detailed above in **Table 7.1.1**.

### 7.2 Stakeholder input

The stakeholder input was restricted to the information collected during the meetings held at the site visit and the documents sent by the stakeholders as a result of the requests made by the team during those meetings. In this particular case, most of the relevant documents (regulations, IFOP reports, minutes of the CCTCD and the CMCD) are shared with the team (under request) prior to the site visit.

**Table 7.2.1** presents the main topics discussed with the different stakeholders during the different meetings. All relevant information collected on updates or modifications affecting the fishery is summarized in **sections 4.2 and 5** of the current report, while harmonisation activities with overlapping fisheries are presented in **Appendix 7.4**. All documents used for the assessment are listed in **Section 6** (References).

No other stakeholder inputs were received by email using the template provided by MSC.

**Table 7.2.1.** Details of the main topics discussed during the remote visit carried out as part of the current surveillance audit

Stakeholder	Topics discussed
<b>SUBPESCA</b>	<ul style="list-style-type: none"> <li>- Review of the latest reports available (seguimiento de la pesquería, descartes, stock status...)</li> <li>- Review of current status of the target stocks, in particular the Nylon Shrimp</li> <li>- Discussion on how the HCR established in the MPDC (recovery plan) was implemented for the nylon shrimp for 2021.</li> <li>- Update on the implementation of the Electronic Monitoring System (EMS) on board the industrial fishing fleets operating in Chilean waters</li> <li>- Update on the implementation the conservation measures for reducing incidental mortality on seabirds</li> <li>- Update on the implementation of the new version of the electronic logbook (adapted to report discards).</li> <li>- Current review process of the MPDC</li> <li>- Update on the reporting to NOAA in relation to the US Marine Mammal Protection Act</li> </ul>
<b>SERNAPESCA</b>	<ul style="list-style-type: none"> <li>- Update on the implementation of the Electronic Monitoring System (EMS) on board the industrial fishing fleets operating in Chilean waters.</li> <li>- Review of landing data of the assessed fleets</li> <li>- Update on the implementation of Law 21.132 affecting the role performed by SERNAPESCA</li> <li>- Updates on the functioning of the integral traceability system recently implemented</li> </ul>
<b>IFOP</b>	<ul style="list-style-type: none"> <li>- Update on actions taken to review the approach used to assess the different stocks of demersal crustaceans</li> <li>- Review of current status of the target stocks, in particular the Nylon Shrimp.</li> </ul>

	<ul style="list-style-type: none"> <li>- Discussion on the timing of the scientific advice and the input data for the stock assessments</li> <li>- Implementation of the tori-lines (scary lines) for birds</li> <li>- Results of the observers monitoring programme on discards, including incidental interactions with MSC non-target species (seabirds and marine mammals)</li> </ul>
<b>UdC and UCN</b>	<ul style="list-style-type: none"> <li>- Update on actions taken to review the approach used to assess the different stocks of demersal crustaceans</li> <li>- General overview and discussion on the population dynamics of the target species and the influence on how the direct surveys and stock assessments are performed.</li> <li>- Discussion about the direct surveys, the scientific advice and the input data for the stock assessments</li> <li>- Discussion on the role of the CCT-CD as a multi-stakeholder body which reviews the stock assessment and advice provided by IFOP.</li> </ul>
<b>CAMANCHACA</b>	<ul style="list-style-type: none"> <li>- Progress on the remaining conditions, in particular all issues related to the review on the approach of the stock assessments</li> <li>- Details about the implementation of the ESM</li> </ul>
<b>AIP</b>	<i>Not relevant for this report</i> <ul style="list-style-type: none"> <li>-</li> </ul>

### 7.3 Revised surveillance program

This is the fourth audit, and the fishery is entering re-assessment. The announcement of the recertification is expected to be published in September 2021, immediately after current surveillance audit. A surveillance program for the next certification cycle will be confirmed if the fishery is successfully recertified.

### 7.4 Harmonised fishery assessments

The other overlapping fishery (the Chile squat lobsters Camanchaca demersal trawl fishery) is assessed by the same CAB and assessment team. The same site visit was performed for assessing the two fisheries. The scores were harmonised during the initial assessments. Any change to the scores performed during the surveillance audits has been harmonised. The progress on common certificate conditions were harmonised at this surveillance report.