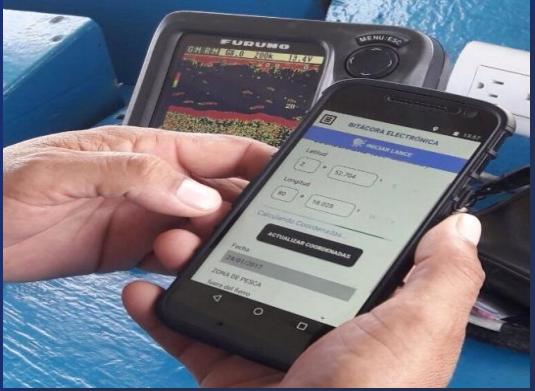


Chile's approach for the Implementation of EM to monitor and control discards, incidental bycatch and fishing regulation



Luis Cocos

Bycatch and Observer Programs Coordinator
Undersecretariat for Fisheries and Aquaculture
Government of Chile



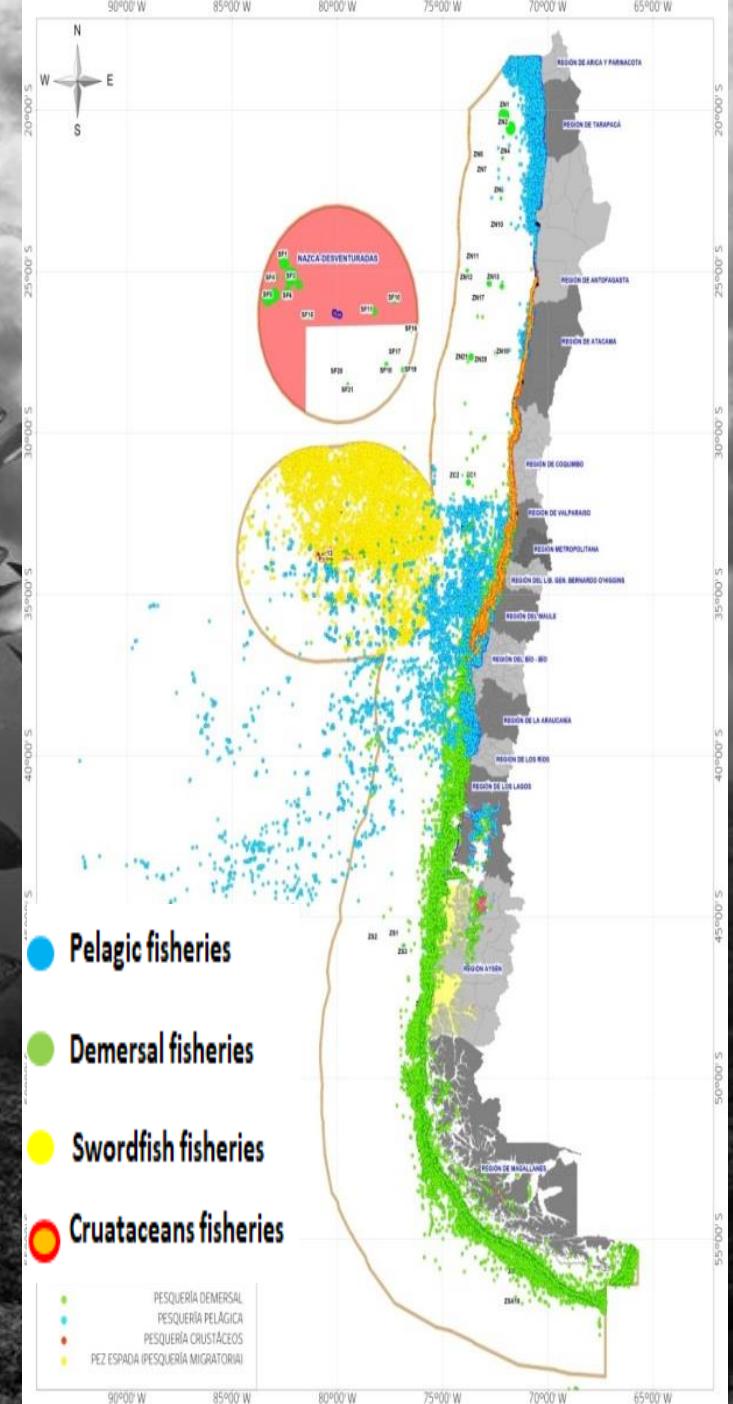
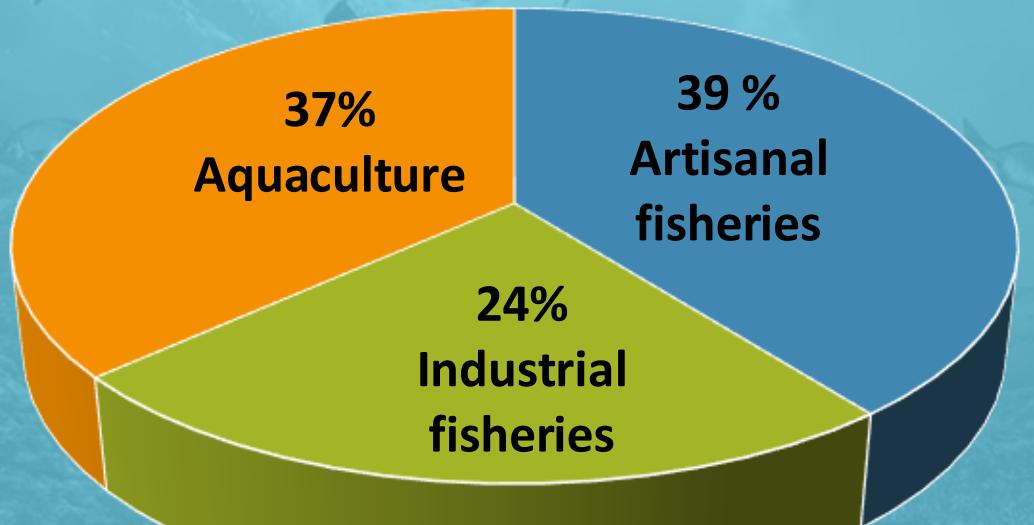
FISHERIES IN CHILE

3.7 million km² of EEZ (10th largest)

4400 km Seashore

10th country in the world in fishing landings

Landings in 2023
4,102,598 metric tons



~ 13000 Artisanal Vessels < 18 mt



~ 100 Industrial Vessels > 18m



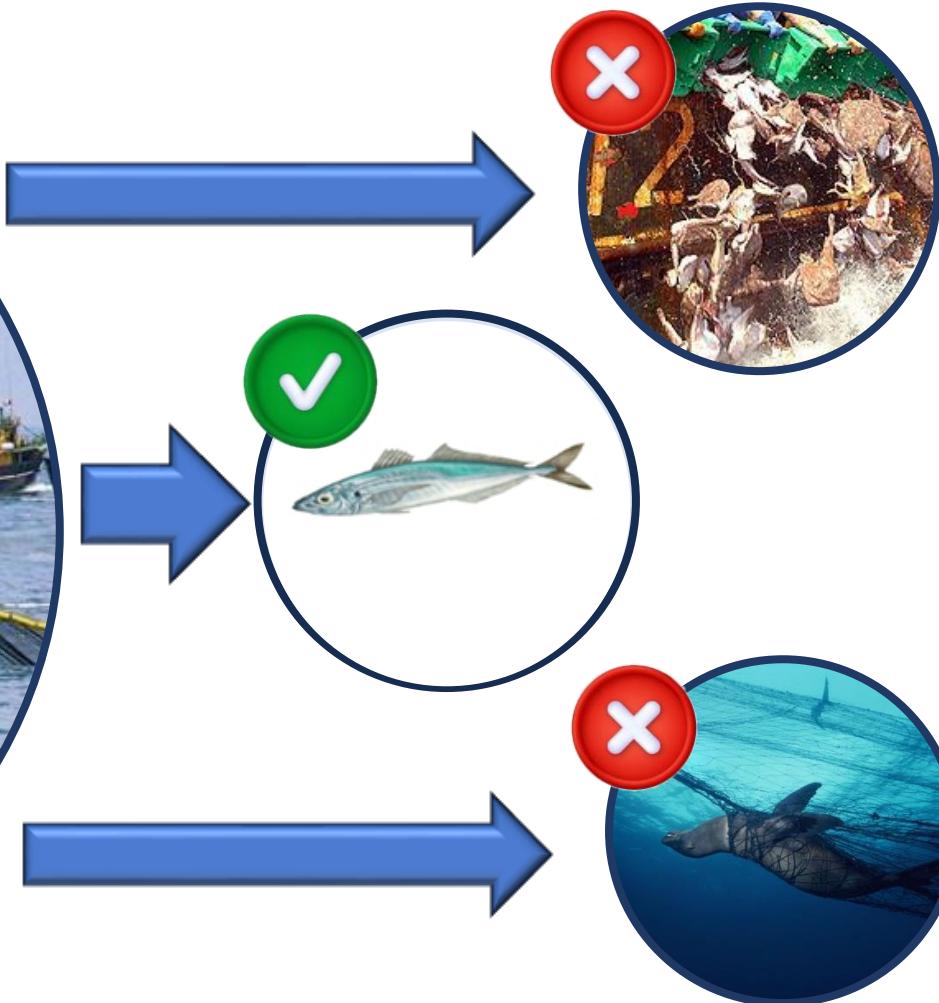
~400 Farming facilities



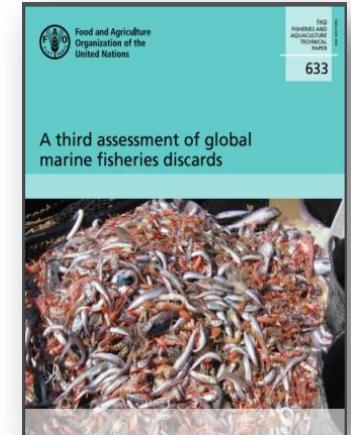
~ 140000 Direct jobs



What drove the evolution of fisheries monitoring programs?



FAO 2019



9.1 million tons discarded/year
1 million seabirds
8,5 million sea turtles
20 millions Sharks
650,000 marine mammals

In addition to target species, fishing can capture other non-target species that are discarded when they have no commercial value or are prohibited. Fishing can also interact with megafauna species that are injured or killed when caught in fishing gear.





Fisheries Law undergoes major amendments in 2012 and 2013

- ✓ **MAIN OBJECTIVES OF THE LAW:** Conservation, sustainable use of fishing resources and the implementation of the ecosystem approach and the precautionary principle
- ✓ **OBLIGATION** to assess and reduce discards and incidental catches of seabirds, marine mammals, and turtles during fishing operations
- ✓ **IMPROVEMENT** of fisheries' monitoring systems for both, science and compliance control.

ASSESS – REDUCE – MONITOR



Discards

Returning unwanted catch
to the sea



Non target catch

Impact on
marine biodiversity



Incidental bycatch

Seabirds, mammals and
turtles accidentally caught



A stepwise approach to addressing discards, incidental bycatch and its monitoring

2013

Diagnosis
programs



Observers onboard



Bycatch reports

Pesquería	Especie	Año	Muestreo aleatorio simple. Estimador de razón					
			Vivos		Muertos		Vivos	
Camarón nailon - Langostino - colorado - Langostino amarillo /artesanal II-VIII Regiones	Otaria byronia	2016	0	NC	-	NC	-	NC
		2017	0	NC	-	NC	-	NC
		2018	0	NC	0	NC	-	NC
		2019	0	NC	-	NC	-	0,98
Camarón nailon - Langostino - colorado - Langostino amarillo /industrial II-VIII Regiones	Otaria byronia	2020	0	NC	14	0,98	-	-
		2016	52	0,55	35	0,67	-	-
		2017	51	0,47	26	0,67	-	-
		2018	9	0,92	38	0,23	-	NC
		2019	51	0,33	19	0,53	-	-
		2020	29	0,55	-	-	-	-

2017

Reduction
measures

FLEXIBILITY IN BYCATCH DEDUCTION RULES

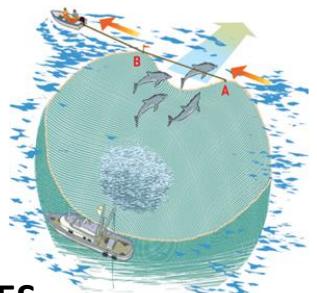
FISHING
TRANSSHIPMENTS



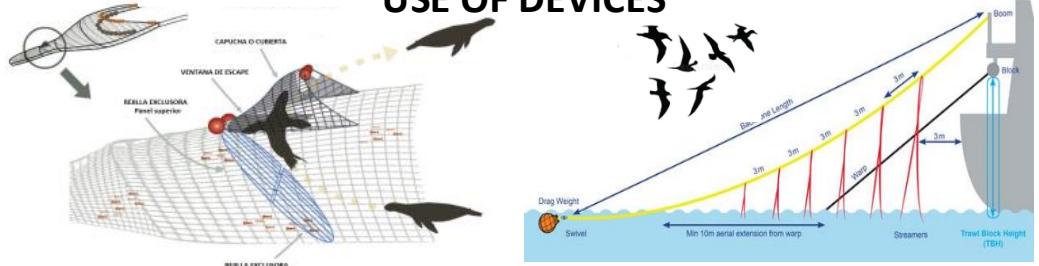
HANDLING
PROTOCOLS



RELEASE
MANEUVERS



USE OF DEVICES



2020

Compliance
control

EMS



Electronic Logbooks

CONTROL

+

SCIENCE



Observers programs

Non-Sanction stage

Sanctions apply

Monitoring by type of fleet

CONTROL

SCIENCE

Discards & bycatch

CAMERAS ONBOARD (EMS)

Record fishing information

ELECTRONIC LOGBOOKS

Fishing zone control

VESSEL POSITIONING (VMS)

Control TAC

LANDING CERTIFICATION

Compliance with measures

ON-SITE INSPECTION

Scientific monitoring

OBSERVERS

100% Industrial vessels



On board/landing

Artisanal > 15 m

As of 2024

Volunteer



On board/landing

Artisanal <15 m

Not required

Volunteer

Not required

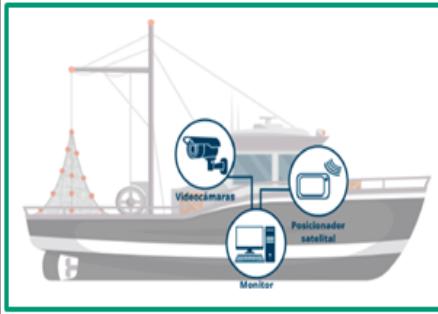


Only landing samplings

EMS FOR CONTROL & MONITORING

Cameras on-board

Deferred System to Detect Discard and Incidental Bycatch Actions



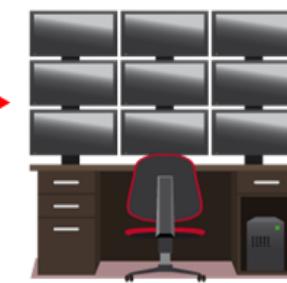
Recording and storage module

Implemented modules



Information collection module

Image analysis module in processing stations



Electronic Logbooks

ELECTRONIC LOGBOOK SYSTEM (SIBE) TO REPORT FISHING ACTIVITIES

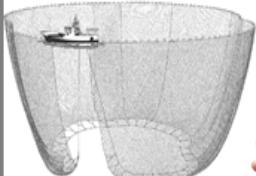
CAPTAIN RECORDS ESTIMATION OF CATCH, DISCARDS AND INCIDENTAL BYCATCH IN REAL TIME

AS SOON THERE IS INTERNET CONNECTION THE INFORMATION IS REMOVED

SERNAPESCA AND VESSEL OWNER ACCESS AND ANALYZE INFORMATION SENT



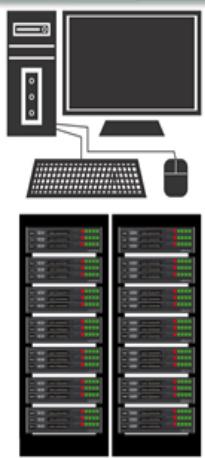
SIBE Mobile



INFORMATION IS RECORDED DURING FISHING OPERATION



INTERNET



SIBE Web

ADM SERVERS AND INFORMATION STORAGE

From 2020 Mandatory for 100% industrial fleets ~100 Vessels

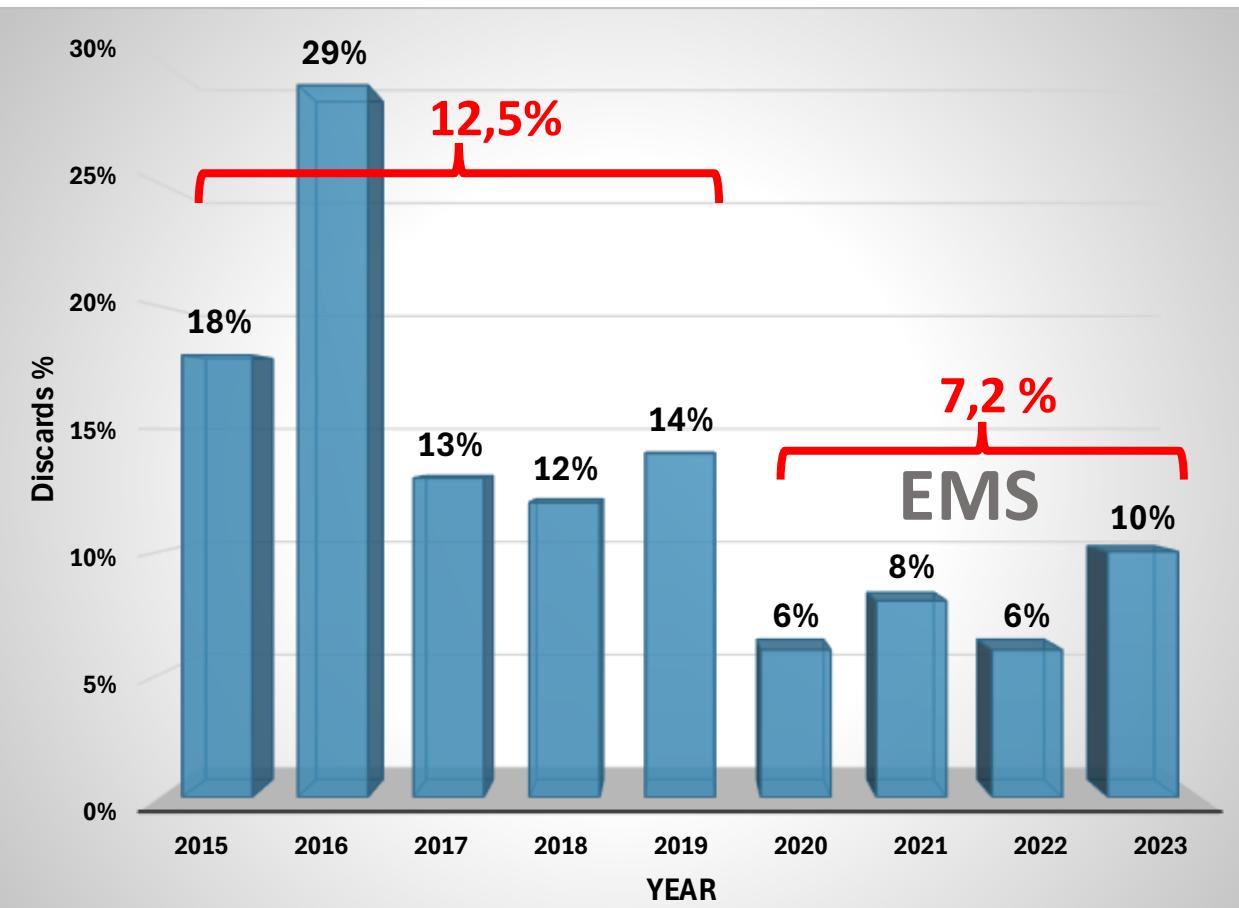
From 2026 Mandatory for artisanal fleets ($\geq 15m$) ~500 Vessels

From 2020 Mandatory for 100% industrial fleets ~ 100 Vessels

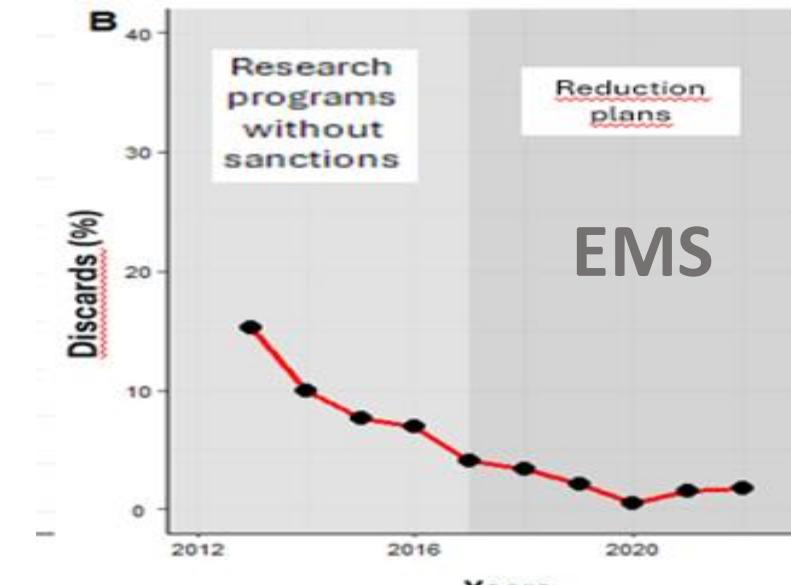
Voluntary use in artisanal fleets

SOME OUTSTANDING RESULTS

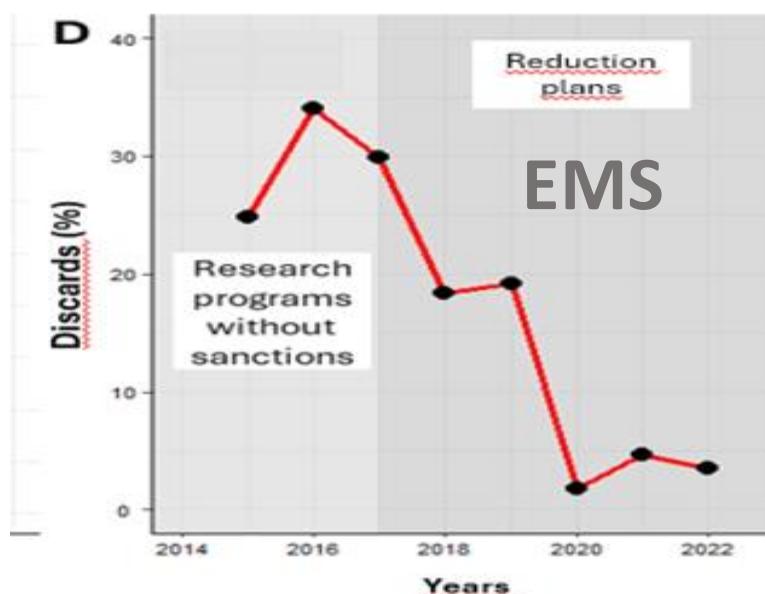
% Discards in all demersal fisheries combined



Discard levels in hake trawl fleets 2015-2022



Fleet \geq 1000 Hp



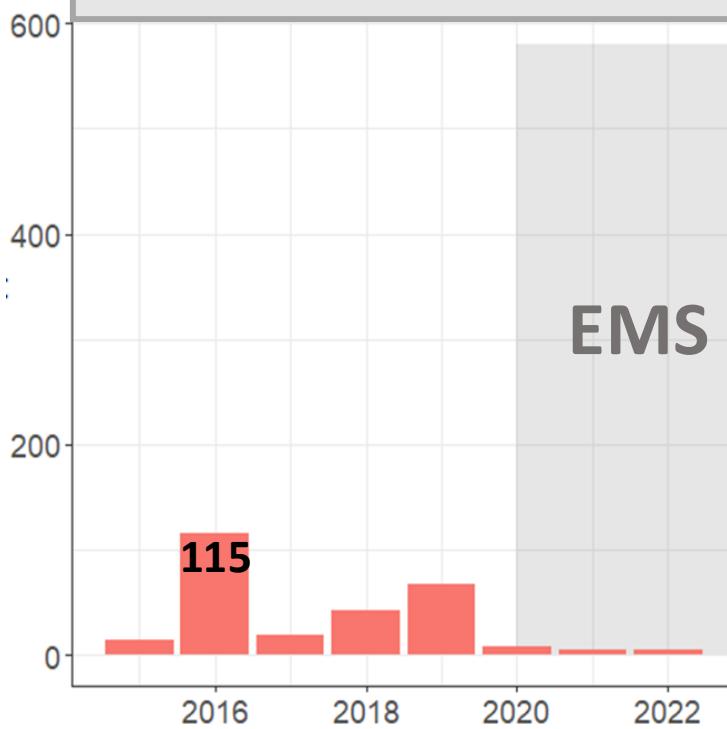
Fleet $<$ 1000 Hp



INCIDENTAL BYCATCH TOTAL MORTALITY ESTIMATES

SOUTH AMERICAN FUR SEAL

N° dead specimens



SOUTH AMERICAN SEA LION

EMS

580

450

410

520

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Importance of policies for EM implementation in Chile



Law provided clear regulatory framework with defined objectives and scope of EM, responsible agencies and timings.



Gradual process that included first, the diagnosis of the problem, then reduction measures to end with control and sanctions.



Review/update all impractical regulations that induce discards and bycatch before sanctioning



Formal spaces for debate and feedback with industry. Consider the views of the different stakeholders. Complement EM with the pre-existing monitoring programs.



Effective compliance control and sanctions but at the very end of the process.



Acknowledgment

To the Chilean agencies responsible for fisheries monitoring programs



Regulates and manages through policies and regulations



Provides scientific background for management decisions



Monitors compliance with fisheries regulation

Special thanks to TNC-Chile for supporting our work

