Purse Seine
Fishing Procedures & Gear

Introduction

- 30% global catch

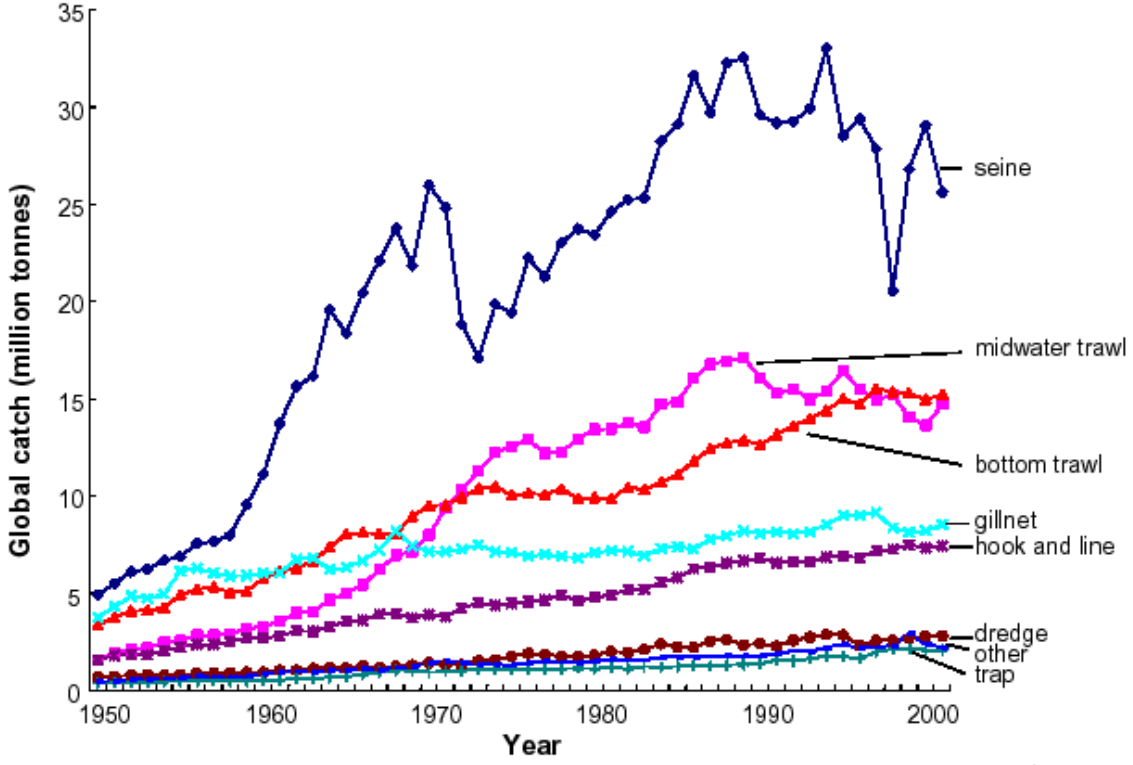
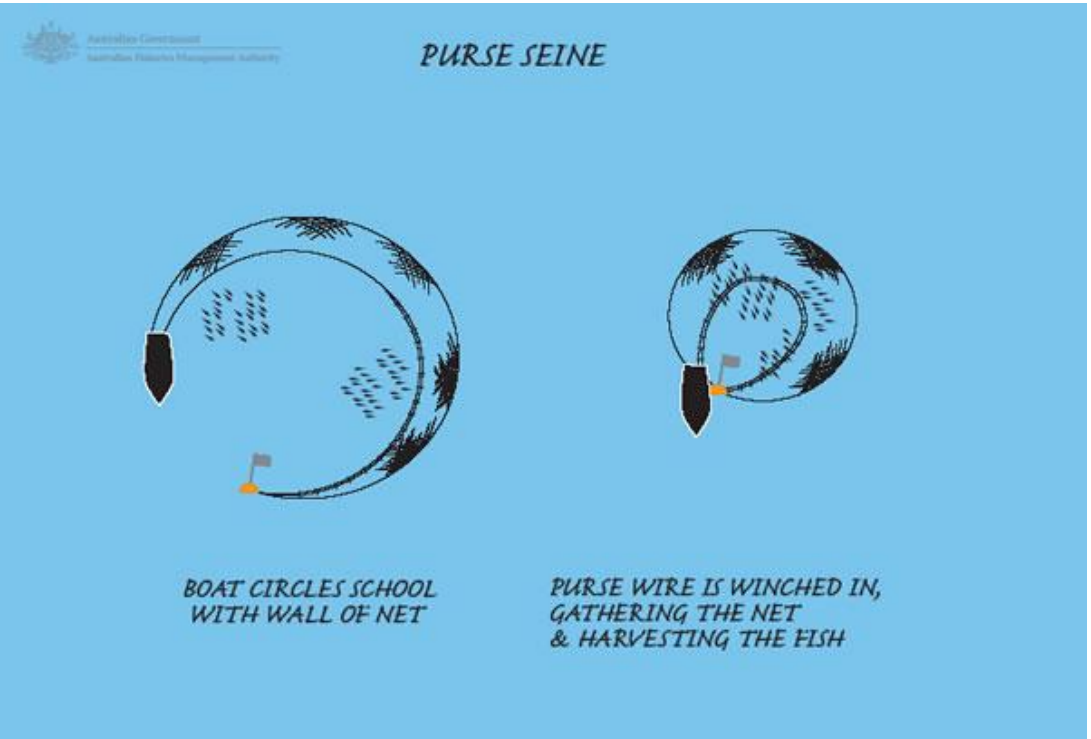


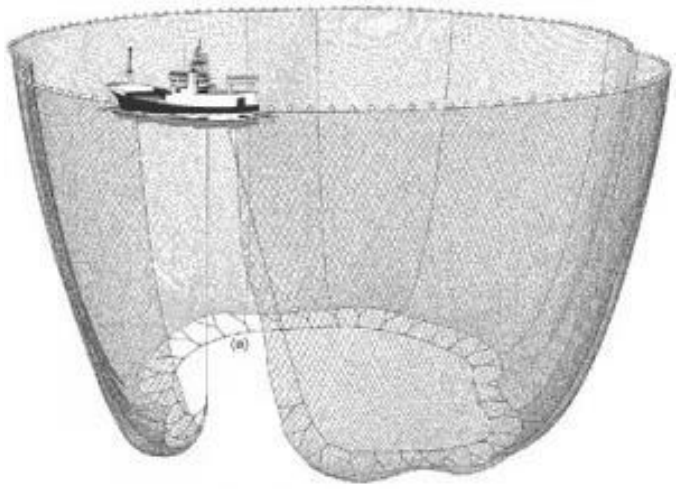
Figure 1. Annual global catch (million tonnes) taken by general fishing gear types

Watson et al. 2004

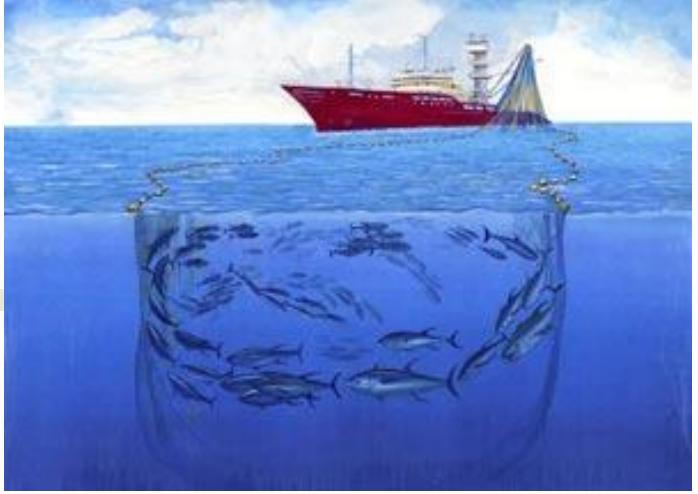
Introduction

- 30% global catch
- Wall of net encircles pelagic fish





Introduction



- 30% global catch
- Wall of net encircles fish
- Usually fish close to surface
- Inland, coastal & high-seas

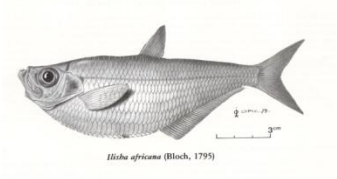

http://afishblog.com/

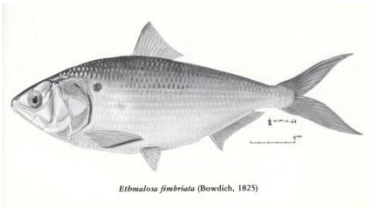

http://whyfiles.org

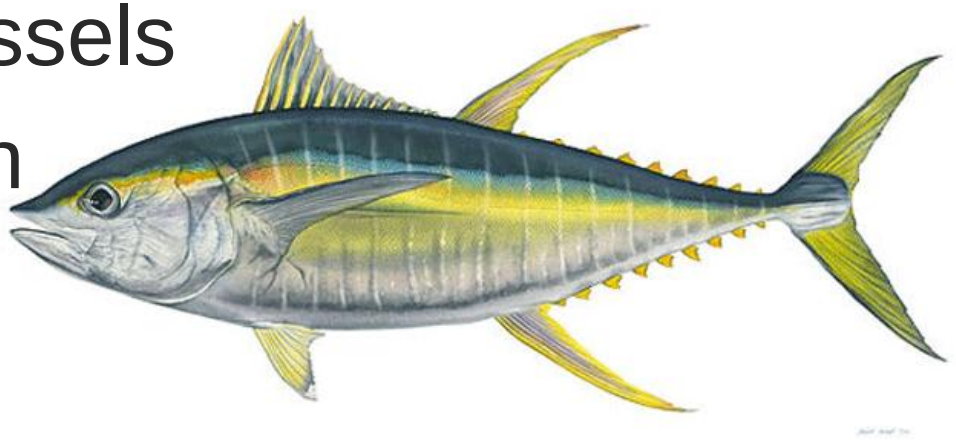

http://www.inpesca.com

Introduction

- 30% global catch
- Wall of net encircles fish
- Usually fish close to surface
- Inland, coastal & high-seas
- Small & large vessels
- Small & large fish







Introduction - impacts

- No bottom impact
- Bycatch – mammals, turtles, sharks
- Juvenile fish issues with FADs

Objectives

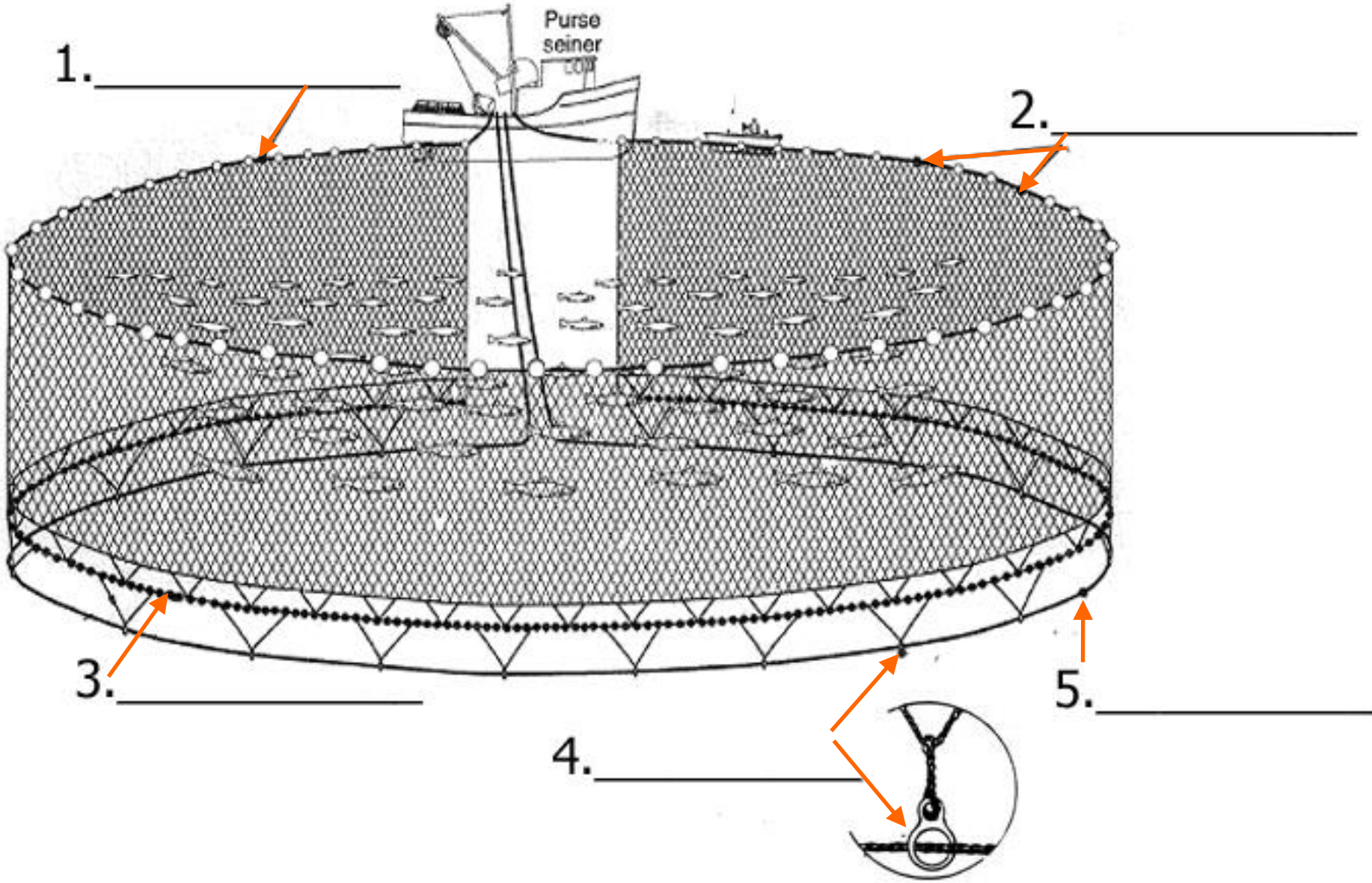
- Describe how purse seine gear works
- Explain how marine mammals can be released safely
- List 4 components of a purse seine and 2 pieces of specialized equipment
- Demonstrate ability to complete the gear description form

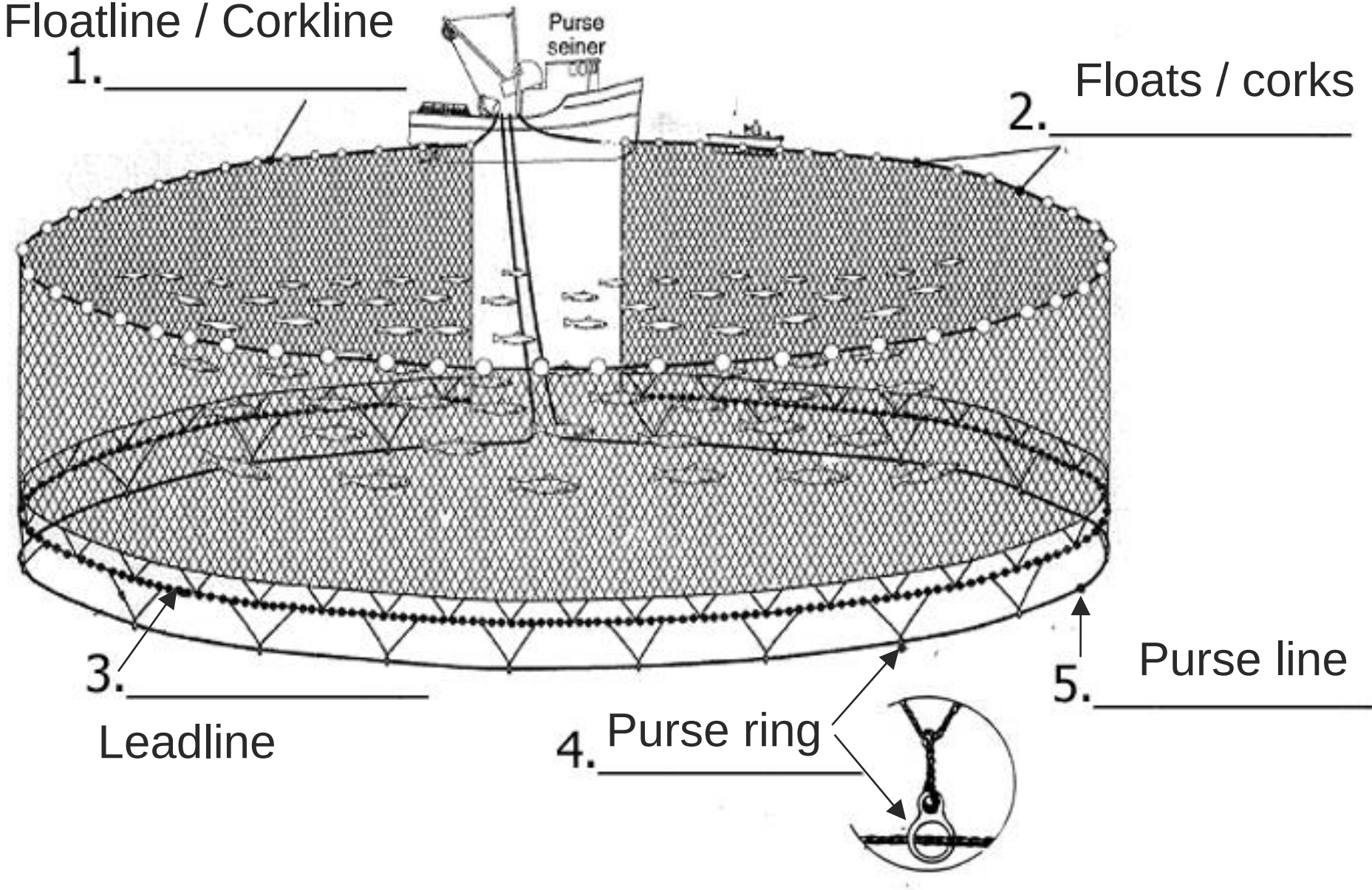
Sampling priorities

1. Record vessel activity continuously each day on board;
2. Estimate total catch for each gear deployment;
3. Collect random samples for catch composition of each set and document species retained and discarded;
4. Describe all floating objects sighted, especially those involved in a fishing set;
5. Subsample catch for lengths;
6. Record all sightings and interactions with marine mammals and sea turtles;
7. **Record fishing gear characteristics.**

Activity #1

- Grab a piece of scrap paper
- Complete as much of the following diagram as you can
- You have 3 minutes


Purse
seiner
1.
2.
3.
4.
5.


Floatline / Corkline
1.
Purse seiner
2.
Floats / corks
3.
Leadline
4.
Purse ring
5.
Purse line

Gear description – float line (cork line)

Gear description – lead line, purse line, purse rings

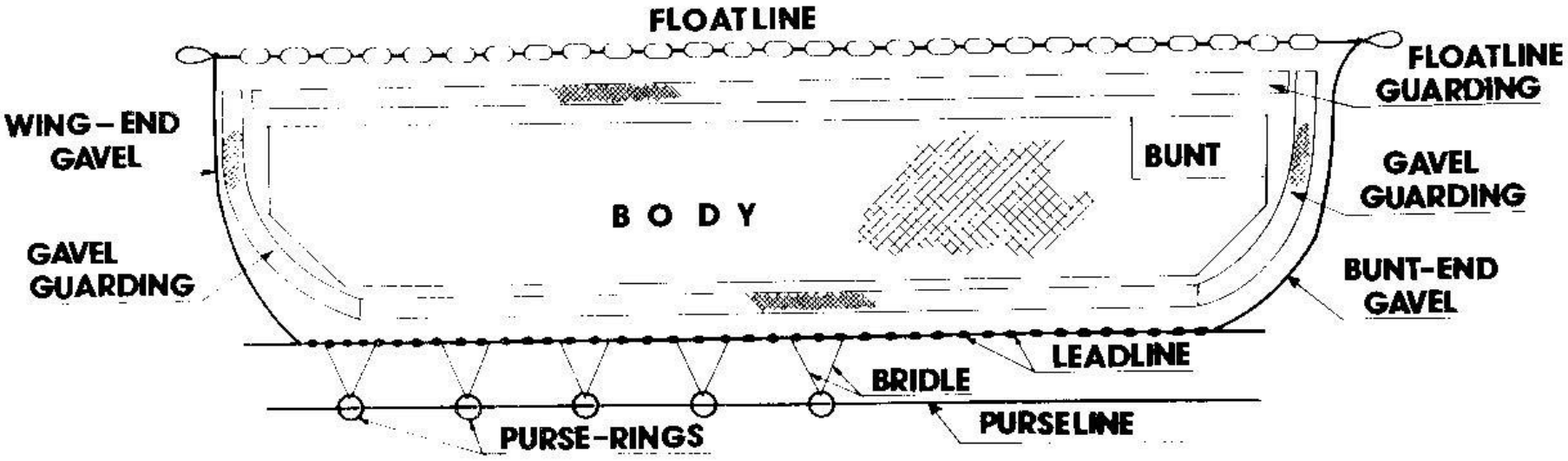


Figure 13. The parts of a purse-seine

BenYami 1987

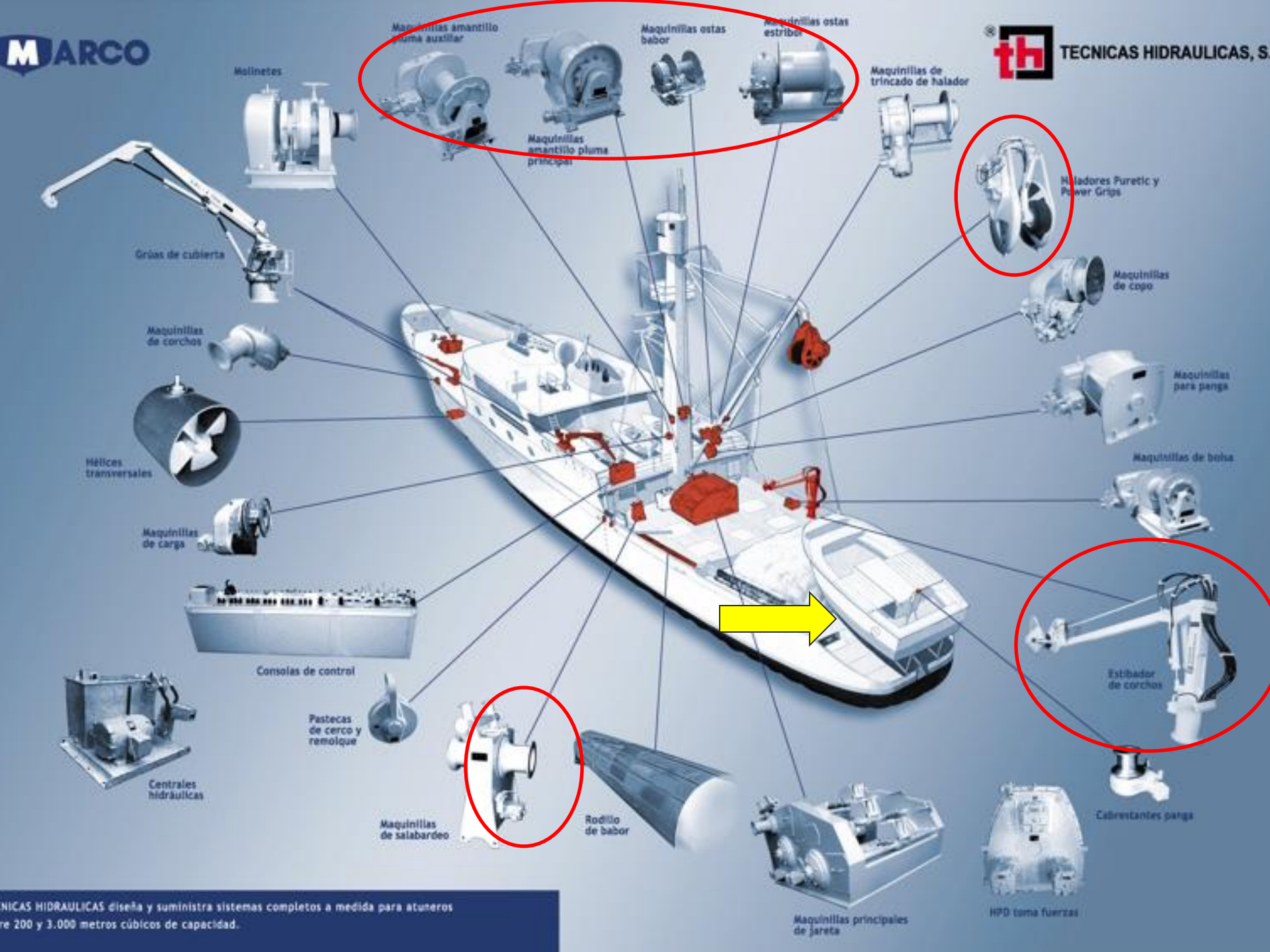
Gear description

Lead line

Purse ring

Purse line

www.seattlemarine.net


MARCO
TECNICAS HIDRAULICAS, S.
Molinetes
Maquinillas amantillo pluma auxiliar
Maquinillas amantillo pluma principal
Maquinillas ostas babor
Maquinillas ostas estribor
Maquinillas de trincado de halador
Haladores Puretic y Power Grips
Maquinillas de copo
Maquinillas para panga
Maquinillas de bolsa
Estibador de corchos
Cabrestantes panga
HPD toma fuerzas
Maquinillas principales de jareta
Rodillo de babor
Maquinillas de salabardeo
Pastecas de cerco y remolque
Centrales hidráulicas
Consolas de control
Maquinillas de carga
Hélices transversales
Maquinillas de corchos
Grúas de cubierta
NICAS HIDRAULICAS diseña y suministra sistemas completos a medida para atuneros
re 200 y 3.000 metros cúbicos de capacidad.

Purse seining – locating fish

Purse seining – locating fish - cues

Purse seining – locating fish

Bird radar

http://tunaseiners.com

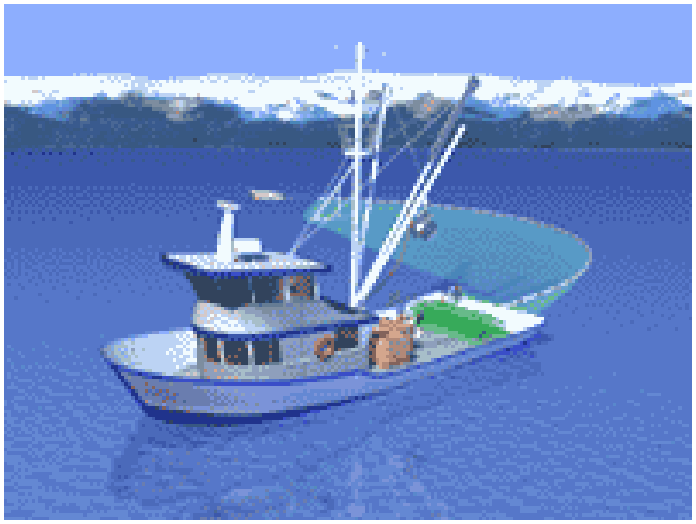
Sonar

www.simrad.com

http://forman.en.ec21.com

Purse seining – how it works

- Gear deployment
- Gear retrieval



Animation: *www.montereybayaquarium.org*

Purse seining – how it works

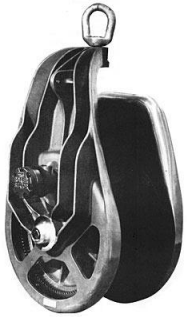
- Video #1
- Video #2 (alternate)

Gear retrieval – net hauling systems

“Duplex” style double sheave power block. (Figure 13 in Itano 2003)

Triplex power block (Gillett) (Figure 14 in Itano 2003)

Petrel_V-type Netwinch *(http://www.petrel.co.za/default.asp)*



Power block
http://tunaseiners.com/blog/es/2009/02/king-of-purse-seine-fishing/

Gear retrieval – net hauling systems

Retractable deck mounted power block (Figure 19 in Itano 2003)

Sacking up with rail roller and pinch hauler on Japanese group seiner (Figure 23 in Itano 2003)

Side rail rollers
© Alex Hofford
(http://www.alexhoffordphotography.com)

Gear retrieval – purse line winch & capstan

Rapp Hydema
(*http://www.nauticexpo.com)*

CMT (*http://www.nauticexpo.com)*

CMT Capstan
(http://www.cmtwinches.com/)

KARM (*http://www.nauticexpo.com)*

Gear retrieval – purse rings

Old style steel rings with chain bridles (Figure 3 in Itano 2003)

Securing rings to the ring stripper prior to net retrieval (Figure 4 in Itano 2003)

Stainless steel roller snap rings (Figure 5 in Itano 2003)

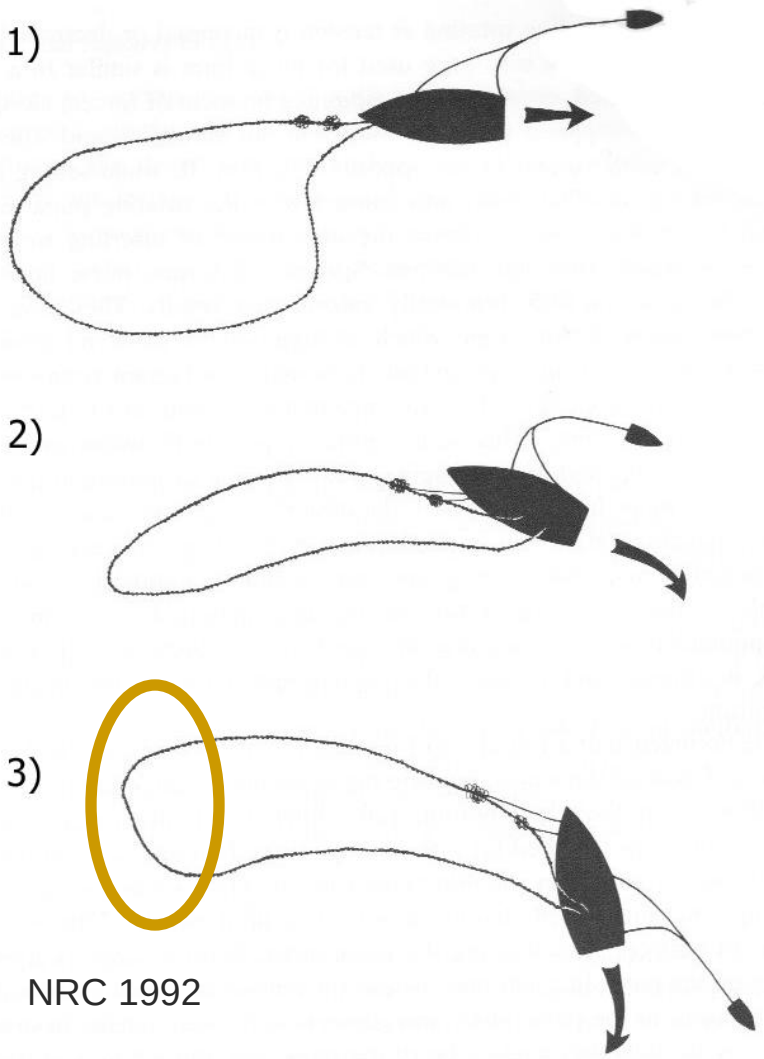

lizardwisdom/flickr.com


SEINERS.COM


©2009 Alex Hofford

Marine mammals

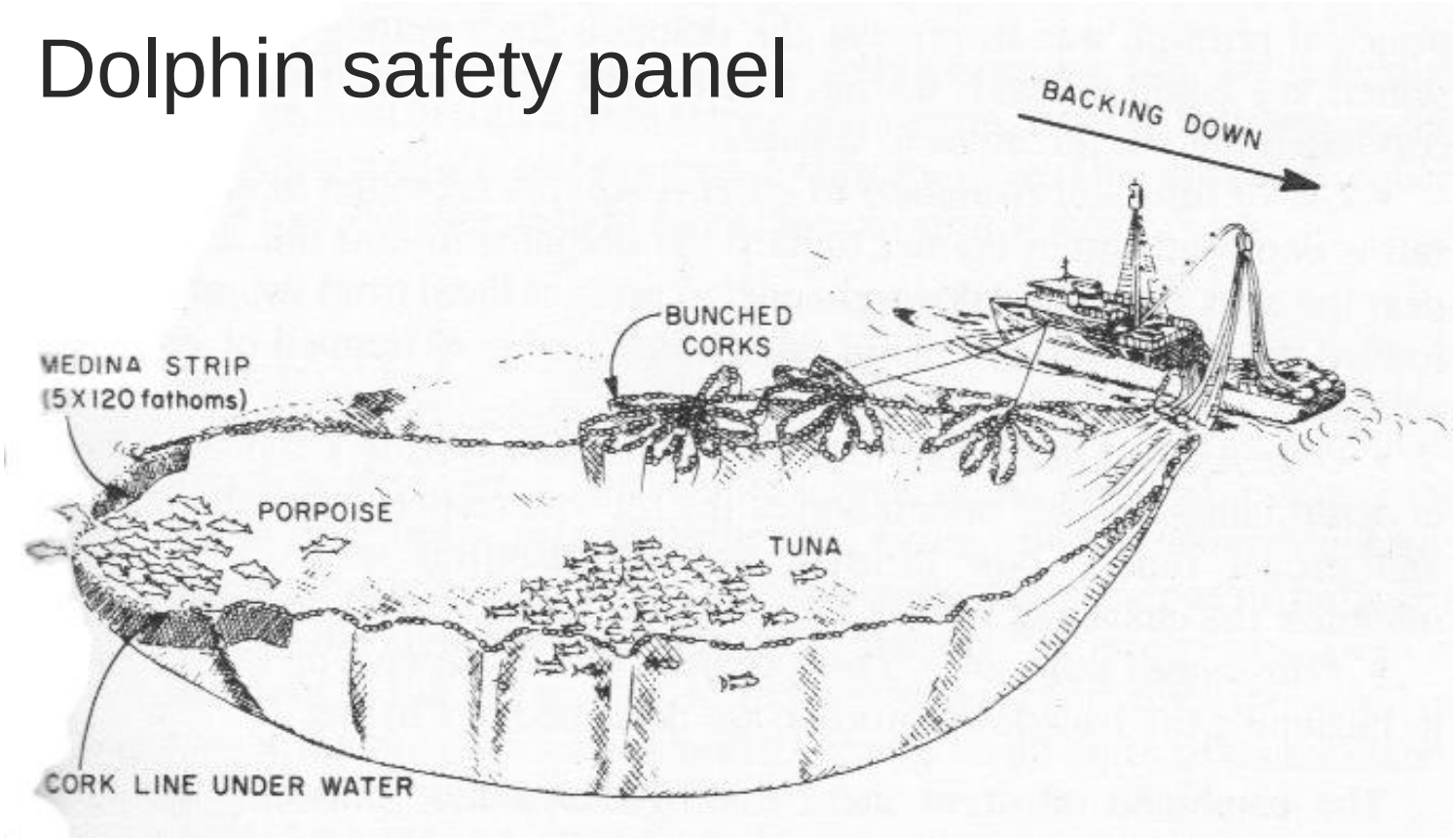
- Backdown procedure



NRC 1992

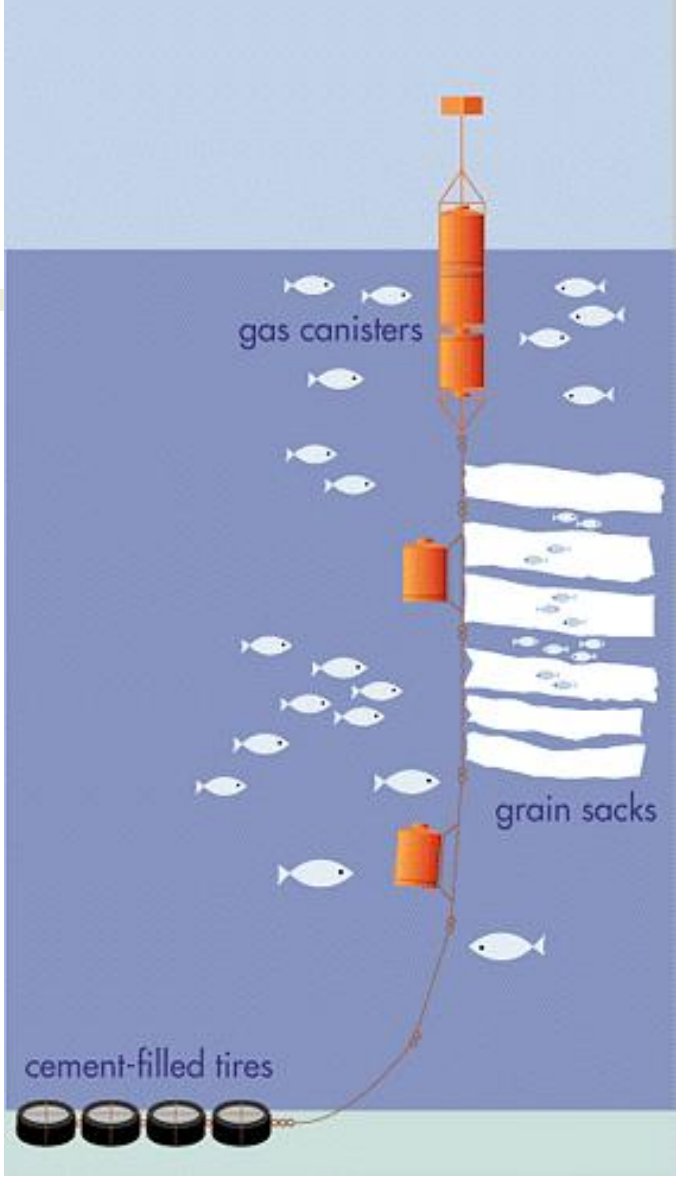
Marine mammals

- Backdown procedure
- Dolphin safety panel



Floating objects

IFREMER/M Toquet



FAO Cape Verde FAD installation:
http://www.fao.org/english/newsroom/highlights/2001/010102-e.htm

Gear Description - Purse Seine

Observer code	Vessel code	Trip ID

Page ____ of _____

	Description	Manufacturer	Model	Rail capacity (MT)	
Net Hauling system				Primary	
				Secondary	
Purse line winch				Secondary	

Net Characteristics

Net #:		Total length (m):	Total depth (m):	
Float line length (m):		Lead line length (m):		
Mesh	Size (cm)	W / D	Hanging Ratios	
	Type (circle one)	Knotted / Knotless	Float line:	Lead line:
Purse line material		Purse line diameter (mm)		

Dolphin Safety Panel

Total length (m):		Total depth (m):	
Mesh size (cm)	W / D		

Net diagram

Gear Description - Purse Seine

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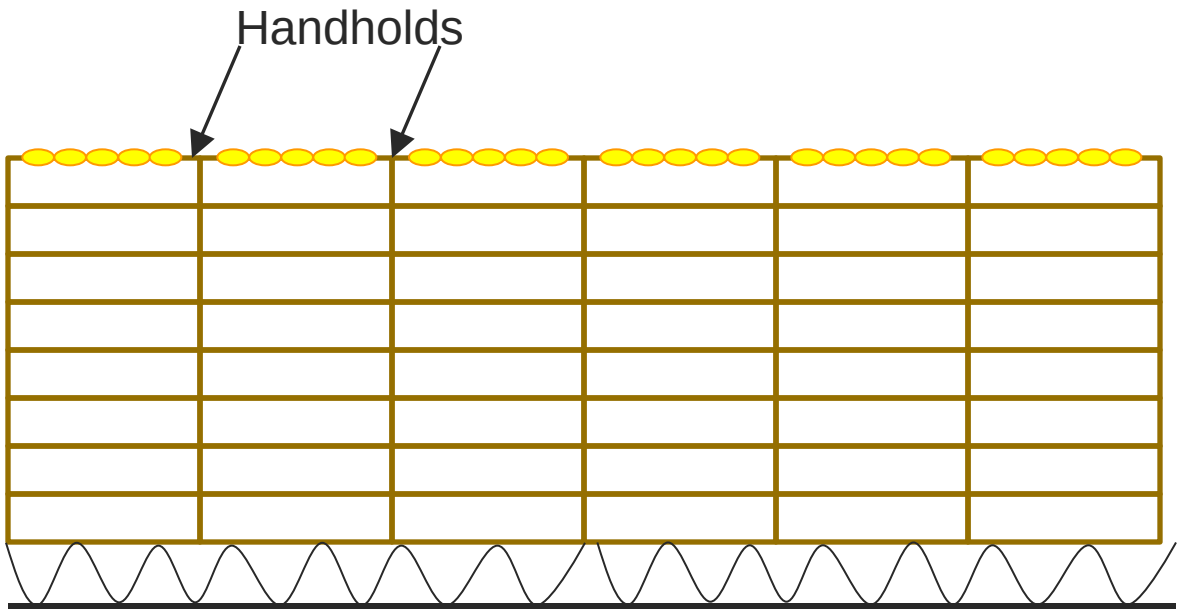
Dolphin Safety Panel

Total length (m):		Total depth (m):	
Mesh size (cm)	W / D		

Net diagram

Gear description form

- Total length of net = count of handholds * distance between handholds



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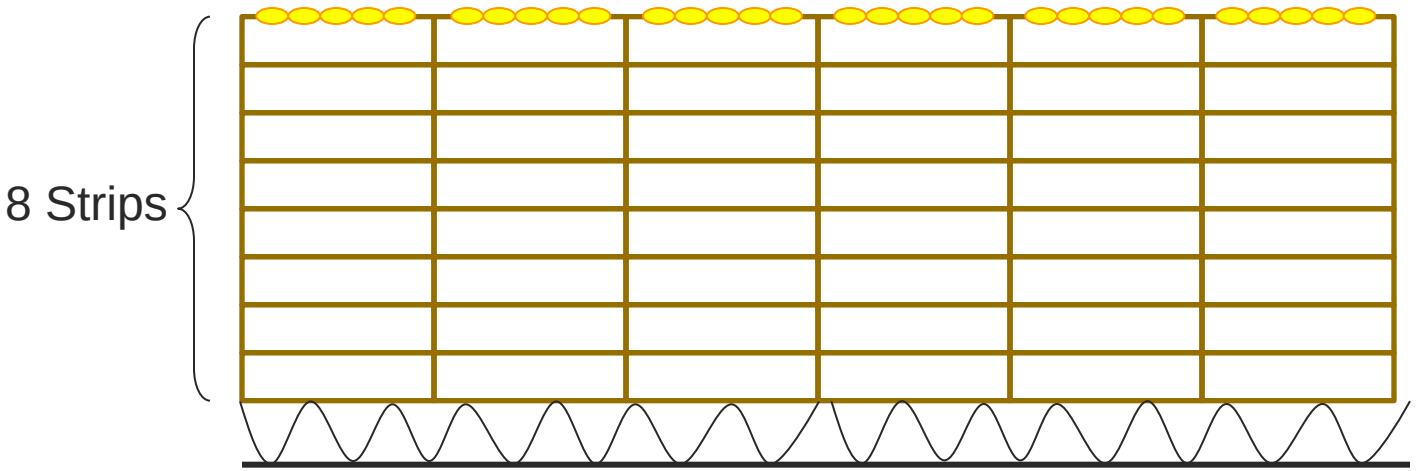
Dolphin Safety Panel

Total length (m):	Total depth (m):	
Mesh size (cm)	W / D	

Net diagram

Gear description form

- Net depth = # strips * strip height



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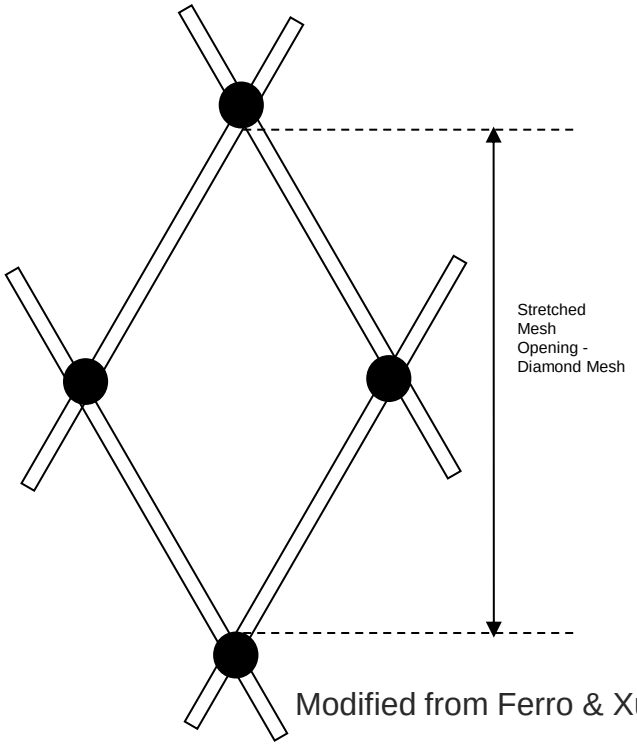
Dolphin Safety Panel

Total length (m):		Total depth (m):	
Mesh size (cm)	W / D		

Net diagram

Gear description form



Modified from Ferro & Xu 1996

Knotted braided polyethylene mesh
http://www.haverford.com.au

Knotless twisted nylon mesh
http://www.haverford.com.au

Gear Description - Purse Seine

Observer code	Vessel code	Trip ID

Page ____ of _____

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Dolphin Safety Panel

Total length (m):		Total depth (m):	
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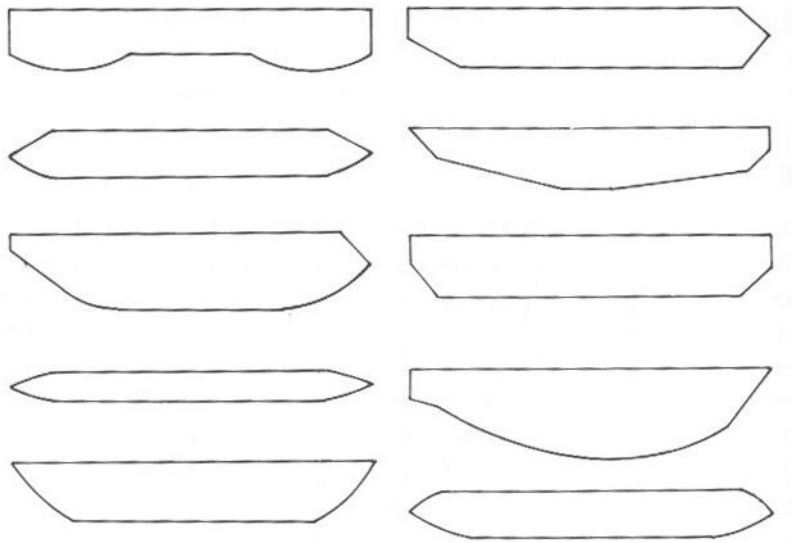
Net diagram

Gear description form

Net diagram

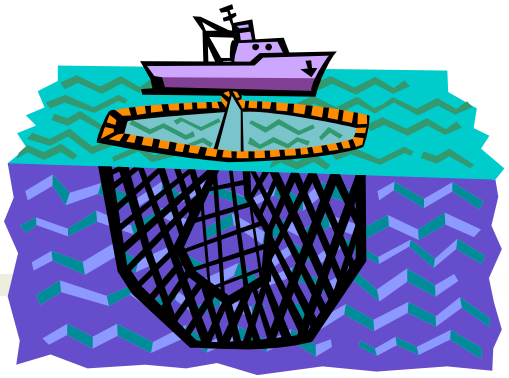


Comments

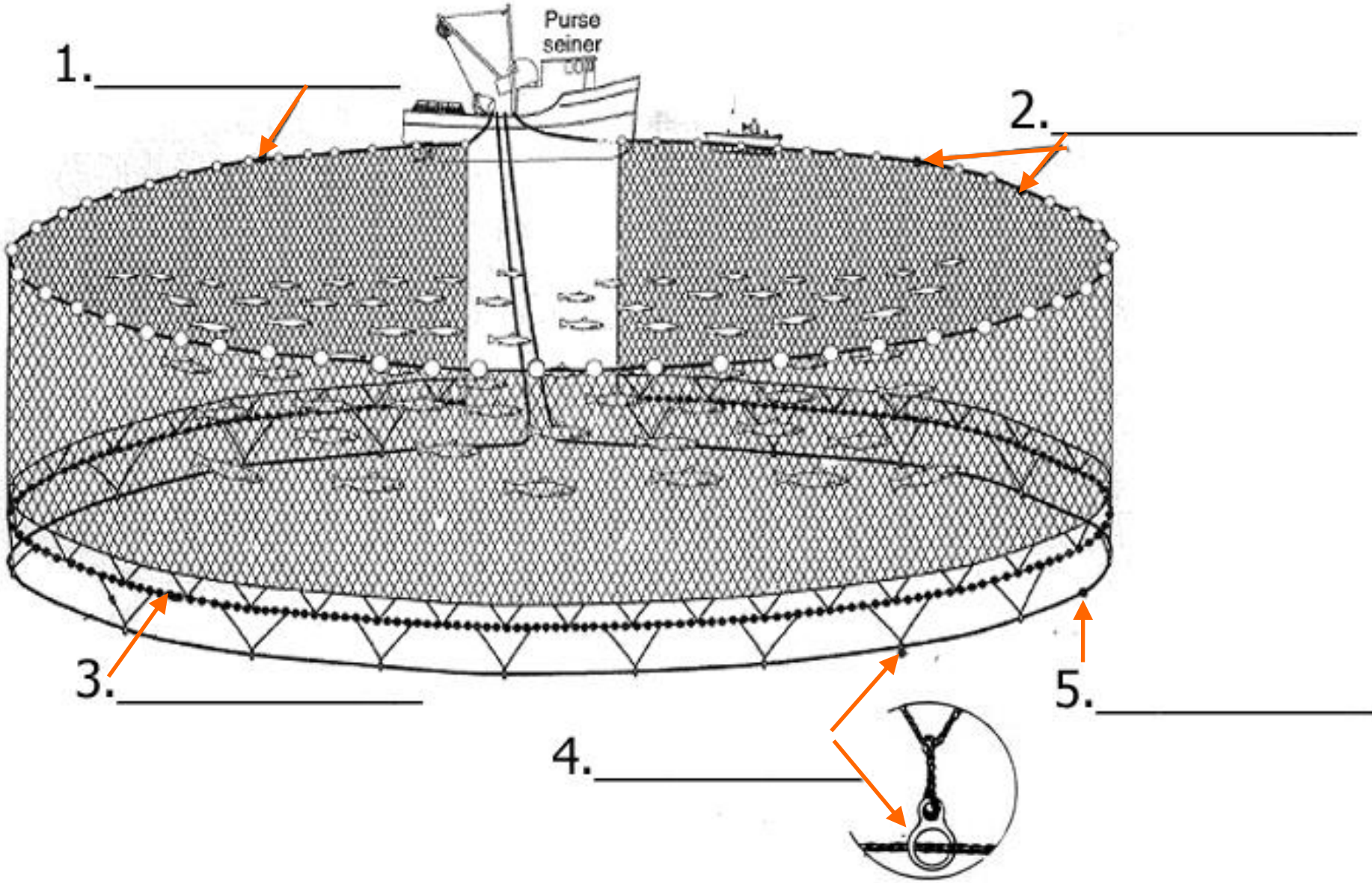
Gear description form

- Questions
- Practice exercise – 15 minutes
- Additional Information:
  - Purseline: 8mm Spectra™

Summary



- Describe how purse seine gear works
- Explain how marine mammals can be released safely


Purse
seiner
1.
2.
3.
4.
5.


http://www.bdoutdoors.com/

http://tunaseiners.com

Rapp Hydema
(*http://www.nauticexpo.com)*

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- Ferro, R. S. T., and L. Xu. 1996. An investigation of three methods of mesh size measurement. Fisheries Research **25**:171-190.
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Purse seines hauled by a power block

http://www.fao.org/fishery/equipment/powerblock/en

SIXTY ANNIVERSARY OF PATENTING POWER BLOCK - SHORT STORY ON MARIO PURATIĆ (1904-1993)

POWER BLOCK-MARIO PURATIĆ

Power block is a mechanized pulley used to haul in nets, purse seine, etc.

During the last decades, fishermen and deck equipment manufacturers introduced various ingenious innovations aimed to reducing manpower on board and facilitating the working procedure during fishing operations. One such innovation was the **power block**. No single invention has contributed more to the success of purse seine net hauling than extensive line of **Power Blocks.**

First introduced in the 1950's the **Puretic Power Block** line became the linch-pin in the mechanization of purse seining. Combined with fluid hydraulic power technology and new large synthetic nets, it changed the whole character of purse seine fishing. The original **Puretic power block** was driven by an endless rope from the warping head of a winch.

Such **power blocks** seem to be now used rarely, if at all. Nowdays, as a rule, power blocks are driven by hydraulic pumps driven from the main or auxiliary engine.

http://www.fao.org/fishery/equipment/powerblock/en

POWER BLOCK-MARIO PURATIĆ

Mario Puratić (Sumartin, Island Brač, Croatia, 26 June 1904. – Santa Barbara, California, USA, 6 January 1993.) – Croatian fisherman from Brač becomes and American inventor – (usually spelled Puretic or Puretich in English)

Birth house

Mario Puratić

POWER BLOCK-MARIO PURATIĆ

- born in a family of farmers and fishermen

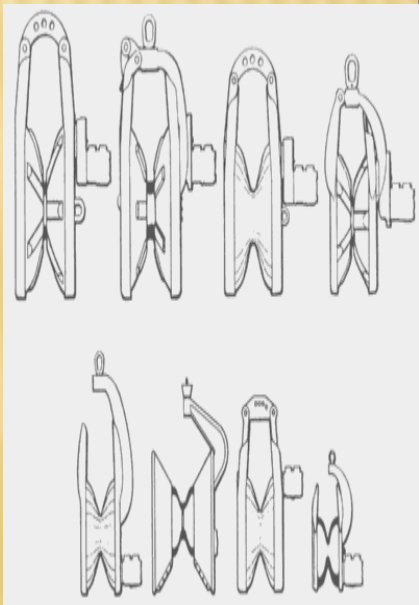
- as many of his countrymen, he left his home in 1925 to seek a better life in the United States, where he was a hard-working fisherman on large tuna purse seiners

-in 1954 he invented fishing equipment that revolutionized the technology of hauling fishing nets; patent approval was on 7th Feb 1956

-- Until then fishing nets had to be manually drawn by eight to ten people, which was an extremely difficult job. The Marco Seattle company developed Puratic's idea, and it soon became a standard mean of fishing in the whole world.

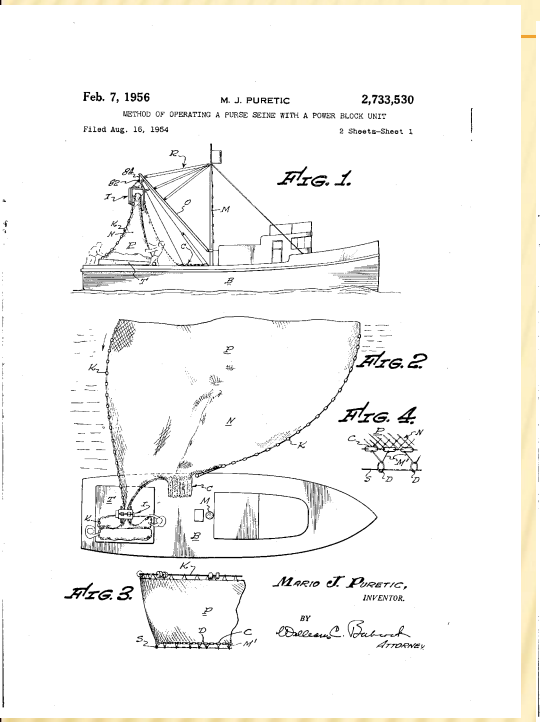
- Another phase of fishing history had begun!!!!

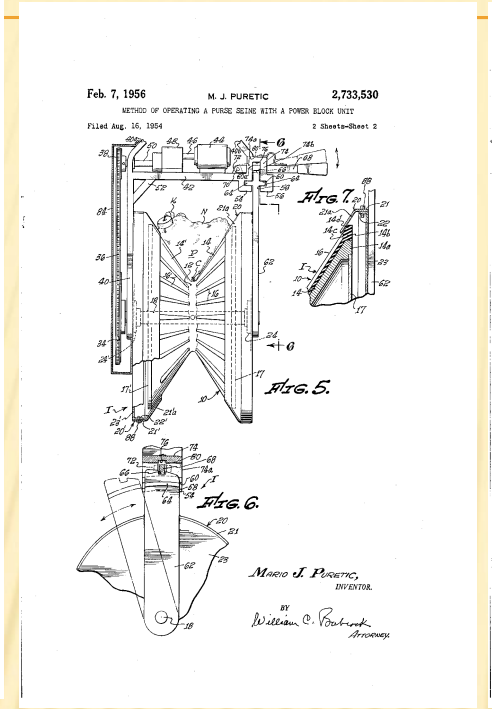
- *Puratic Power Block has a form of a pulley with a central rotating element wrapped in* hard rubber

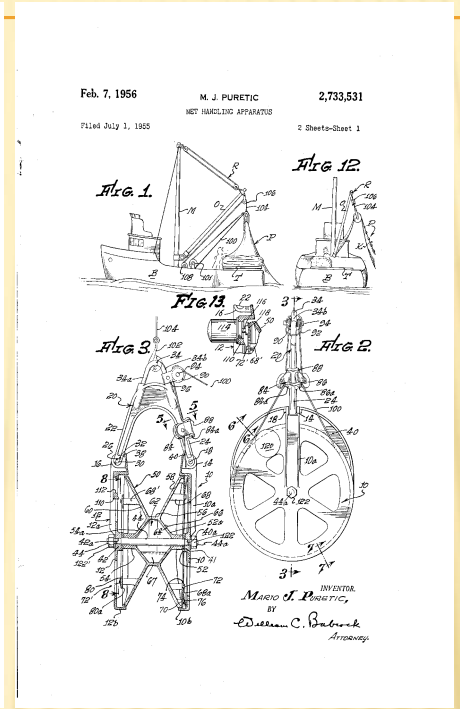


Detailed patent figures

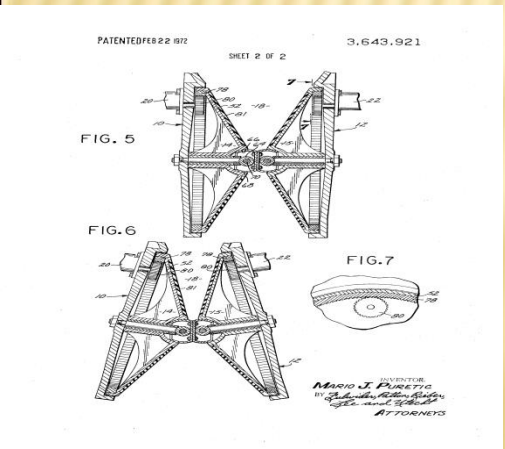
He was an honorary citizen of many countries, including Iceland.

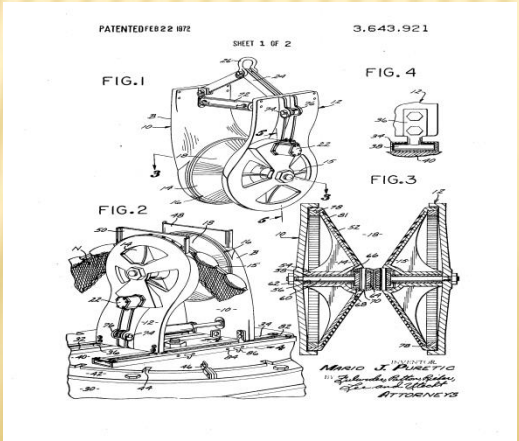






"King of Purse Seine Fishing"





Mario Puratić, the **father of the fishing industry**, inventor of the *Puretic Power Block*

- A Croatian who has done more than any other man to change the face of the fishing industry

POWER BLOCK-MARIO PURATIĆ

- for his invention Puratić was given the National Inventor of the Year Award by the American Association for the Advancement of Invention and Innovation in 1975; he was elected among hundred greatest USA inventors of the 20th century
- in 1972 the National Bank of Canada issued a new series of 5 dollar banknotes with the Puretic Power Block on a fishing boat-salmon seiner drawn on the reverse side

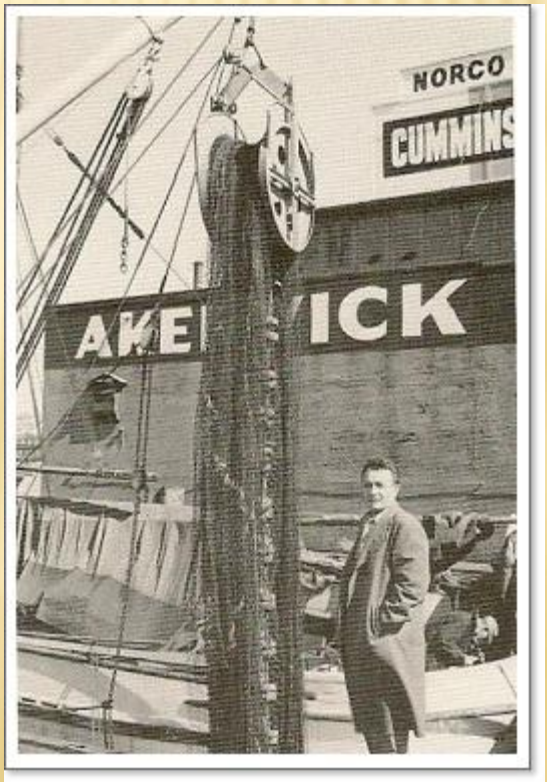
When Mario Puratić died, his remains were brought from the USA to his native town of Sumartin in 1994.

http://www.croatianhistory.net/etf/puretic.html

On the memorial board is staying (among others):

“Perfection of simplicity built into the winch has halved the torments of fishermen”

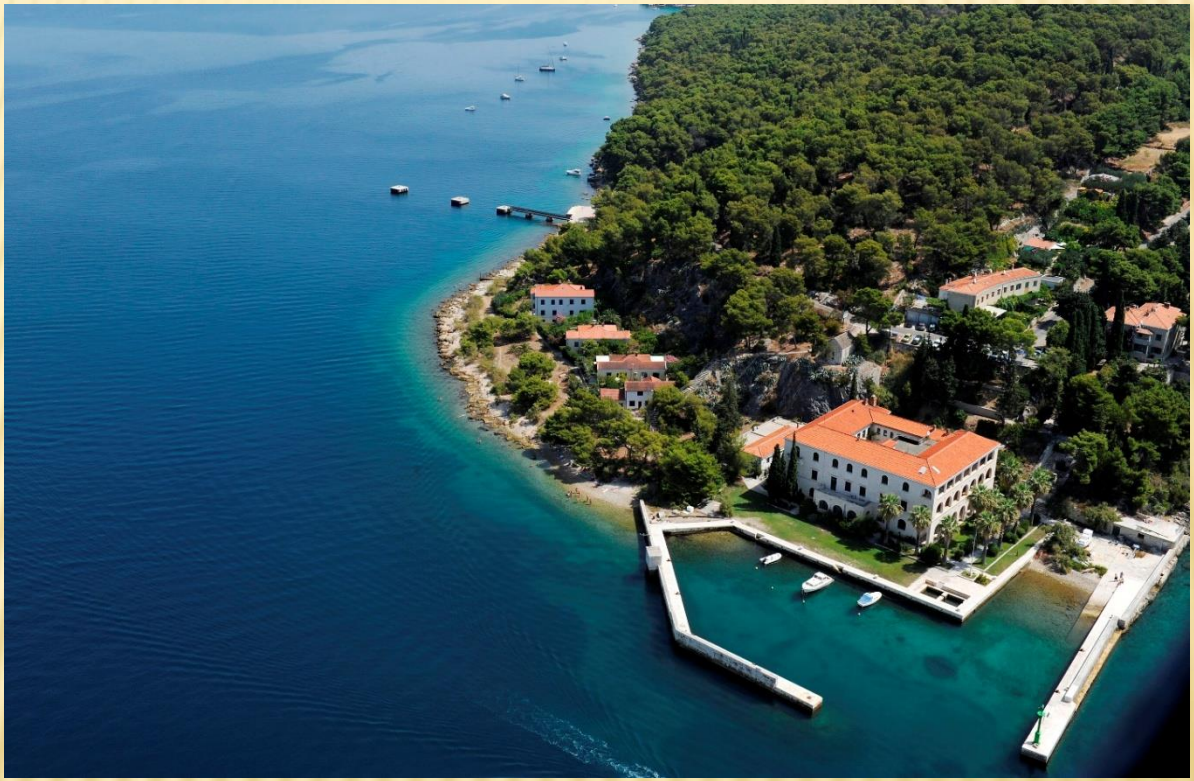
•If we paraphrase old Latin saying **“Navigare necesse est, vivere non est necesse!**” (in English: “To sail is necessary, to live, it is not necessary”) for the Croatian scientist Mario Puratić it would read: **“It is necessary to fish, not to live!”**
•Dalmatians have fishing in their blood...they have established fishery worldwide from Alaska to Magallanes. *Ante Dundov Kongo, Kali*



Jakov Kuljiš and **Ivan Dellaitti** produced the first acetylene lamps for night fishing;
Petar Dragić, the purse seine net, the precursor of today's monster nets;
Mario Puratić the power block, essential equipment on any fishing boat;
Ante Nižetić nylon nets, to replace those made with cotton;
John Rešić, the spray system to freeze fish.
They also revolutionized fish processing with **Martin Bogdanović** building the world's largest tuna cannery,
Star Kist and **Nikola Bezmalinović**, the first American floating fish factories.
Paul Martinis was proclaimed the king of Alaskan salmon fishing by President Eisenhower. ...

Dalmatian fishermen

THANK YOU FOR YOUR ATTENTION!



Institute of Oceanography and Fisheries, Split, Croatia