漁業生産の技術と魚類の行動
―生態系を守り，儲けるために―

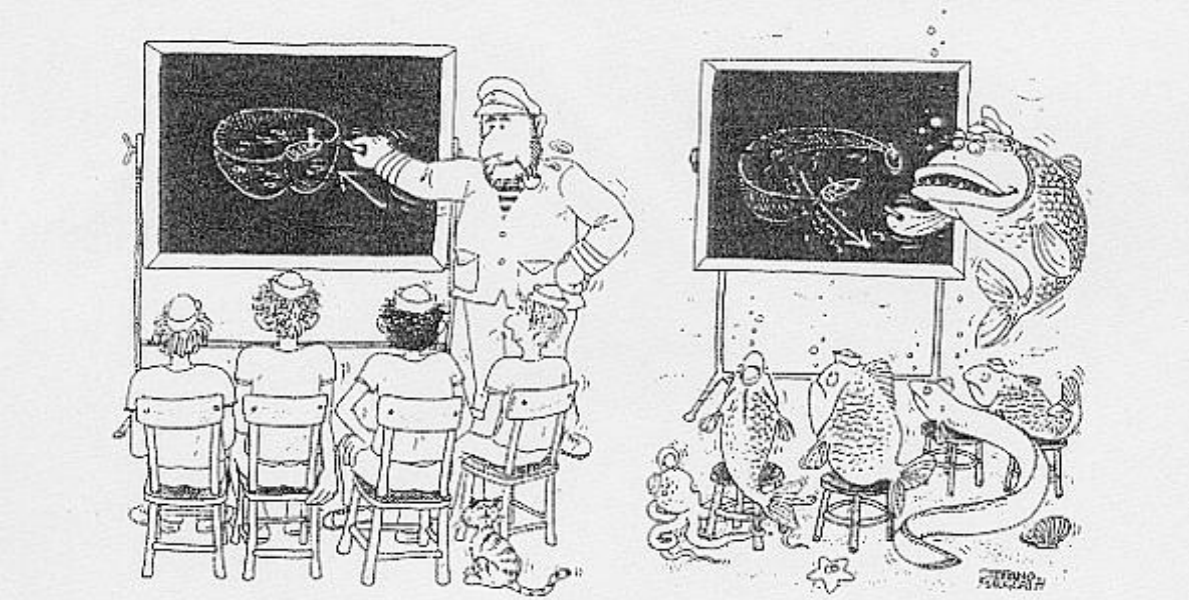


Fig.1 Fish behaviour approach for fishing technology (from "Training fishermen at sea" [1])

東京海洋大学　有元貴文

tarimoto@kaiyodai.ac.jp

漁業研究の流れ

- **効率性**の追求：一網打尽⇒収益／投資

大型化・高速化・強靭化⇒*省エネ・省力・省人化*

無理・無駄・ムラを減らす方策

- **選択性**⇒混獲投棄の解決⇒**生残性**の向上

Minimum Impact

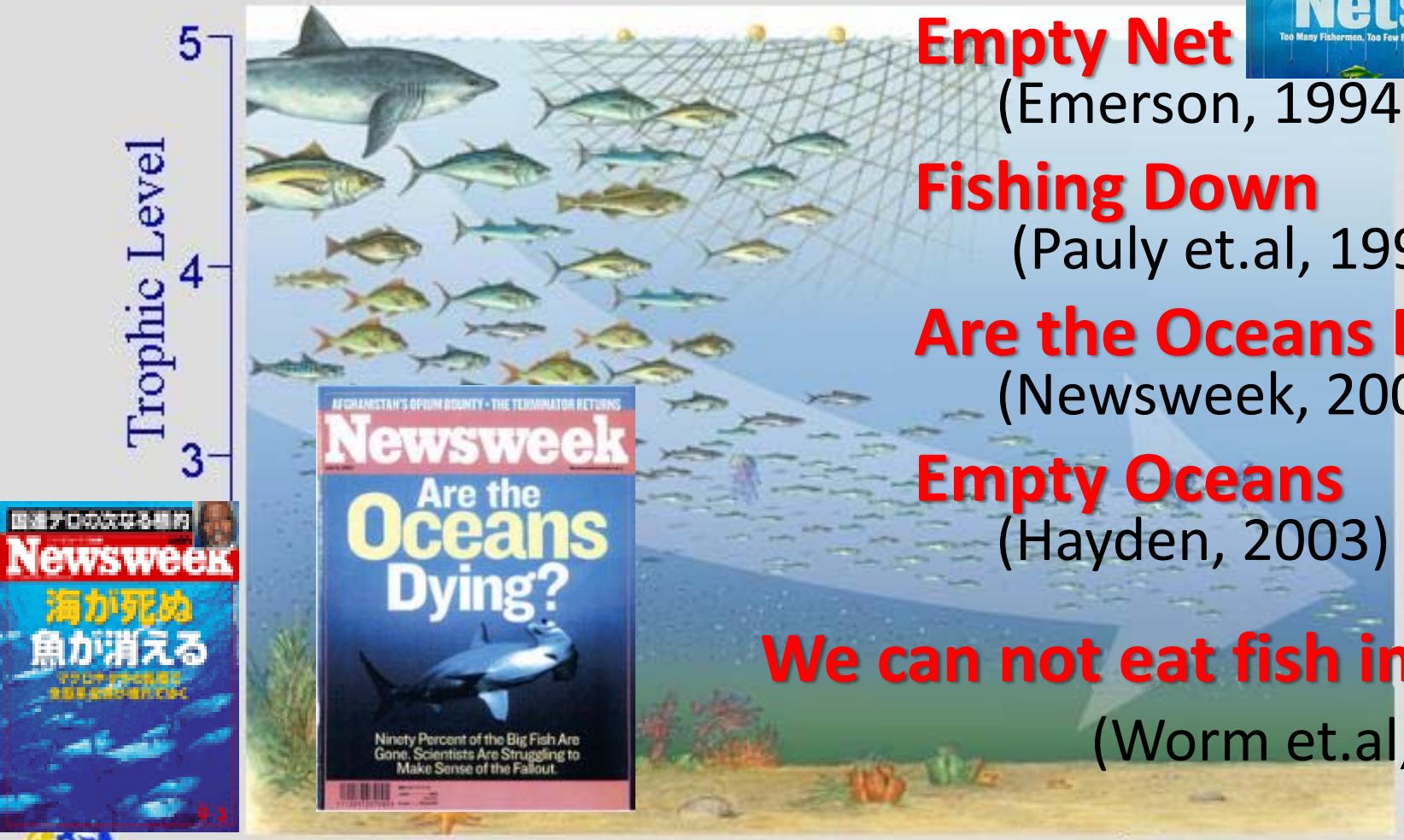
- **生態系アプローチ**： Balanced Exploitation

Reconsidering the Consequences of Selective Fisheries

海洋生態系の危機 Crisis of Ocean Ecosystem

Fishing Down Marine Food Webs

Fishing down in Global trend…?



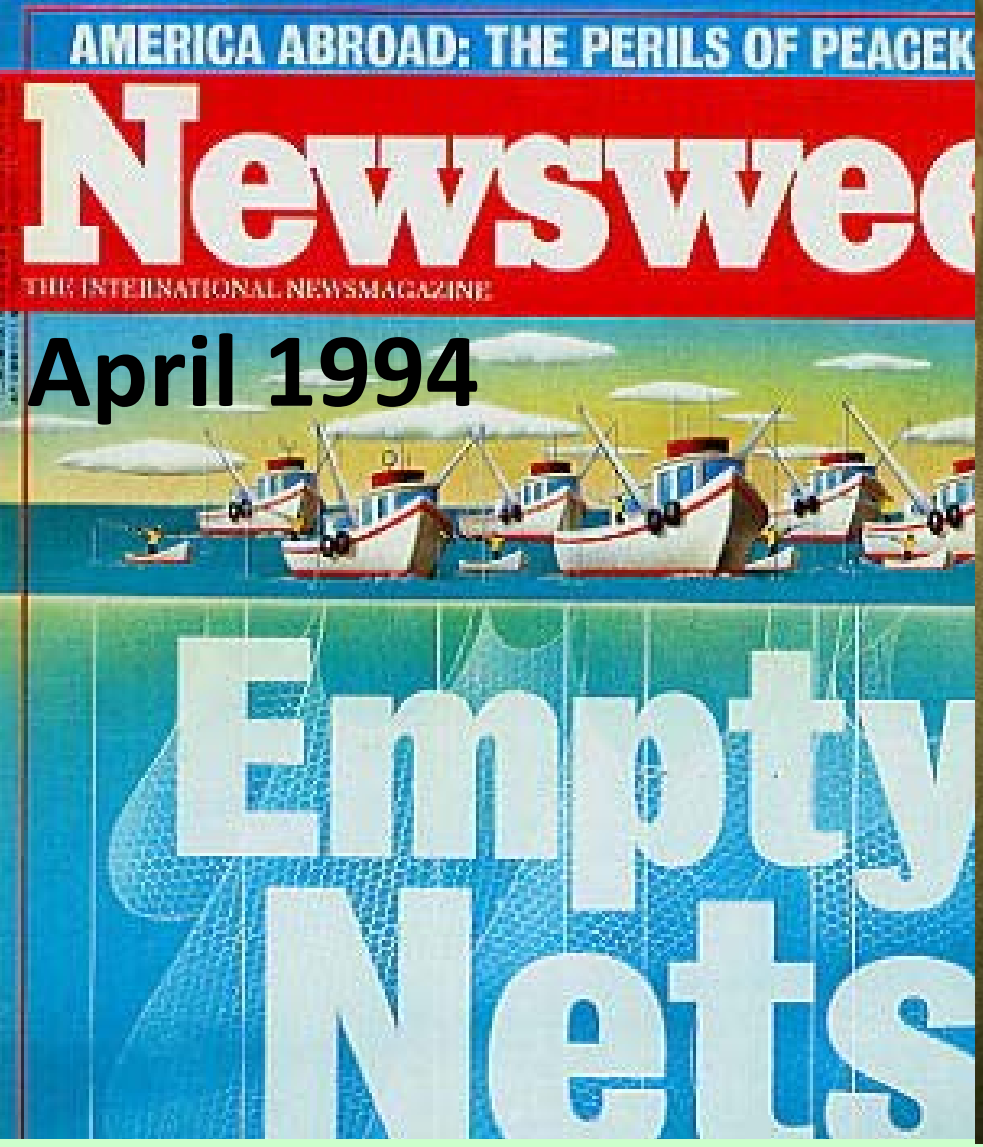
Empty Net
(Emerson, 1994)

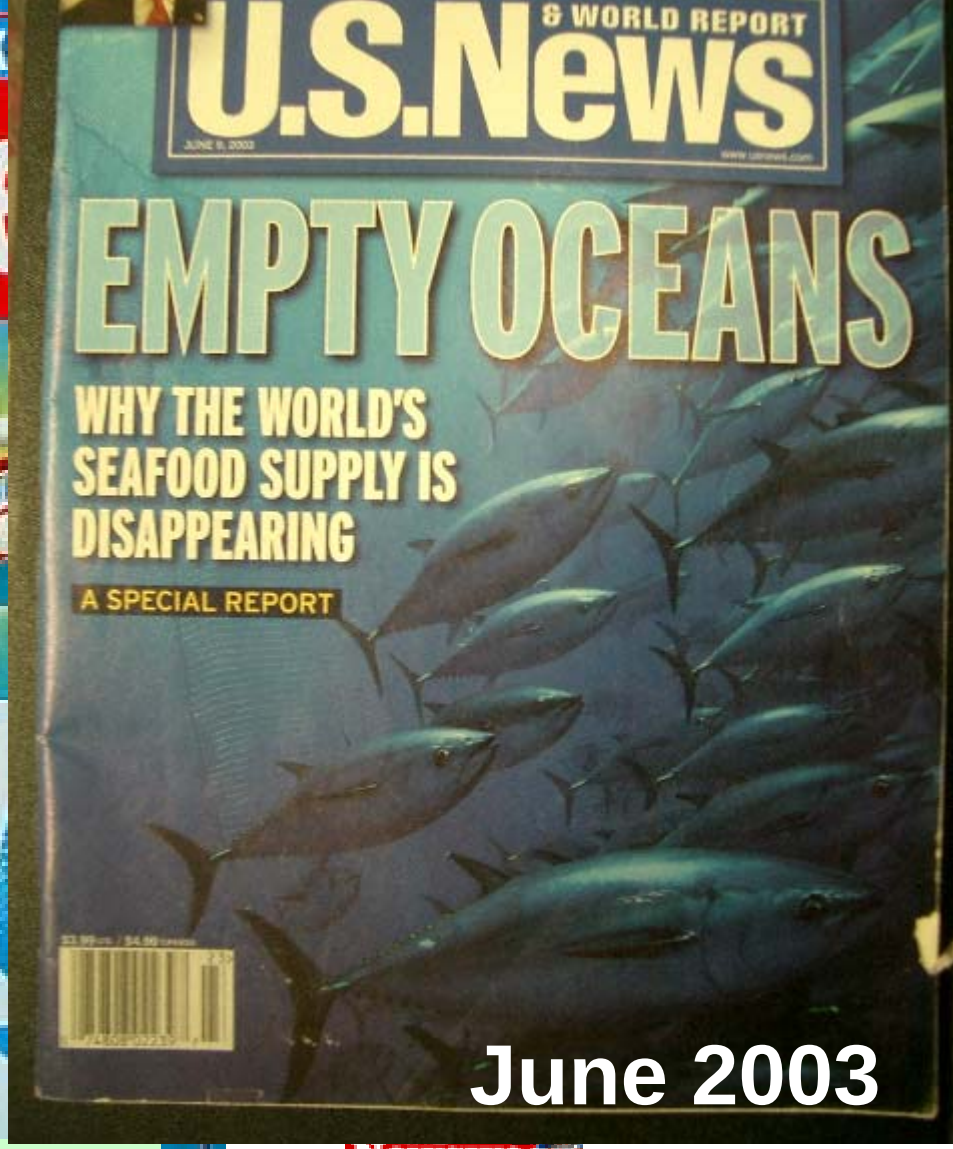
Fishing Down
(Pauly et.al, 1998)

Are the Oceans Dying?
(Newsweek, 2002)

Empty Oceans
(Hayden, 2003)

We can not eat fish in 2048
(Worm et.al, 2006)



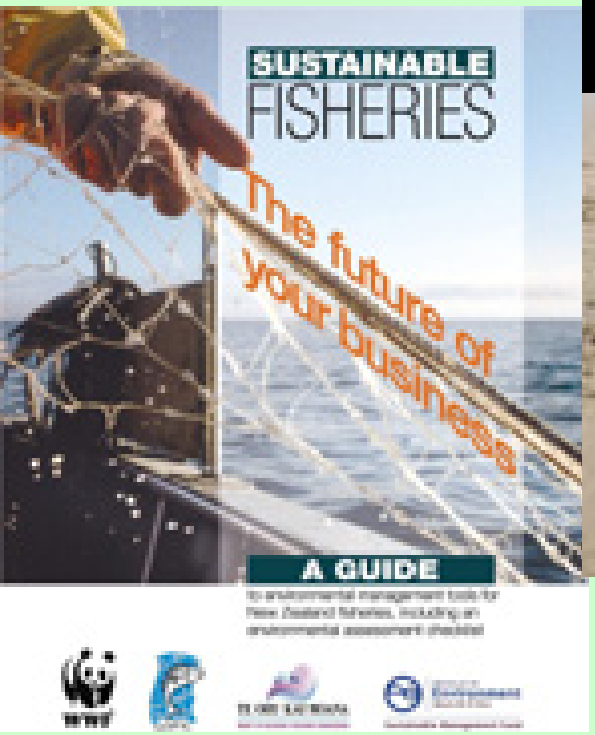


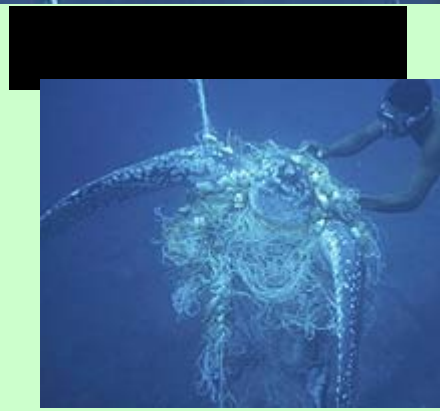
Too Many Fishermen, Too Few Fish

漁業において，目に余る悲惨な状況が続いている！

環境保護団体からの厳しい批判が続いている！

Global Marine Programme





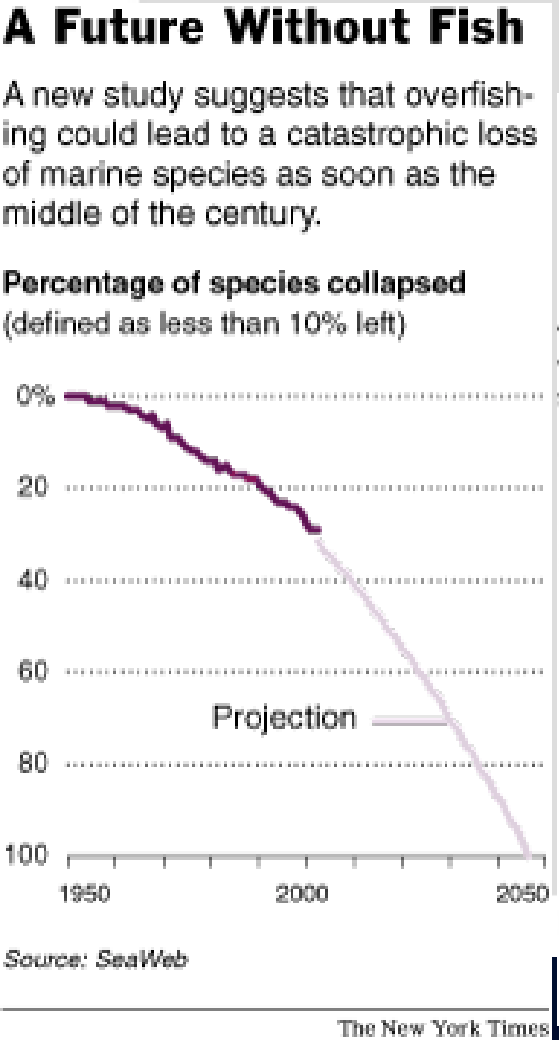
Commercial Fishing Estimated to Kill Millions of Sea Turtles

I ♥ SUSEA
海洋保護区がニッポンの寿司を守ります

I ♥ SUSEA
海洋保護区がニッポンの寿司を守ります

2048年に魚がいなくなる・・・！

Impacts of Biodiversity Loss on Ocean Ecosystem Services



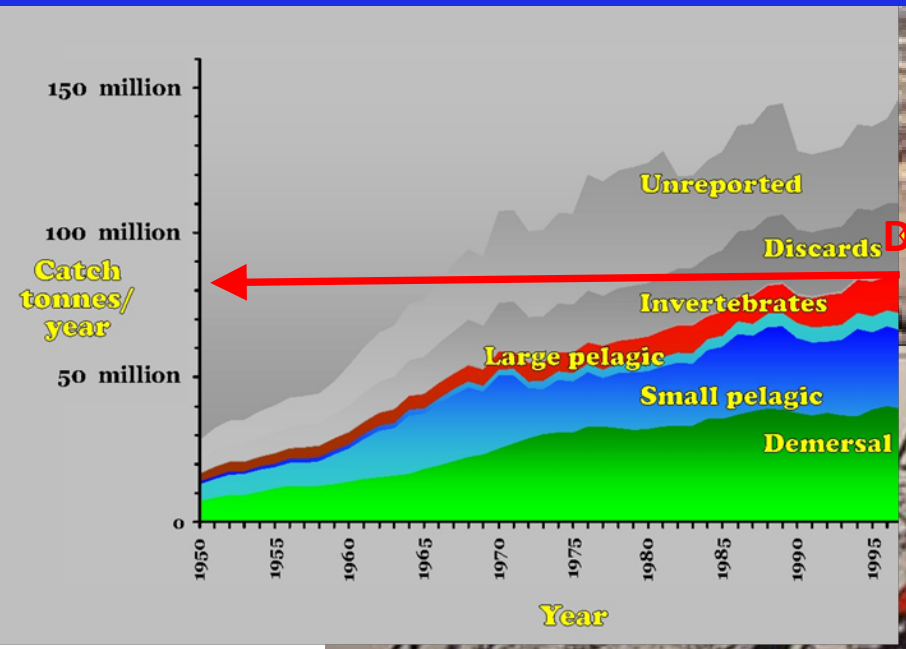
この状態を引き起こしたものは・・・？

誰が責められるべきなのか？

Not YOU,

But WE ！

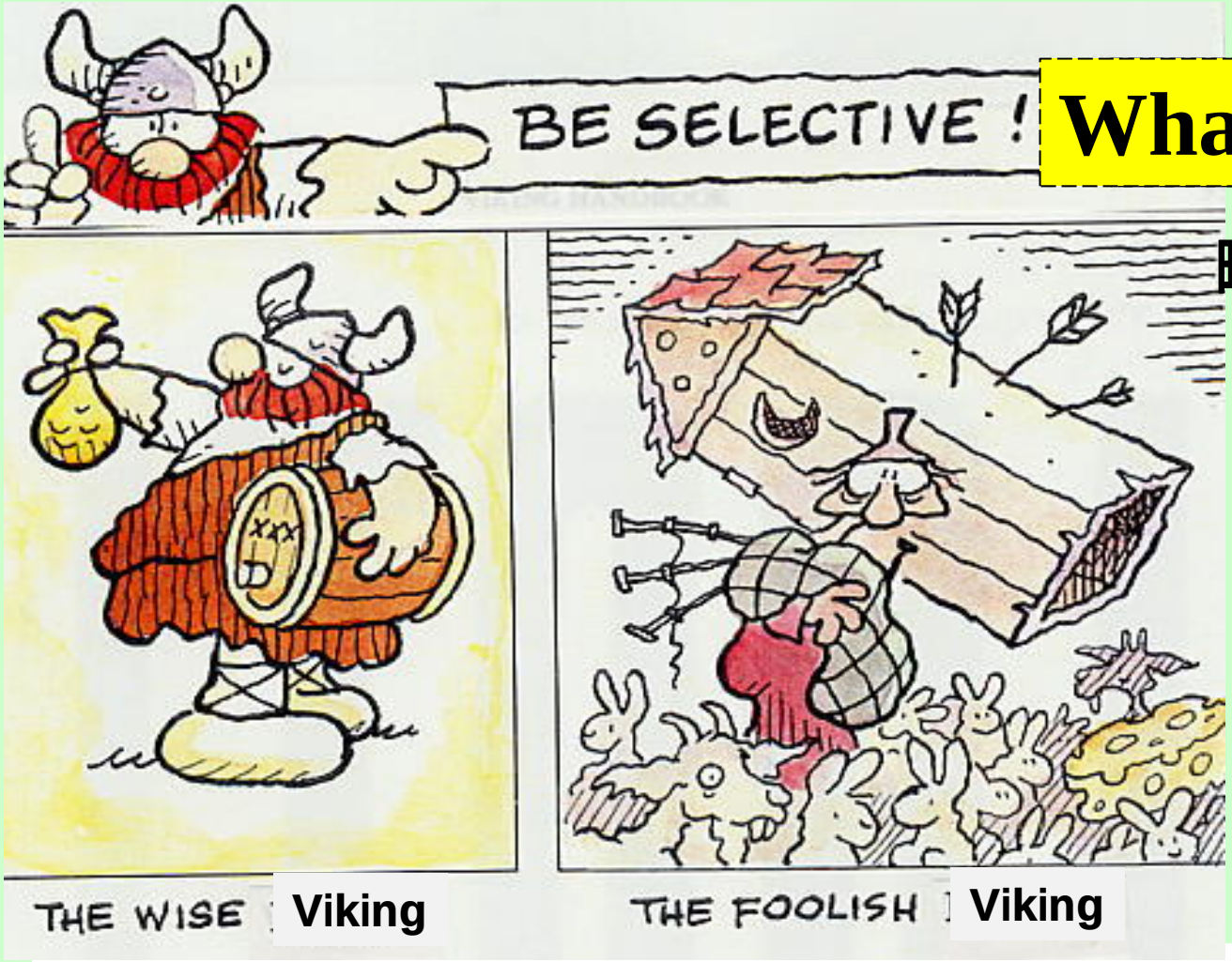
その無駄を無くせれば・・・,
特に有用魚の幼稚魚を残せれば,
生産量を伸ばすことすら夢ではない！



混獲投棄についての問題
利用せずに投棄してしまえば,
資源の無駄使い

What to CATCH!

略奪は選択的に！

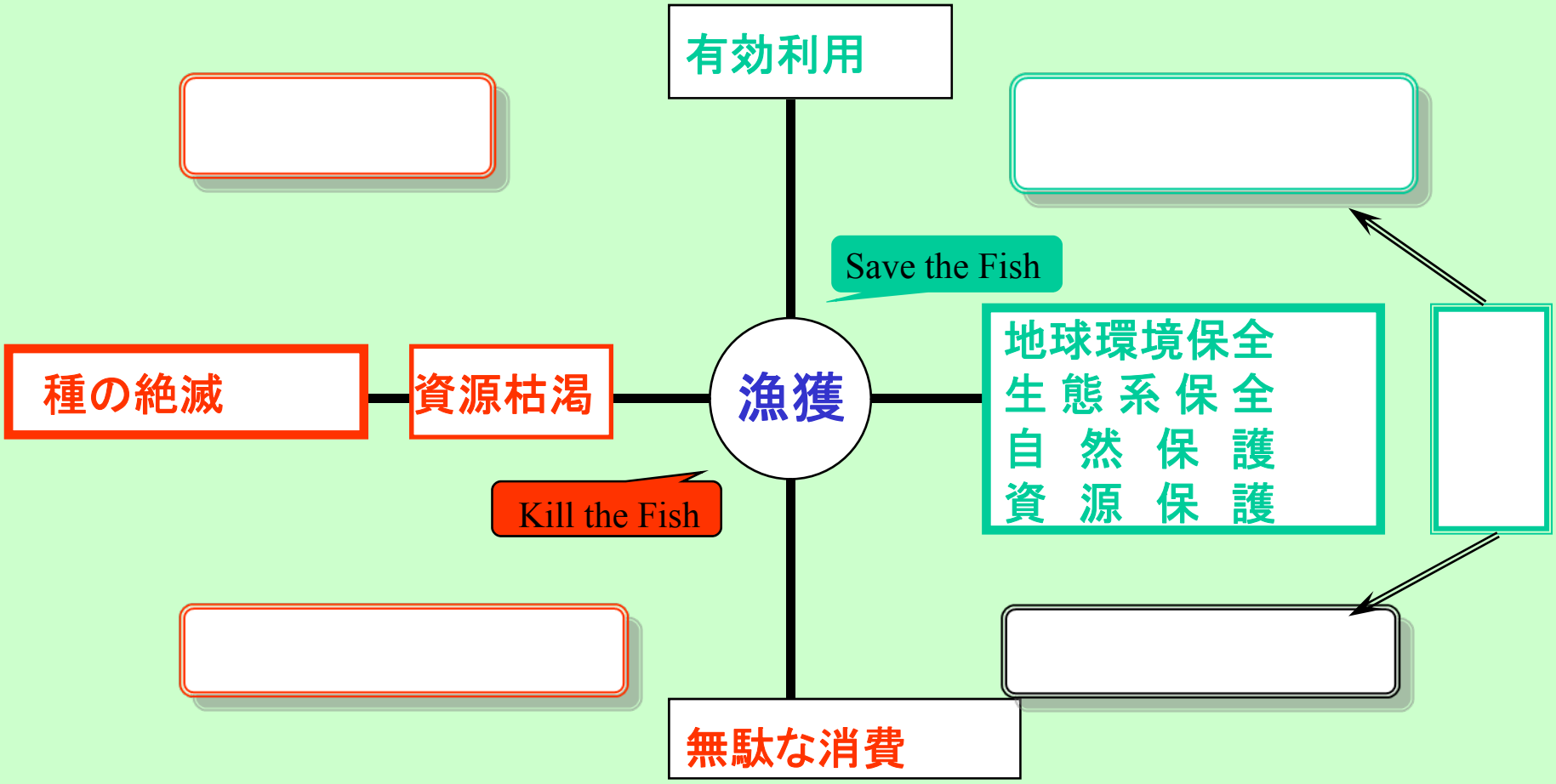


バイキング・ハンドブック

modified from
“Viking Handbook”
-Hagar the Horrible’s
By D.Browne 1985

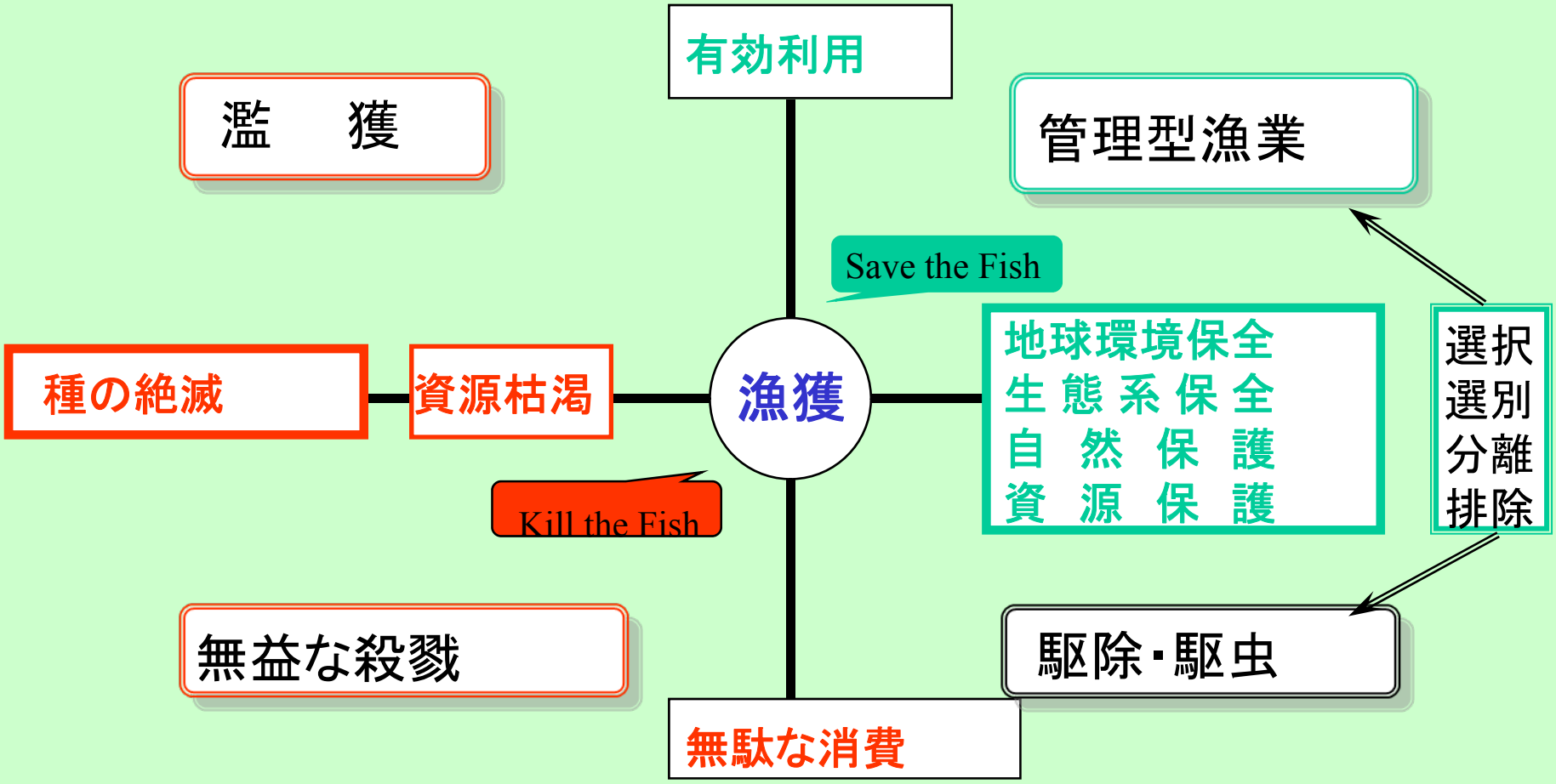
Good Catch:	Poor Catch:
Good Species	Endangered Species 絶滅危惧種
Good Size	Small Sizes / Young Stages 幼稚魚
Good Taste	Bad Taste / Poisonous 不味い，毒魚
Good Value	No Value / Debris 価値のないもの，ゴミ

Fishing Impact Terminology



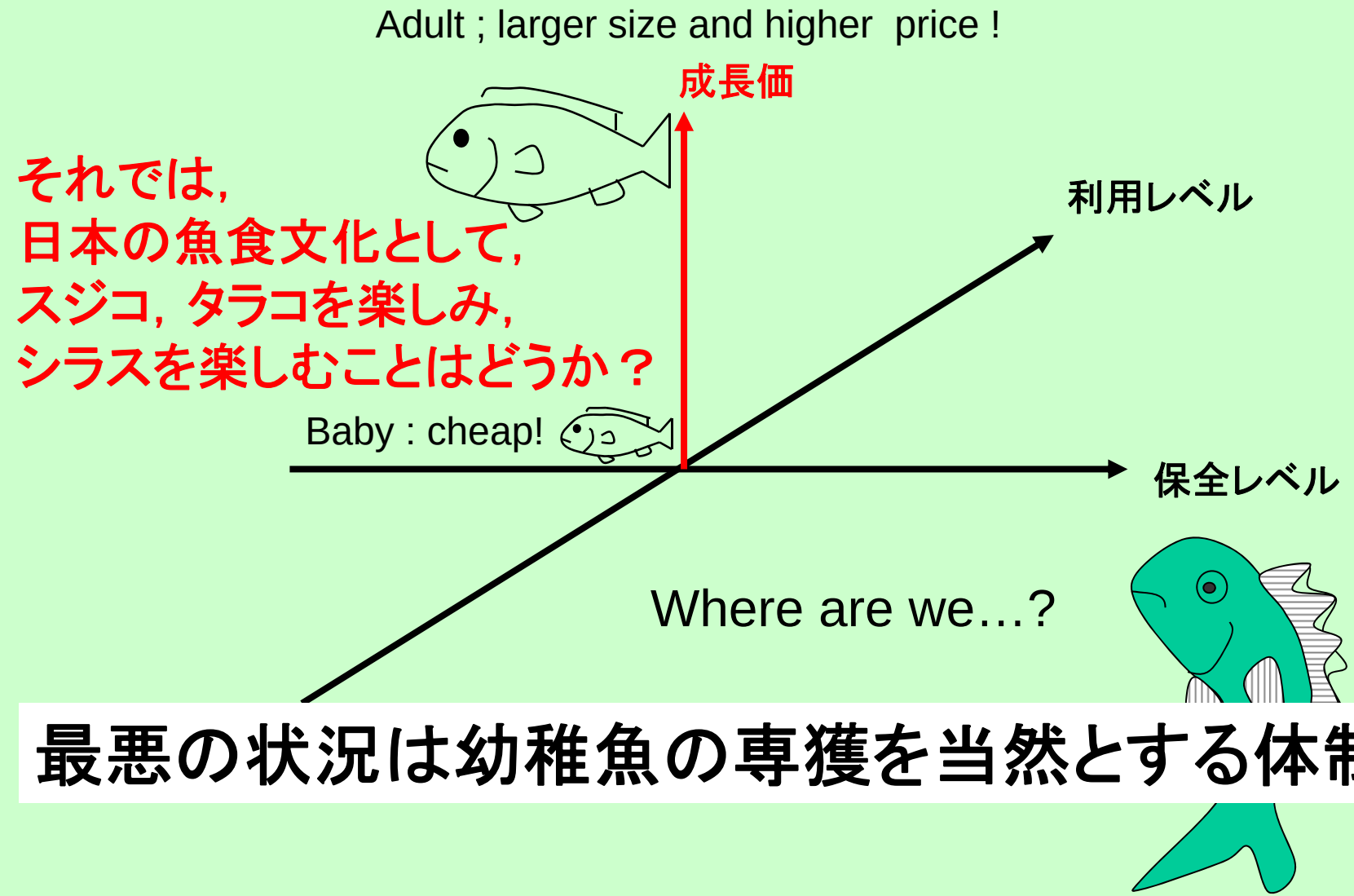
漁業をめぐる価値観の4つのカテゴリー

Fishing Impact Terminology



漁業をめぐる価値観の4つのカテゴリー

有用魚の幼稚魚が混獲され，投棄されること，
飼餌料や肥料として，そして安価な加工品として利用されることは
資源の利用法として**モッタイナイ！**



最悪の状況は幼稚魚の専獲を当然とする体制…!

海は銀行

MSY
最大持続生産量

- 元金に手をつけない！
- 利息の合理的運用
  - 必要な種類だけをとる
  - 必要な量だけをとる
  - 小さなものをとらない

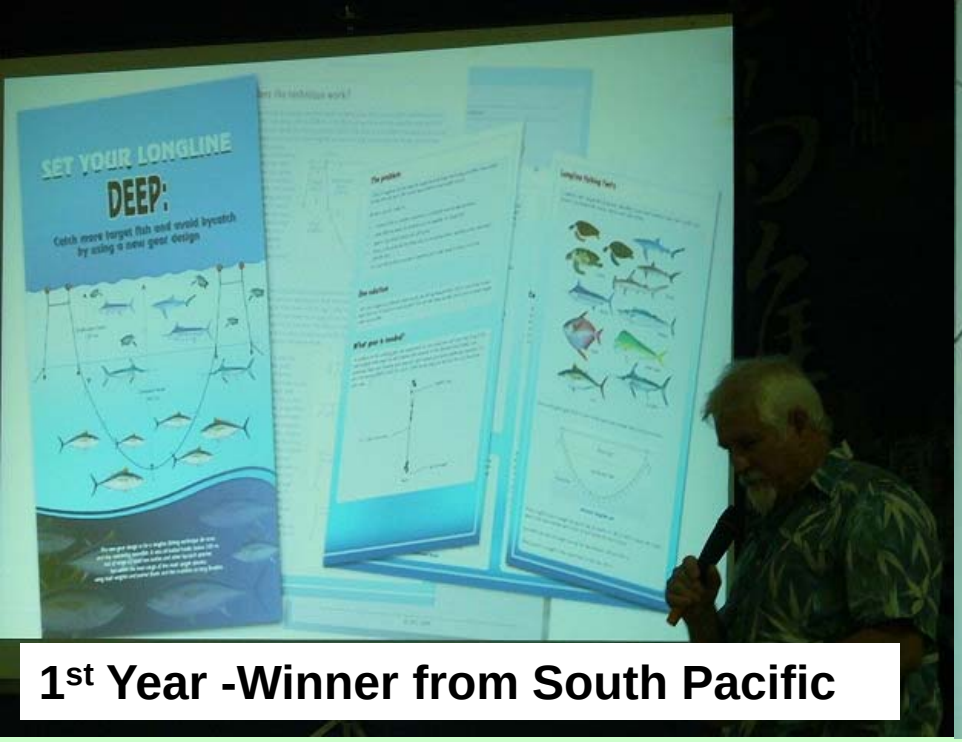
選択漁獲の技術

SMART GEAR
THE INTERNATIONAL COMPETITION

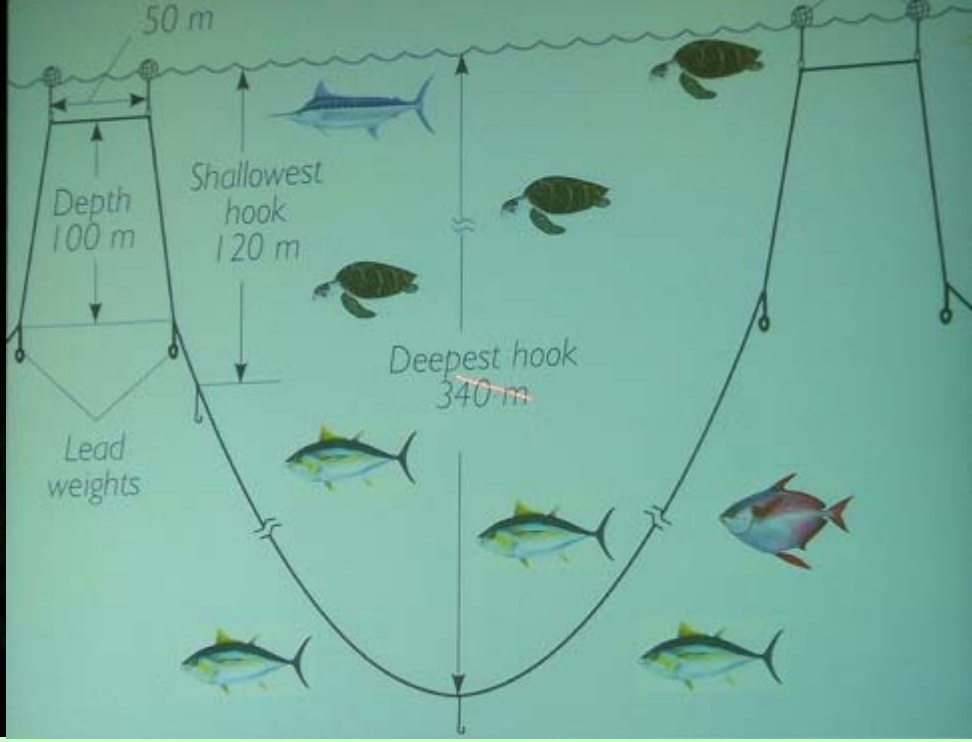
http://smartgear.org/

Smart Gear とは何か?

Building a future in which humans live in harmony with nature.



1st Year -Winner from South Pacific



2nd Year – Winner on Trawl warp for saving sea birds

FLYING BOTTLEBRUSH

A close view of the rope, which looks like a bottlebrush.
© Smart Gear / Chris Carey

3rd year on 2007 for "The Eliminator" to exclude trawl by-catch
© WWF / Smart Gear

2011 Winner: Yamazaki Double-Weight Branchline

Innovative Japanese Design to Reduce Seabird Bycatch Wins Both the Smart Gear 2011 Grand Prize, and the Tuna Prize

For the first time since the Smart Gear competition was established in 2005, a winning design, that reduces the accidental catch and related deaths of sea birds in tuna fisheries, has won more than one award.

Kazuhiro Yamazaki, a captain on a Japanese tuna vessel, is the 2011 Smart Gear winner, receiving a $30,000 grand prize, and also received the special tuna prize of $7,500, offered by the International Seafood Sustainability Foundation (ISSF)

The winning design – a double-weight branch line – sinks long line hooks beyond the range of seabirds, such as albatrosses and petrels, and reduces injuries and fatalities to crews caused by rapidly recoiling weights and hooks.

Results have been staggering. The device has proven to be safe and effective at reducing seabird bycatch in pelagic (tuna) longline fisheries. In 2010, over 95,000 branch lines with the Yamazaki double weight system were hauled with no injuries to fishermen, reducing seabird bycatch by 89% more than un-weighted branch lines, with no effect on fish catch rates.

How it works

The Yamazaki double-weight configuration consists of two leads placed at either end of a 1 to 1.5 meter section of wire or wire trace. This weighted section is inserted into a branchline 2 meters above the hook. The weight nearest the hook is free to slide along the branchline while the second lead is fixed.

The double weight reduces the danger of weight recoil injury to crew members by spreading the mass of the weights across the wire trace, as two smaller weights are better than one, and by including a sliding weight that dampens the speed at which the weight recoils.

The double weight system is also easier to handle on deck than a single weighted swivel – it is easier to coil and it prevents jackknifing as it is thrown into the water in line setting.

Double-Weight Branchline Fast Facts

When a research effort to find best practice seabird bycatch mitigation in the Japanese fleet fishing in the South Africa began, Kazuhiro Yamazaki, Fishing Master of the F/V Fukuseki Maru No 5, quickly emerged as the leader and innovator in this fleet.

The double weight system he conceived was in reaction to the need he saw to weight branchlines in a way that was safe and acceptable to Japanese fishing masters.

As a result, the simple and cost-effective device is proving to solve the seabird bycatch problem in tuna fisheries.

The results of which will ensure the sustainability of the tuna fishery and the livelihoods for fishing generations to come - all in a way where the catch of fish is a critical part of the solution.

2011 Runner-up: The SeaQualizer

Innovative Bycatch Release Device Wins $10,000 Award

The SeaQualizer is a noninvasive, pressure activated, fish recompression tool that is capable of releasing fish at targeted depths, and was awarded a $10,000 prize as runner-up in the 2011 Smart Gear competition.

The winning team, that comprises Bill Brown, Jeffery Liederman, Patrick Brown, and Ryan Brown from the Florida based company, Finovation Inc., came up with the idea for the SeaQualizer to address a significant problem in the management of some recreational fisheries - the mortality of bottom dwelling fish that are released at the surface as bycatch.

These fish have air bladders, and when they are brought to the oceans surface from depth they undergo barotrauma. This is when the fish cannot release the gas in the airbladder quickly enough to prevent expansion of the air bladder when brought to the surface on fishing gear.

Once released, with their air bladder expanded, the fish are unable to return to the original depth where they were captured, and as a result the mortality rate is very high.

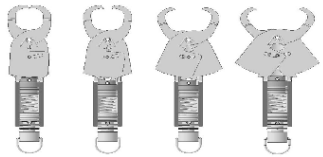


Diagram illustrating the SeaQualizer sequence of release

How the SeaQualizer works

The SeaQualizer works by non-invasively securing articulating jaws to a fish's lower lip, that has been caught at depth. To return the unintended catch, the reverse end of the mechanism is fastened to a weighted fishing line, via a long-line clip, that is then returned to a depth.

This provides adequate recompression so that when released, the fish can swim away with minimal buoyant force acting against it.

The device is triggered by a pressure differential at a specified depth. It reduces the time and effort for the angler to repeatedly reel heavy weights all the way up from the bottom.

SeaQualizer - Fast Facts

The SeaQualizer represents a breakthrough in bycatch release technology that could have a major impact on the management of recreational fishery mortality.

This pressure activated, fish recompression tool can accommodate the release of many species of fish, both large and small. Large species of fish, such as the Warsaw or Goliath Grouper require a significant amount of weight to overcome the resultant buoyant force while small species of fish require a compact profile to accommodate their small mouths.

Although several techniques have been introduced to mitigate this bycatch mortality, none are widely used in many recreational fisheries and others have not proven to be effective.

2011 Runner-up: Turtle Lights for Gillnets

Design to Reduce Turtle Bycatch Wins $10,000 Award

Coastal gillnet fisheries are one of the most common forms of fishing throughout the world and have been associated with significant sea turtle bycatch rates. In Baja California, Mexico, investigations have reported 800 loggerhead turtle interactions in coastal gillnets from one fishery in a year, while fisheries off the coast of Northern Peru have reported interactions with over 300 green sea turtles.

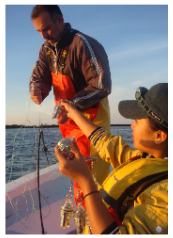
In response to this increasing challenge of bycatch, Shara Fisler, from the Ocean Discovery Institute in San Diego, and John Wang, from the University of Hawaii, examined the behavioral and physiological studies, that show found visual cues play important roles in sea turtle foraging and orientation. By investigating potential visual based strategies as a way to reduce sea turtle interactions with gillnet fisheries, the team developed the award winning design 'Turtle Lights for Gillnets'.

Using widely available fishing lights (LED or chemical lightsticks) to illuminate gillnets, the design creates enough of a warning signal to alert sea turtles to the presence of a barrier, allowing them to avoid it. Experiments with illuminated nets were conducted in Baja California, and the trials reduced green turtle bycatch by 60% without affecting the fishery target catch rates or catch value.

Lights attached to the nets create enough of a warning to alert sea turtles to a barrier

The long-standing innovative approach by this team has also resulted in the formation of the Bycatch Mitigation Research Program, helping to develop students as future leaders in fisheries management and marine conservation, while examining new bycatch reduction technologies.

Research into the turtle lights for gillnets design has continued to support opportunities for a science-focused education experience of students, to explore ocean conservation concepts, develop quantitative skills, and conduct critical marine research alongside fishermen, scientists, and fishery managers.



Attaching LED lightsticks to a bottomset gillnet

Turtle Lights for Gillnets - Fast Facts

Innovative design uses widely available fishing lights (LED or chemical lightsticks) to illuminate gillnets.

Experiments were conducted in Baja California, but can be adapted in any coastal gillnet fishery.

During the trials several different lightsticks were tested, and placement along the floatline of the gillnet differed.

Results from trials in Baja California indicated a 60% reduction in green turtle bycatch.

The use of lightsticks to illuminate gillnets in order to reduce sea turtle bycatch has not been tested in gillnets fisheries prior to this research and is a creative use of a widely available product.

The Turtle Lights for Gillnets and their ability to reduce the bycatch of turtles has the potential to be an effective device for turtle conservation all over the world.

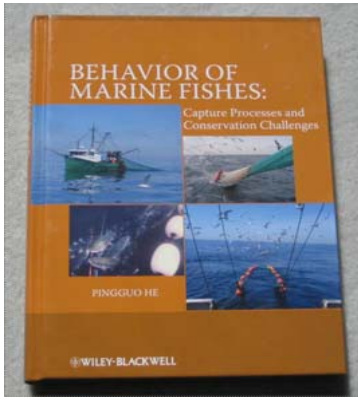
現代の水産学（1994）Ⅰ-2　漁法と魚群行動学

- 漁法学の始まり
- 魚群行動学の確立
- 魚群行動の水槽実験
- 漁法研究の流れ
- 刺激－反応系に基づいた行動研究
- 漁具に対する魚群行動の水中観察
- 行動生理学の導入と魚群制御論への道

さまざまな研究手法

問題は現場にあり，解決策も現場にある。

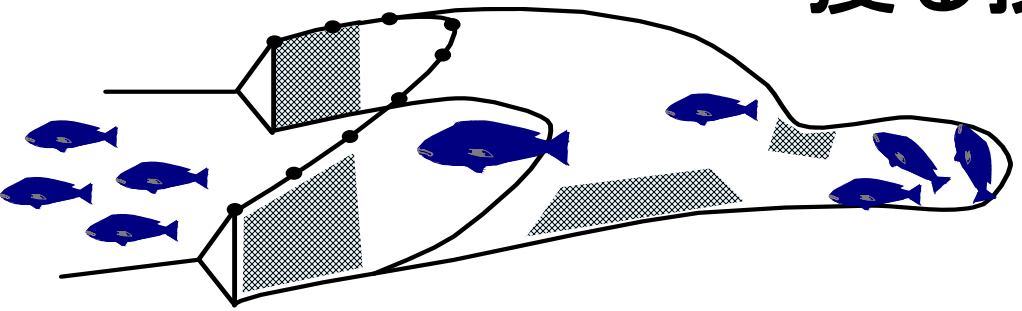
- 魚の行動と漁法（井上　実，1978）
- 漁具と魚の行動（井上　実，1985）
- Marine Fish Behaviour in Capture and Abundance Estimation (1995)
- 魚の行動生理学と漁法（1996）
- Behavior of Marine Fishes (2010)
  - Capture Processes and Conservation Challenges
  - Swimming , Fish Vision, Hearing
  - Trawls, Longlines, Fish Pots, Large-scale Traps, Gillnets, Electric sense
  - Technical measures to reduce bycatch and discards in trawl fisheries
  - Mortality of animals that escape fishing gears or are discarded after capture: Approaches to reduce mortality
  - Effect of trawling on the seabed and mitigation measures to reduce impact
  - Measures to reduce interactions of marine megafauna with fishing operations

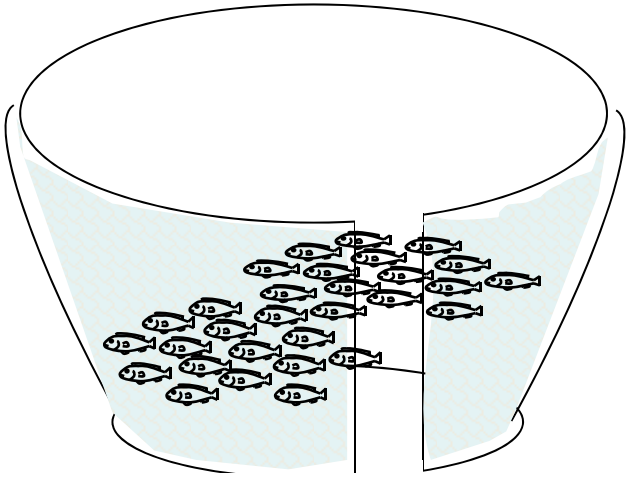


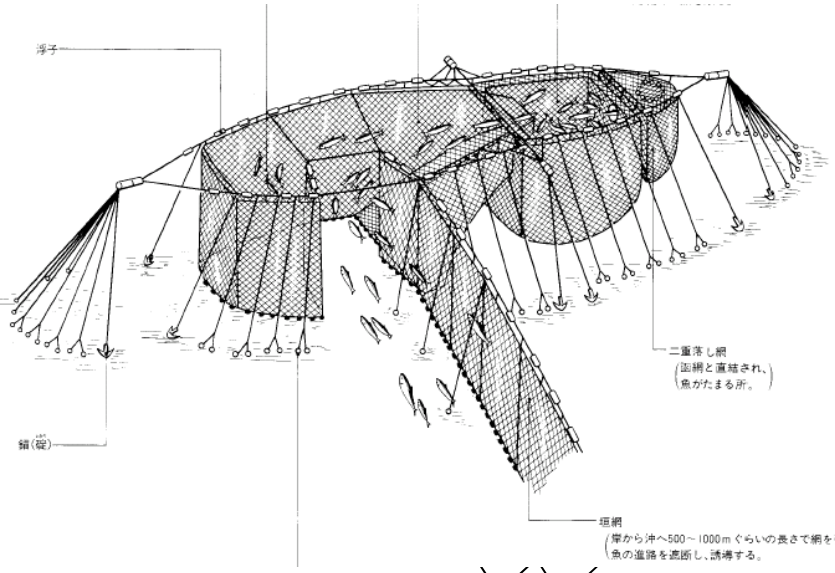
漁獲過程の解明

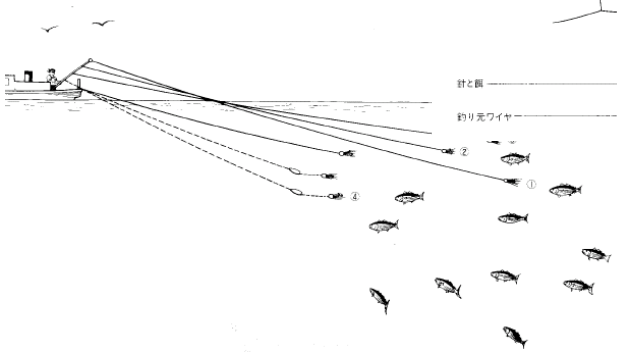
- 漁場環境･魚群の特性
- 漁具の水中の構造･挙動　～　漁獲機能
- 漁具に対する対象生物の反応
  - 行動の機構
  - 生理学的な背景：漁具認知と回避

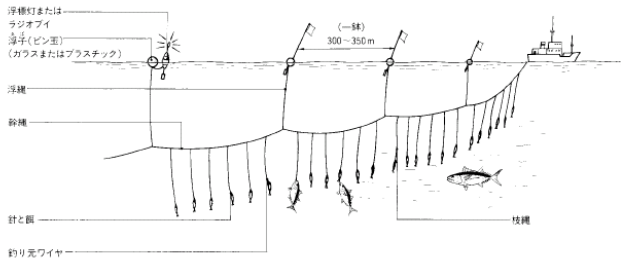
獲る技術

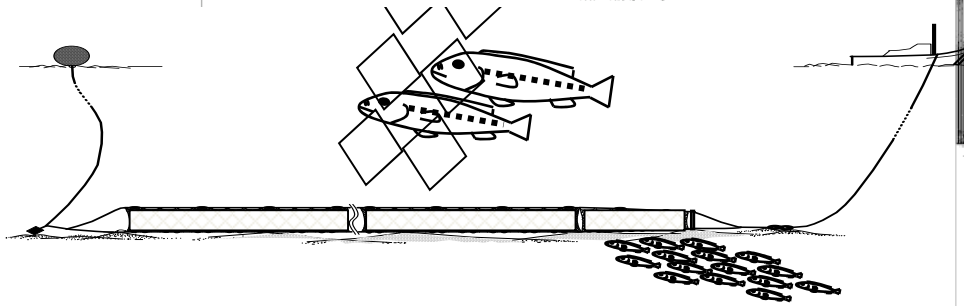


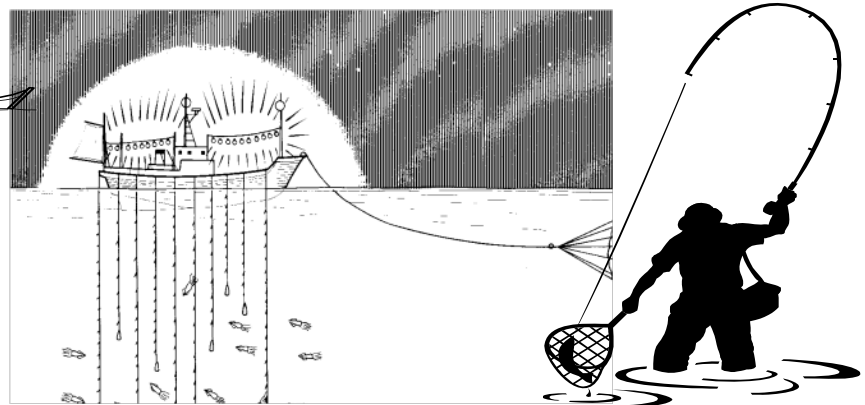



浮子
二重落し網
(面綱と直結され、
魚がたまる所。)
錨(碇)
垣網
(岸から沖へ500～1000ｍぐらいの長さで網を張
魚の進路を遮断し、誘導する。)




浮標灯または
ラジオブイ
浮子(ビン玉)
(ガラスまたはプラスチック)
浮綱
(一鉢)
300～350ｍ
幹縄
針と餌
釣り元ワイヤー
枝縄





漁業の技術

探魚

- 漁場選定：漁場学，水産海洋学，漁業情報学
- 魚群探索：目視，兆候，計測器

集魚

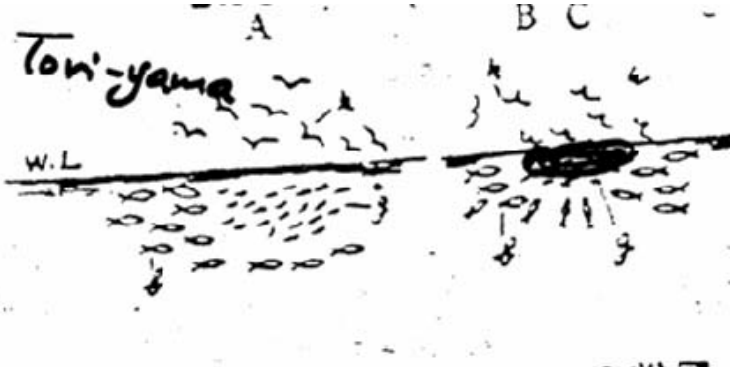
- 長期集魚：漁場造成，環境修復
- 間接漁法（行動制御）：威嚇，誘導，遮断，陥穽

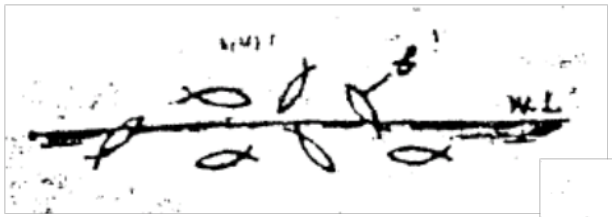
漁獲

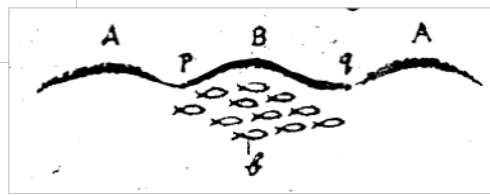
- 漁具の分類：網漁具，釣漁具，その他の漁具
  能動漁具，受動漁具
- 直接漁法：刺突，拘引，狭捩，剥爬，掬抄，羅網，吸引，麻痺

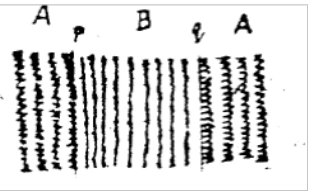
探魚の技術：カツオの群れ

- 素なむら
- 付き群れ
  - クジラ付き，サメ付き，木付き，イワシ付き
  - 鳥付き
- トロミ
- 餌床（エドコ）
- 銀流し
- ヒキ
- 跳ね
- 水押し
- 白湧き





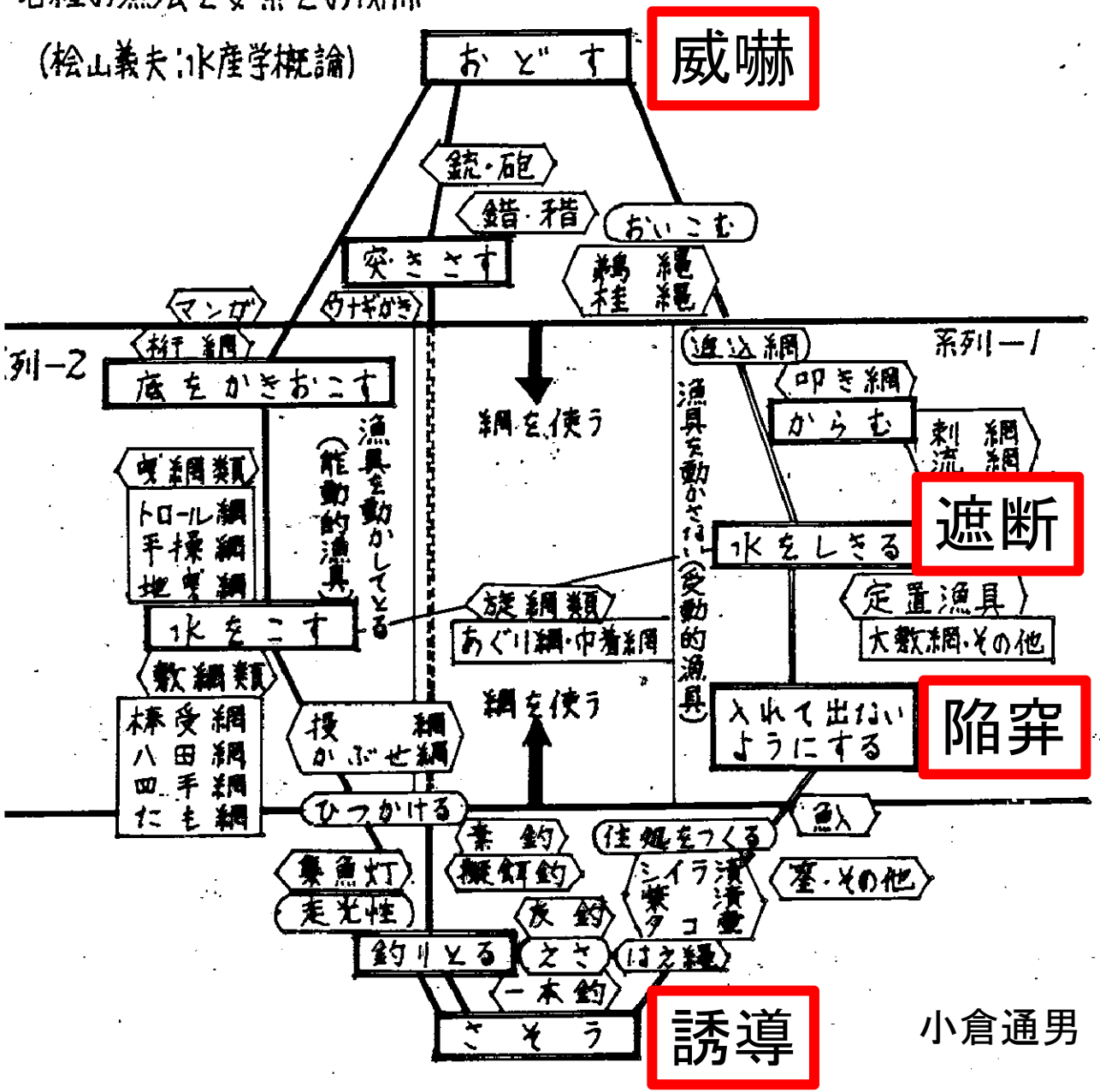




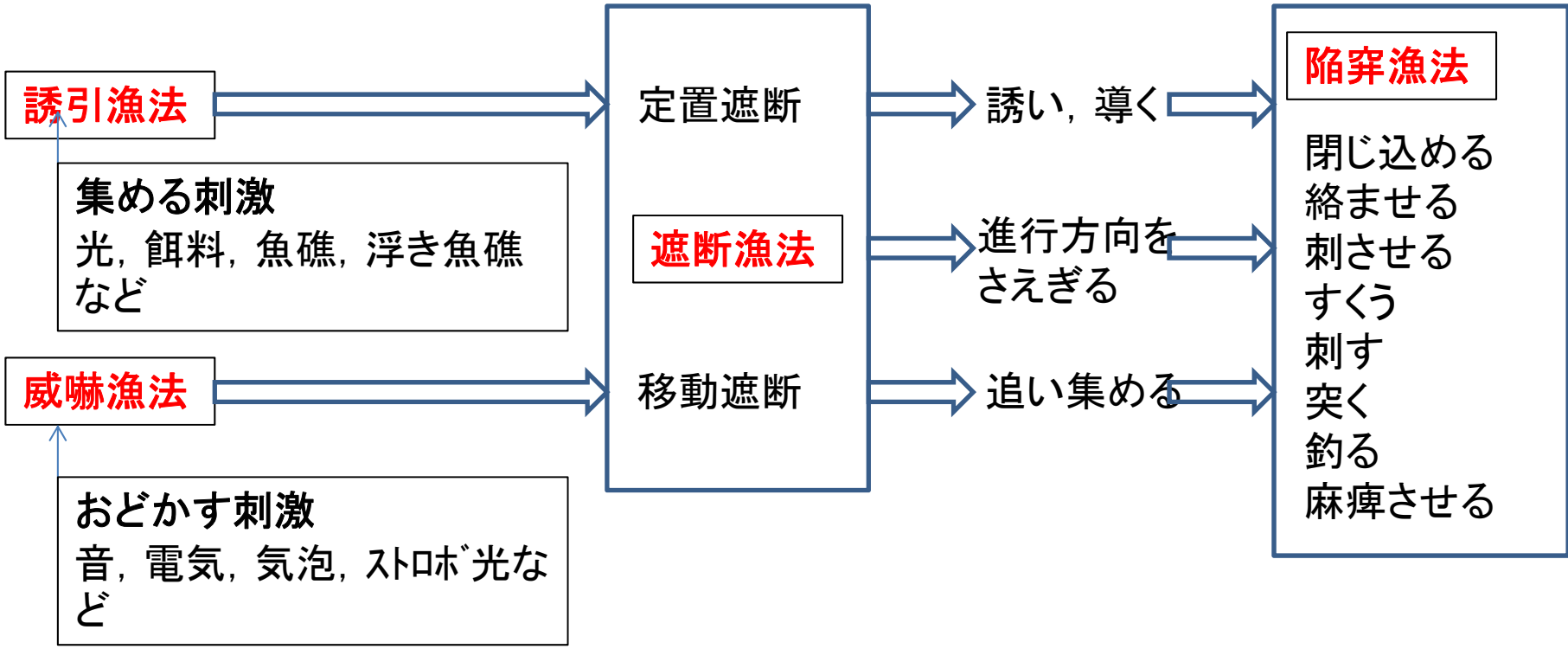
漁法学：2. 漁法の要素

各種の漁法と要素との関係

（桧山義夫：水産学概論）

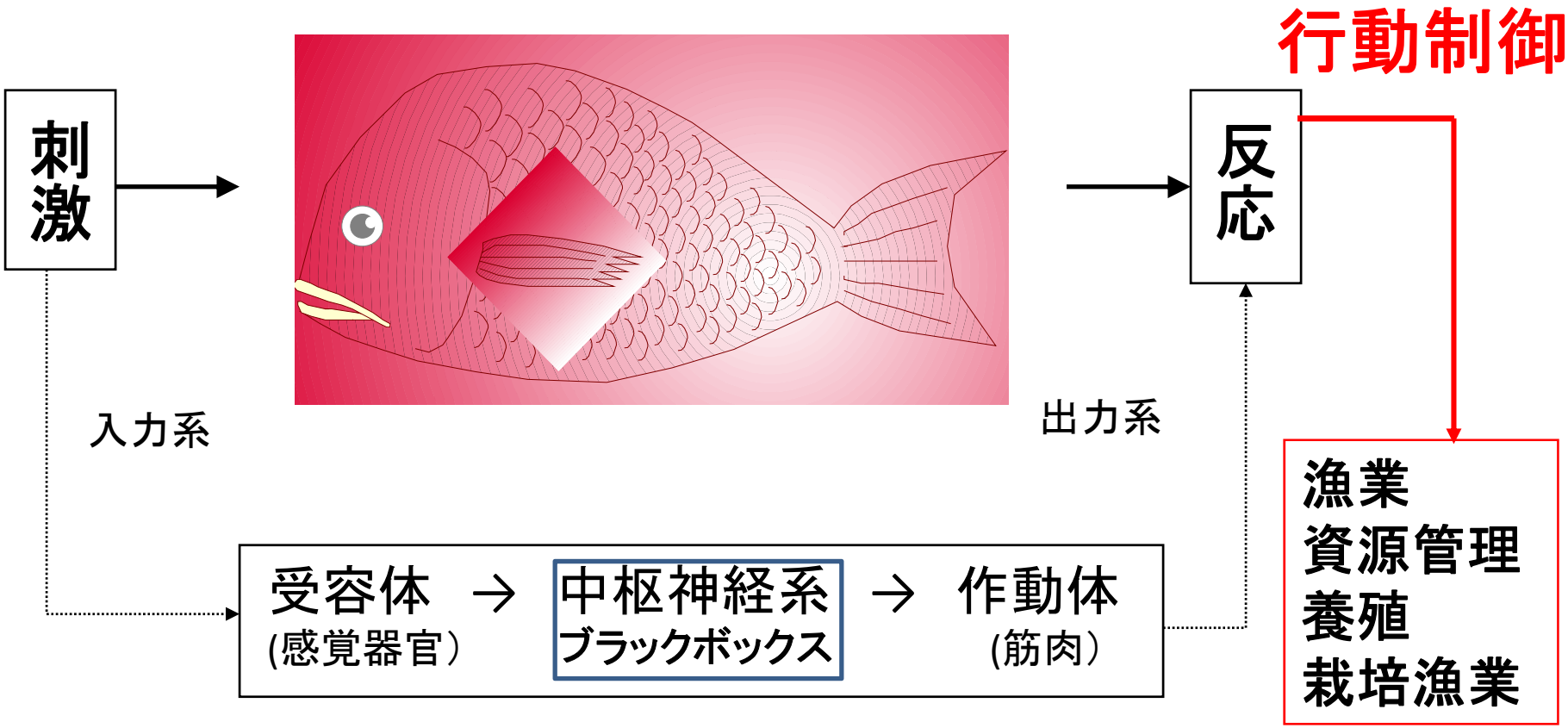


小倉通男　1975　講義ノート



漁獲のための行動制御の技術要素

刺激ー反応系の入力･出力システム



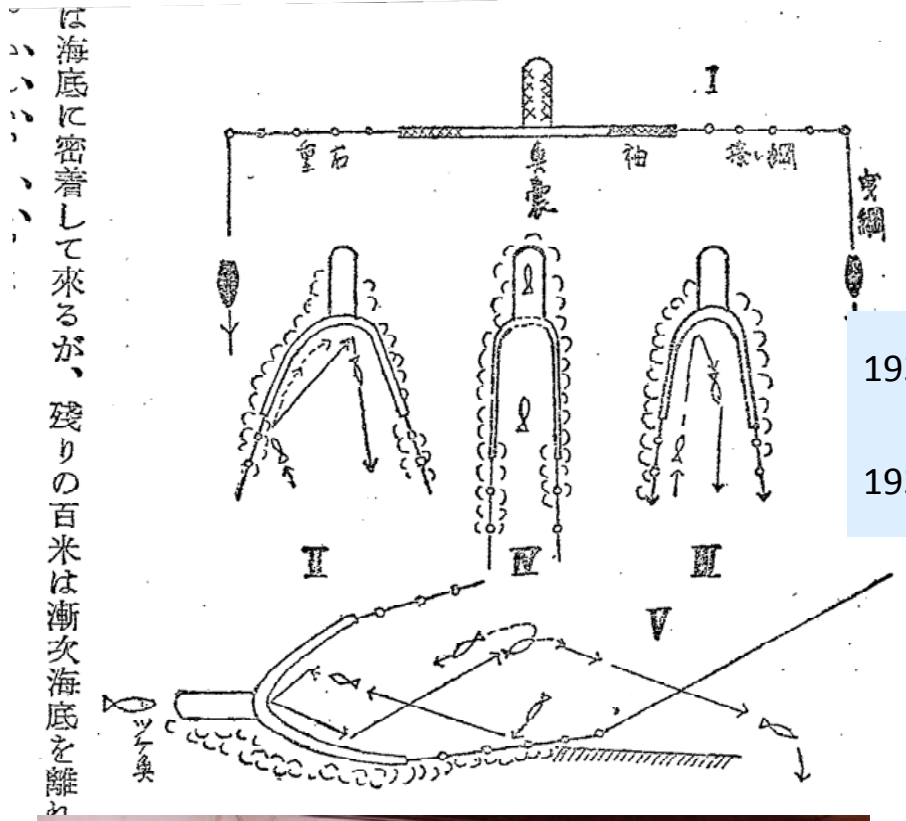
ブラックボックス

水中観察の技術

魚の国（1938）三浦定之助

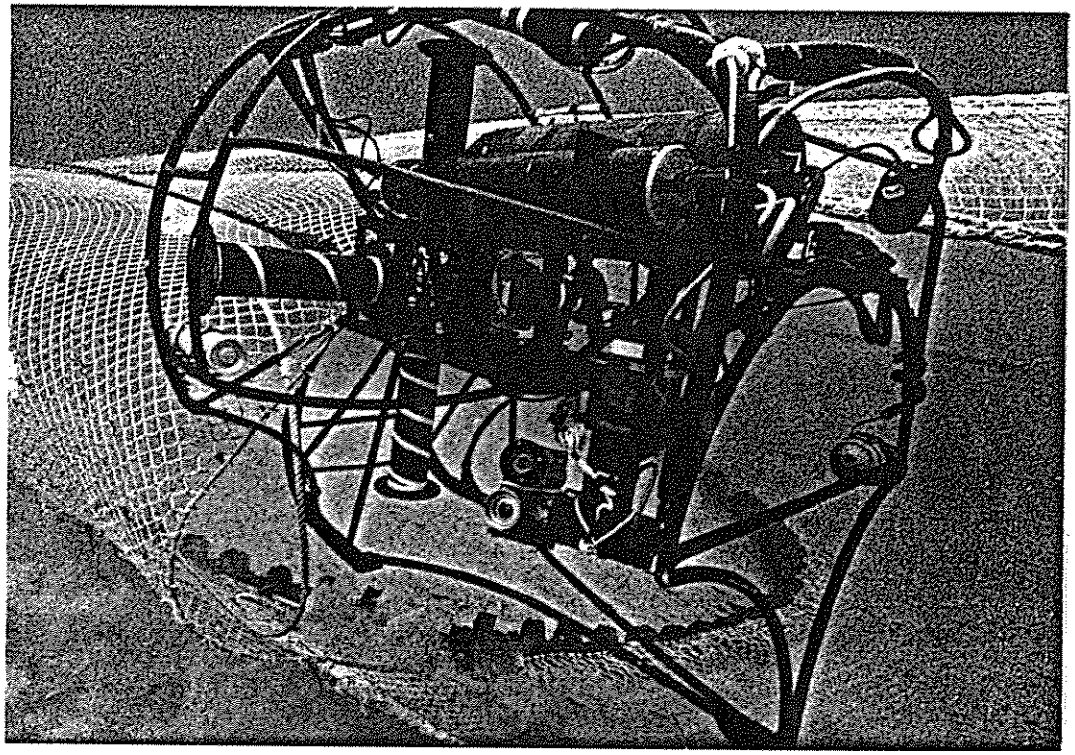
1930　・三浦定之助、定置網調査に潜水器を取り入れる。

1933　・三浦定之助、水深45mの水中写真の撮影に成功。



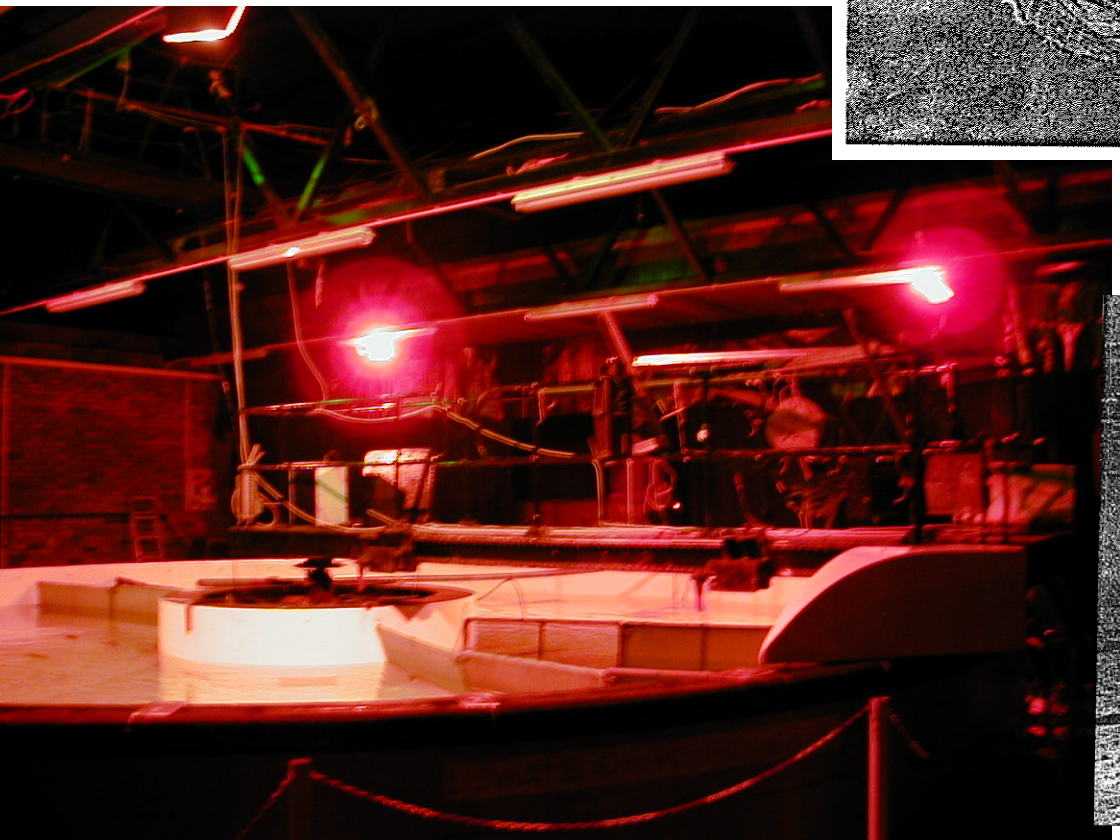
洋野町立種市歴史民俗資料館　**南部もぐり**

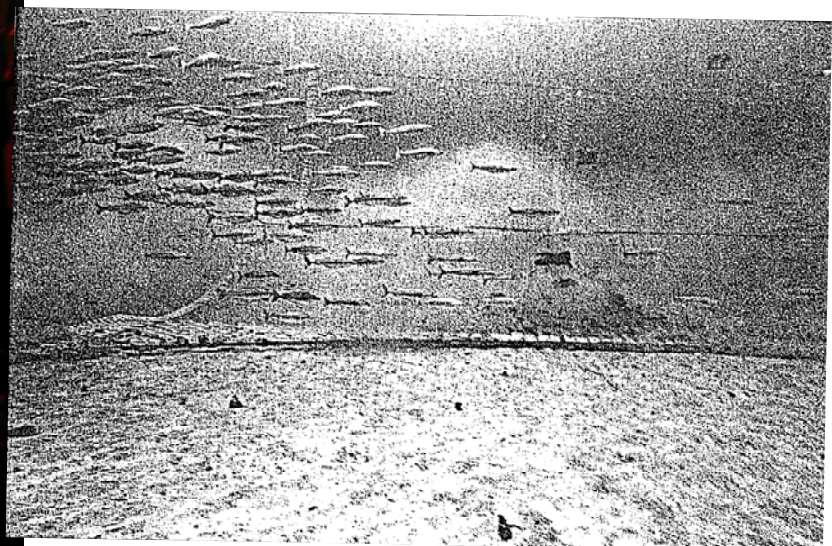
Aberdeen Marine Laboratory



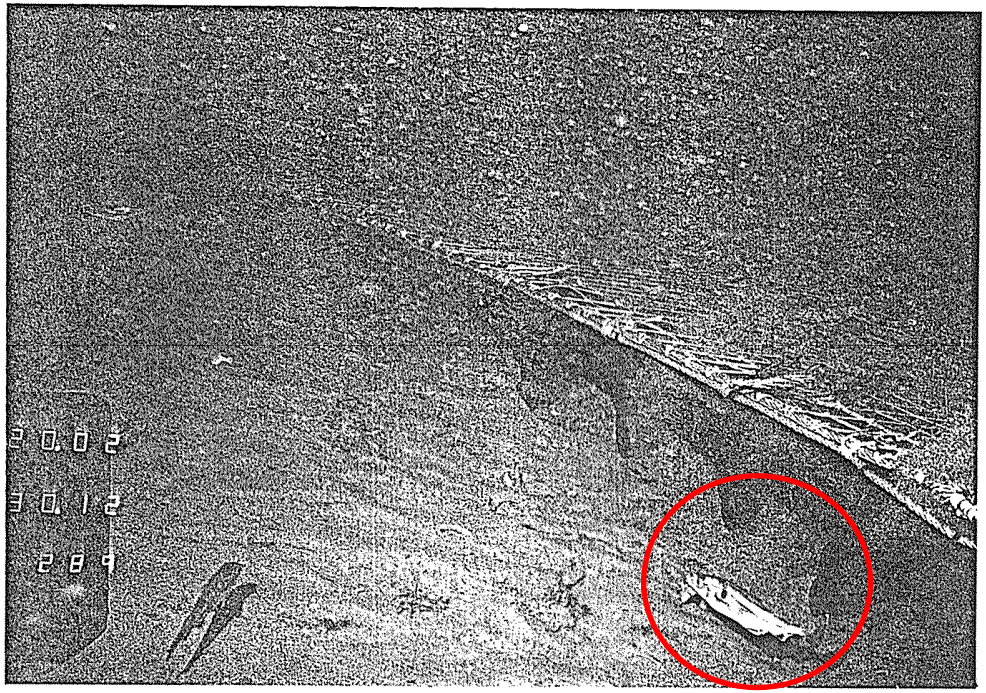
水中曳航ビデオ

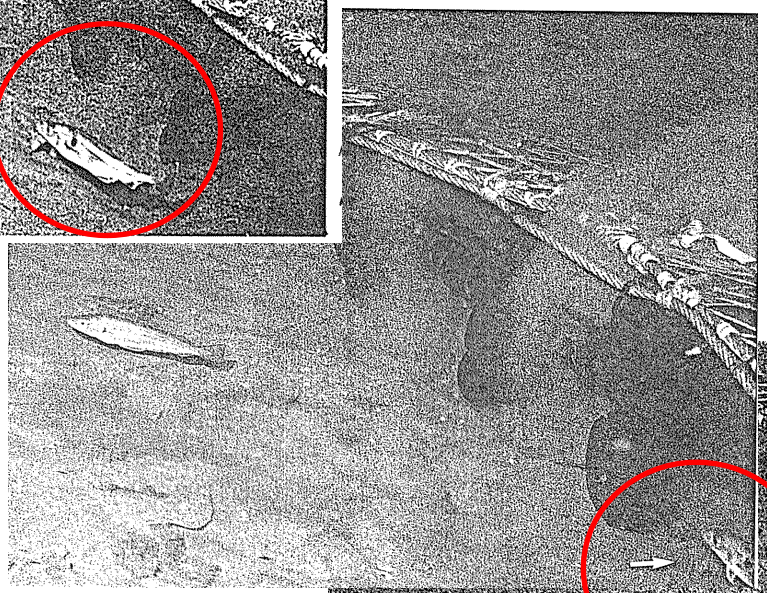
10m円形水路　Gantry Tank

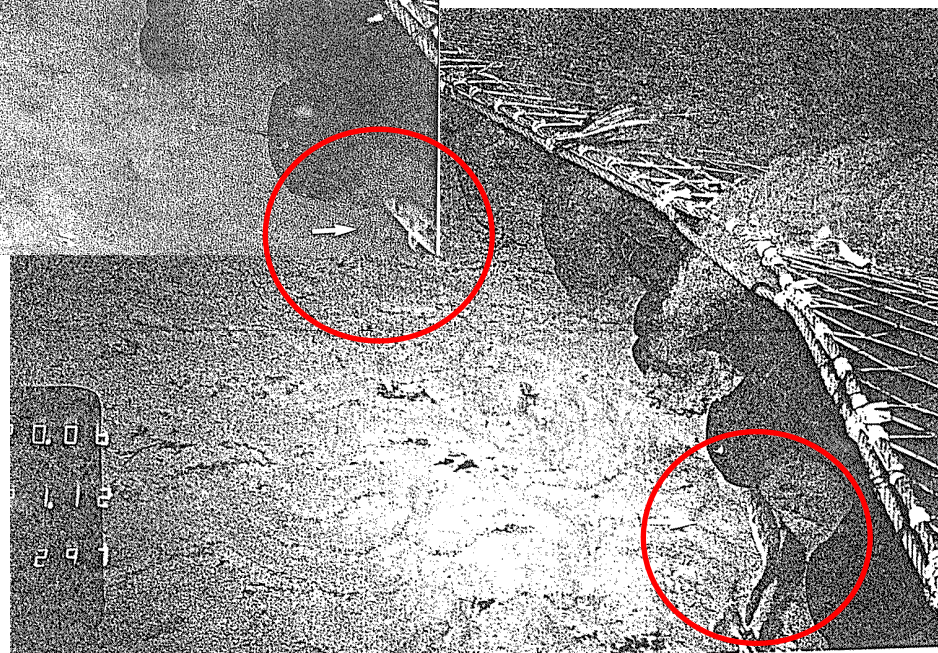




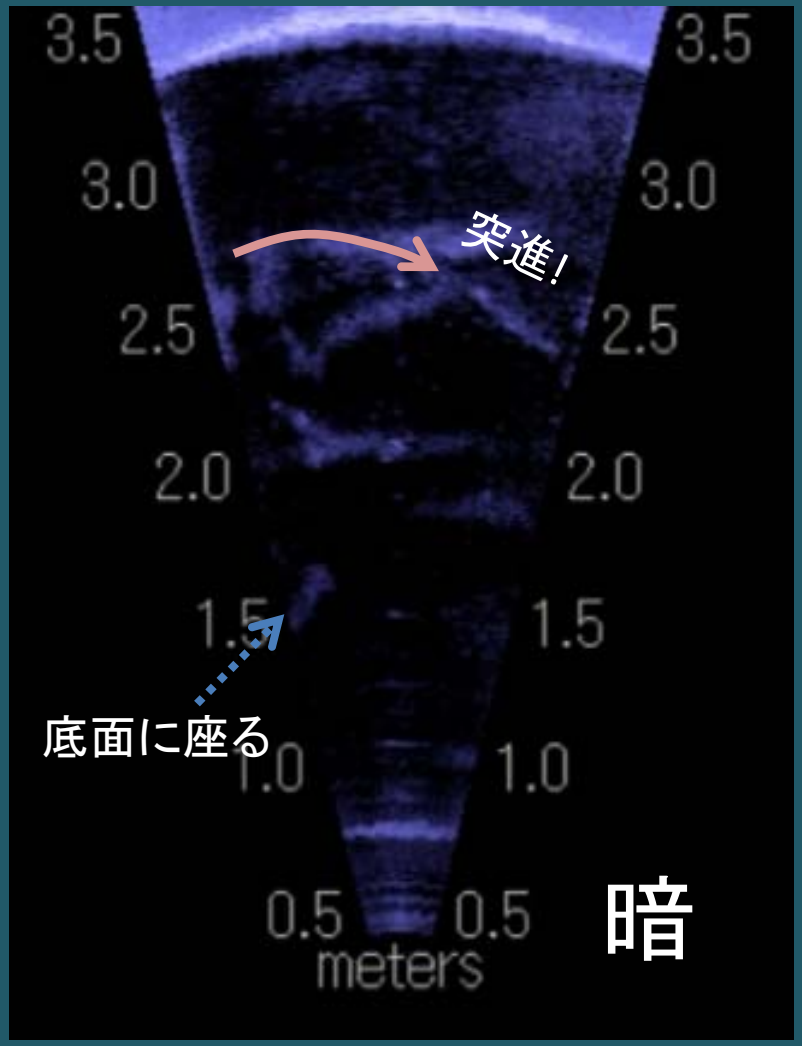
トロール網口での夜間の魚群の反応



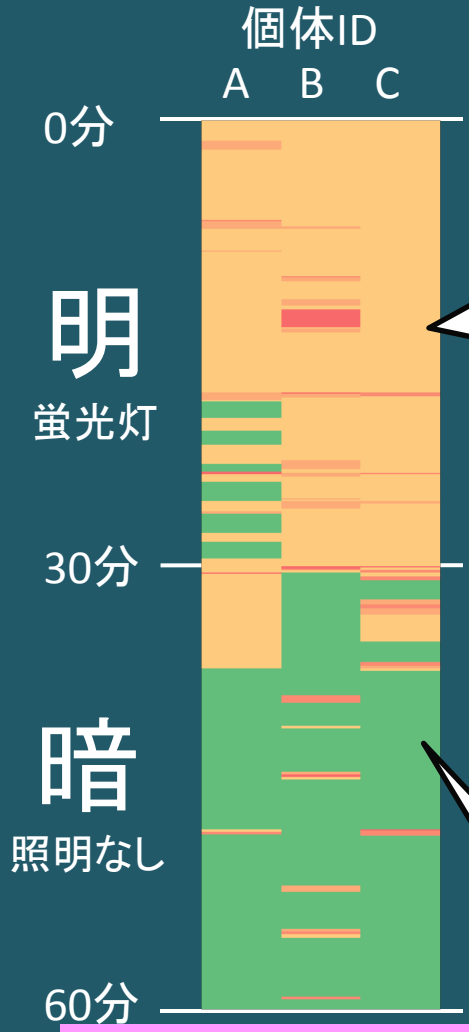




結果：行動観察による手法･･･暗環境下での行動の特徴



音響カメラにより明/暗
環境下での行動を比較



光量子束密度
(水面直上)
0.912
μmol･m^{-2}･s^{-1}

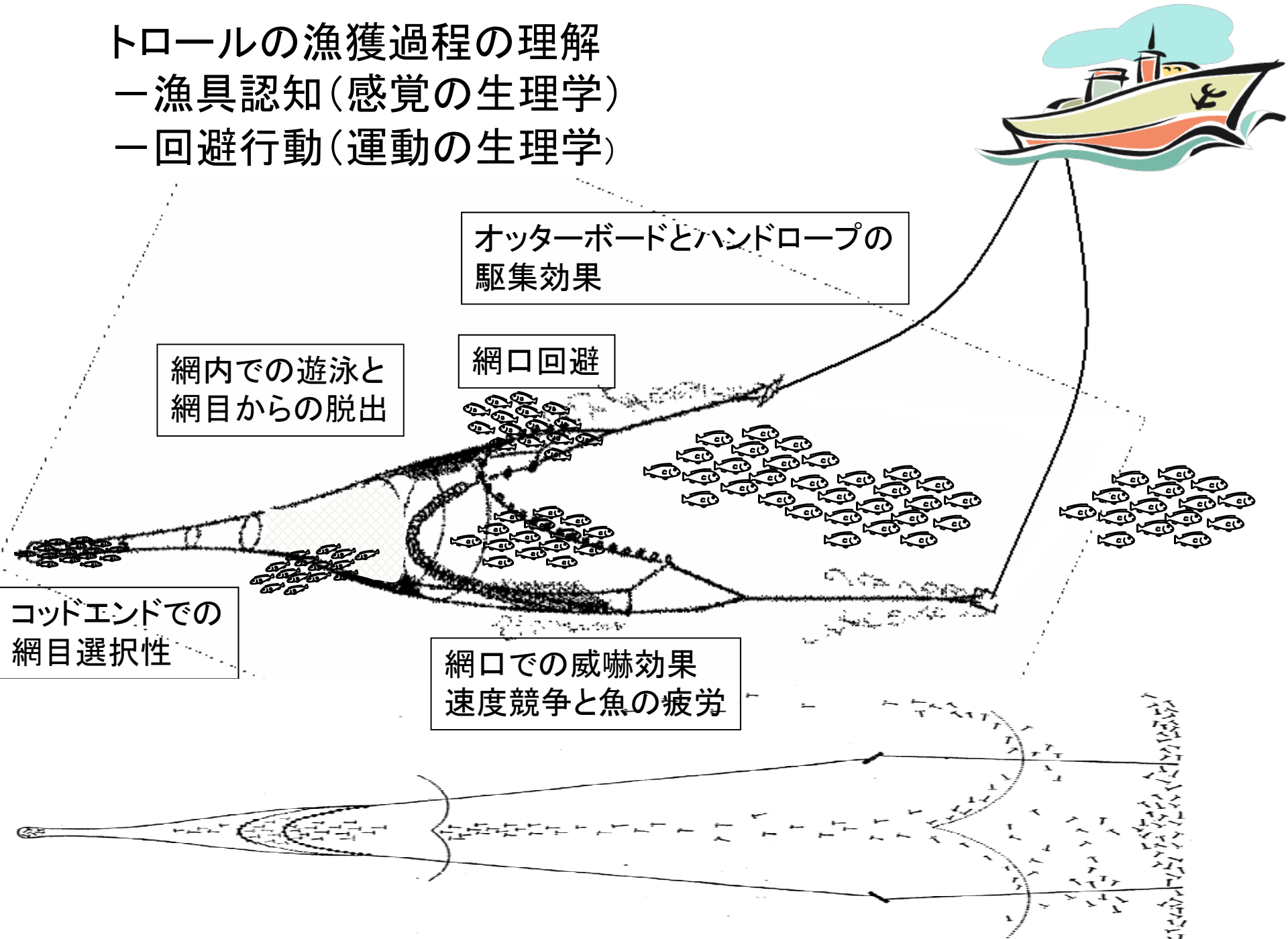
⑤突進！
④遊泳
③繰り返し接触
②ホバリング
①座る

≒0
μmol･m^{-2}･s^{-1}
(計測不能)

視覚が十分作用しないときには
・底面へ座る行動
・壁面への衝突　が起こる

(水産工学研究所　高山　剛)

トロールの漁獲過程の理解
ー漁具認知（感覚の生理学）
ー回避行動（運動の生理学）



漁獲過程の解明　⇒　漁獲選択性向上

- 選択部位と出会う確率

- 機械的な選択　Mechanical Selection
  - 網目の大きさ *vs* 魚体の大きさ (魚体胴周長)
  - グリッドの隙間 *vs* 魚体の大きさ (幅／高さ)
- 行動特性を利用した選択
  Behavioural Selection
  - 漁具の認知と回避

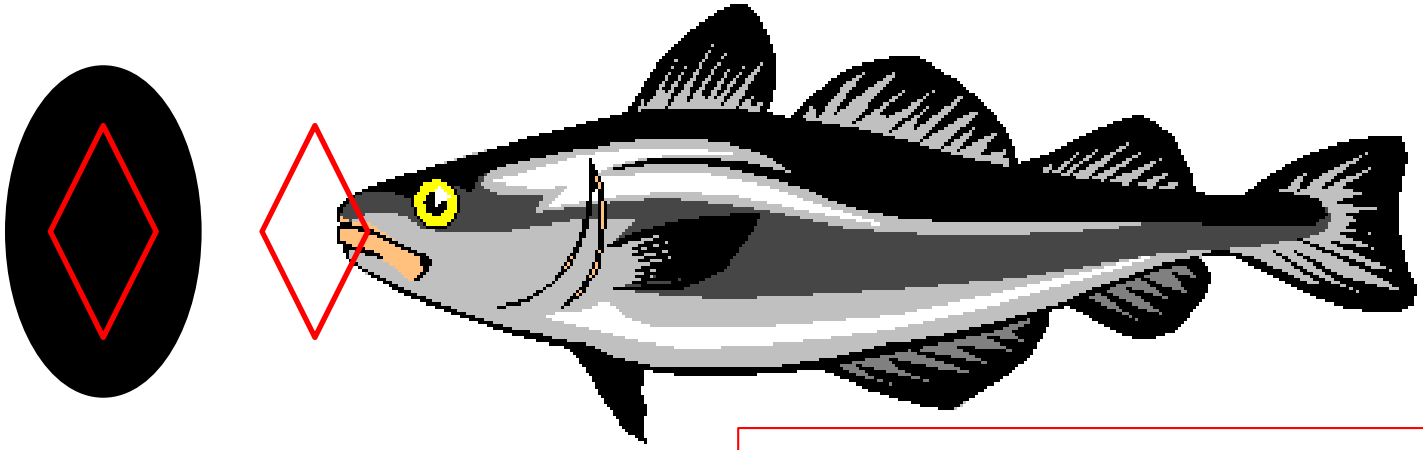
漁具改良　Gear modification

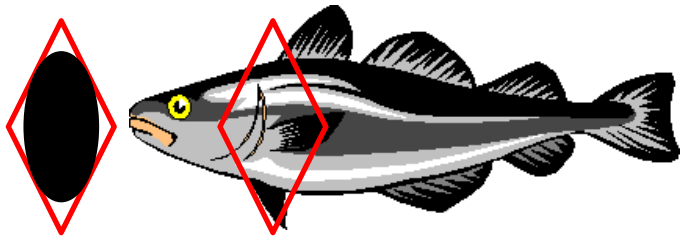
網目の選択性を調べるために
カバーネット（覆い網）

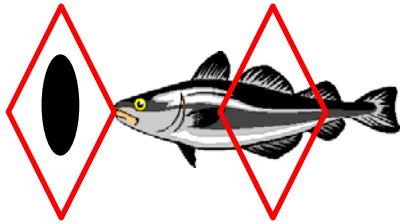
Codend

Cover Net

ダブルコッドエンド（双胴網）

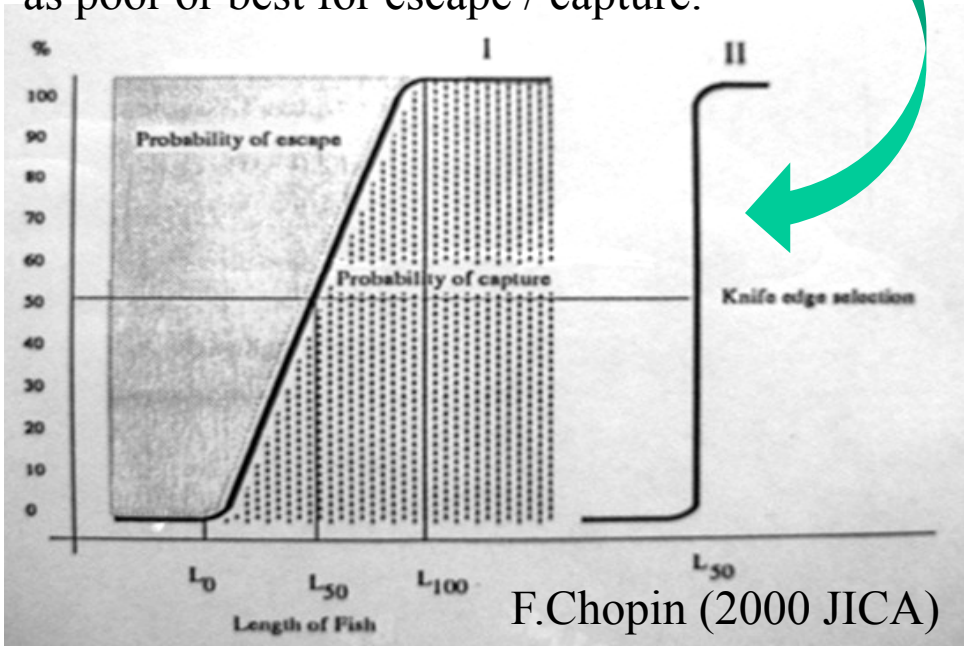






The best selective function, but rarely happens!
Scientifically correct, but **Technically in-correct** for purse seine and trawl for gilling to kill!.

Selectivity performance can be examined, as poor or best for escape / capture.



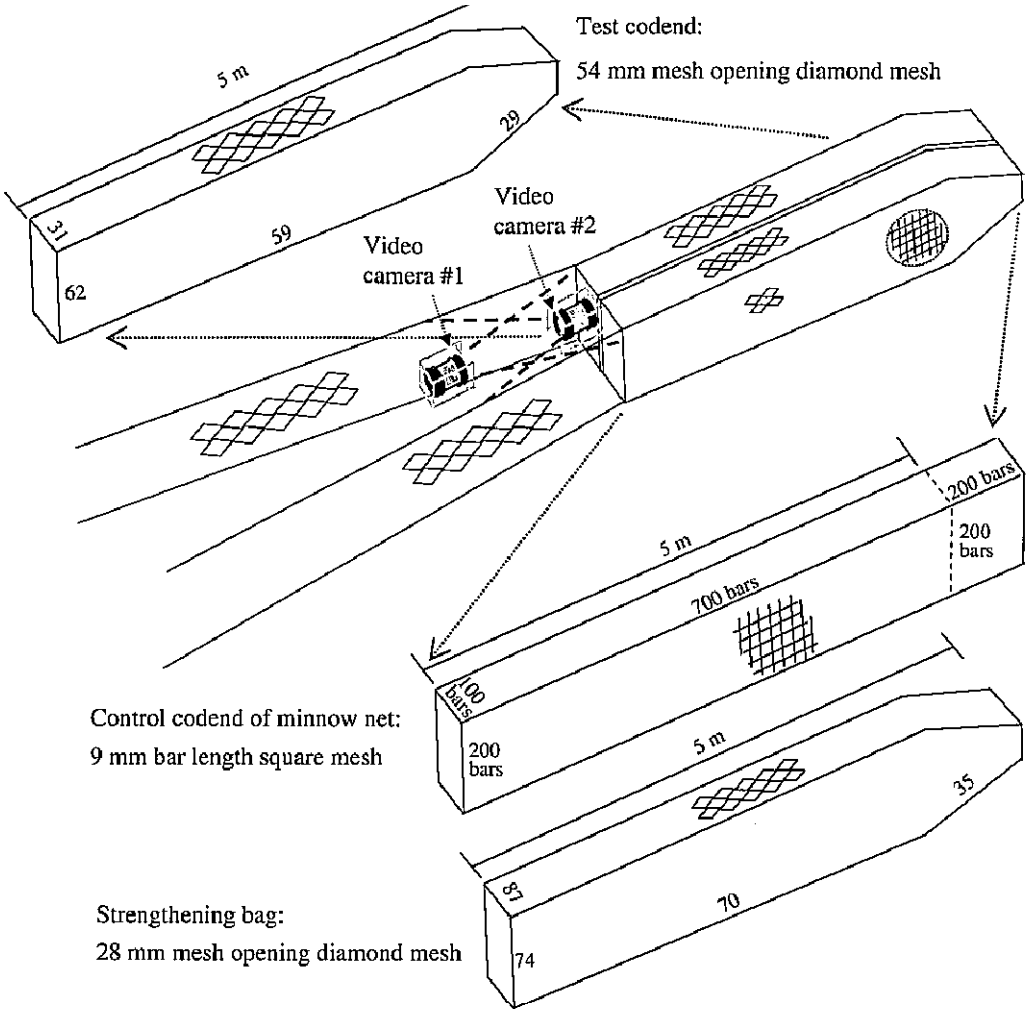
F.Chopin (2000 JICA)

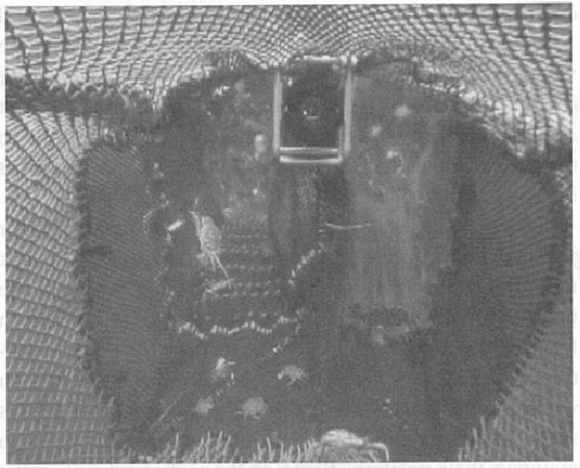
選択性曲線

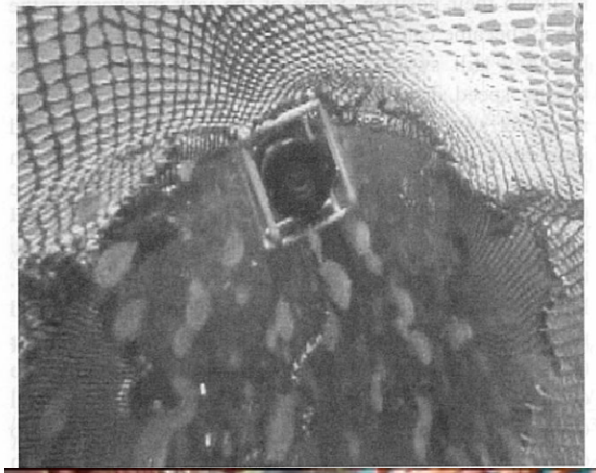
Codend selectivity for jack mackerel and whitefin jack and unequal split parameter estimates observed in trouser trawl experiments

Confirmation needed for equal separating

Takafumi Arimoto · Tadashi Tokai







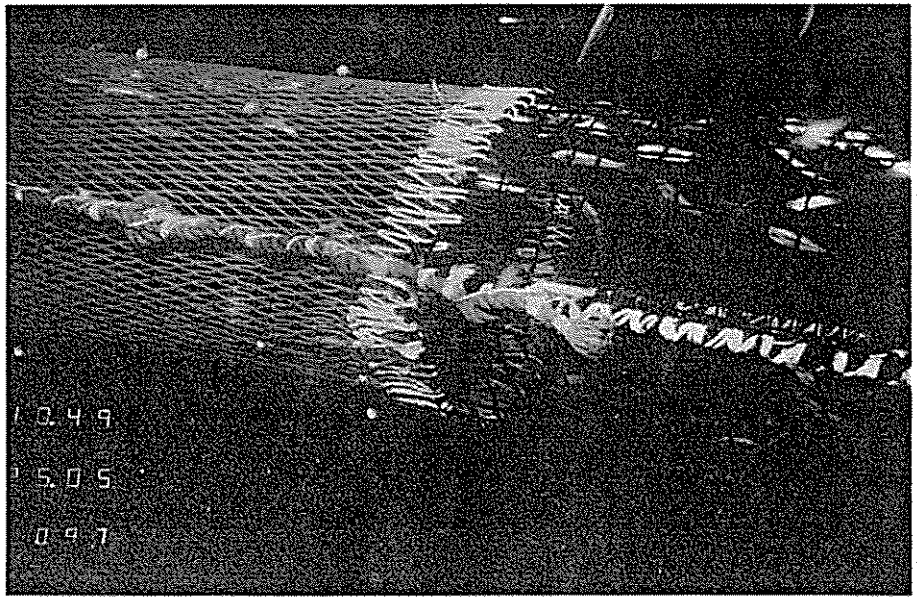
Underwater video for trawl net

Differed swimming performance inside the net

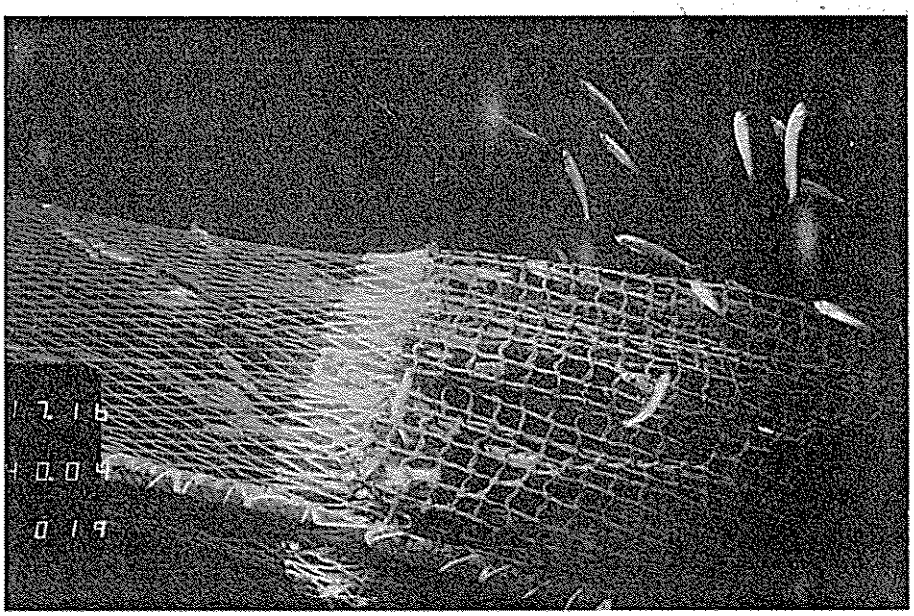
Video recording at codhead viewing codend
Shells, crabs, squid, whitefin jack and jack mackerel

Jack mackerel struggling to swim with net

菱目網

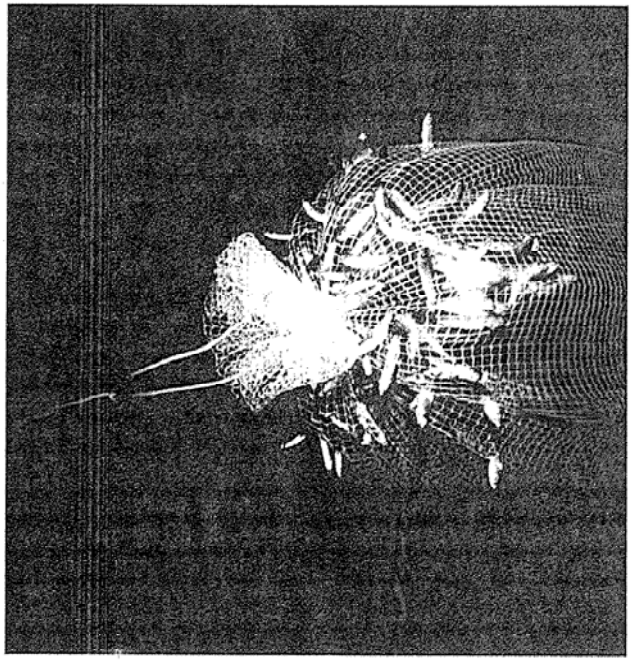


角目網



Conservation of young fish by management of trawl selectivity

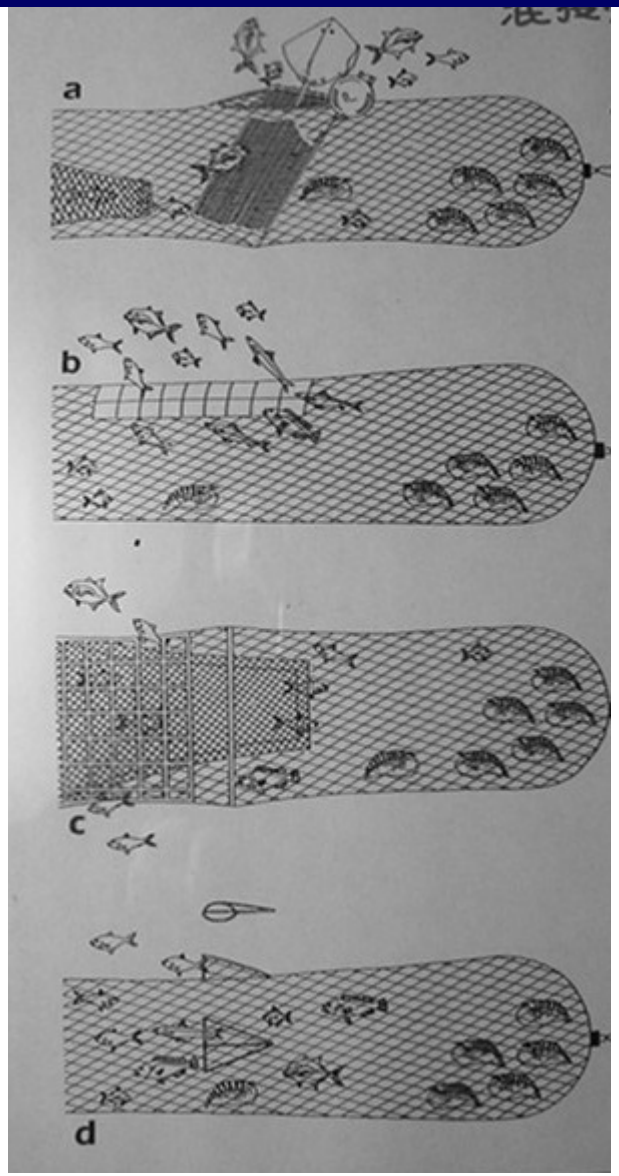
Petri Suuronen

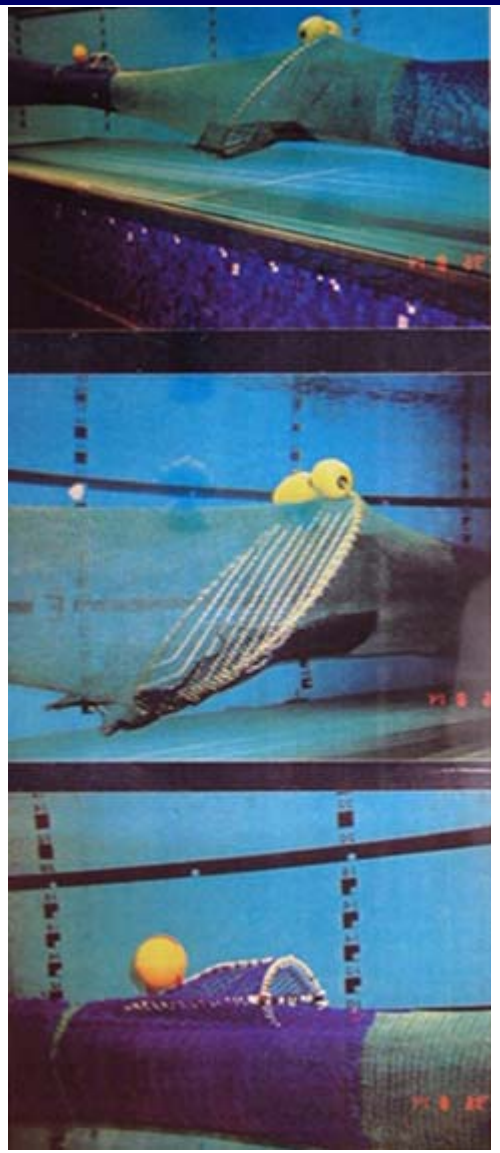


Helsinki 1995

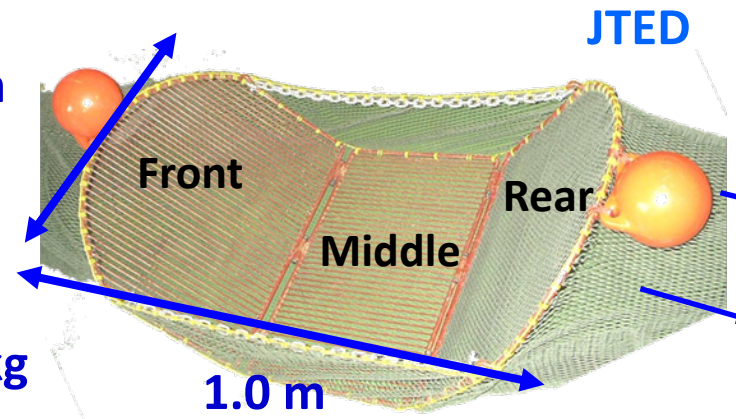
混獲投棄を減らすための装置

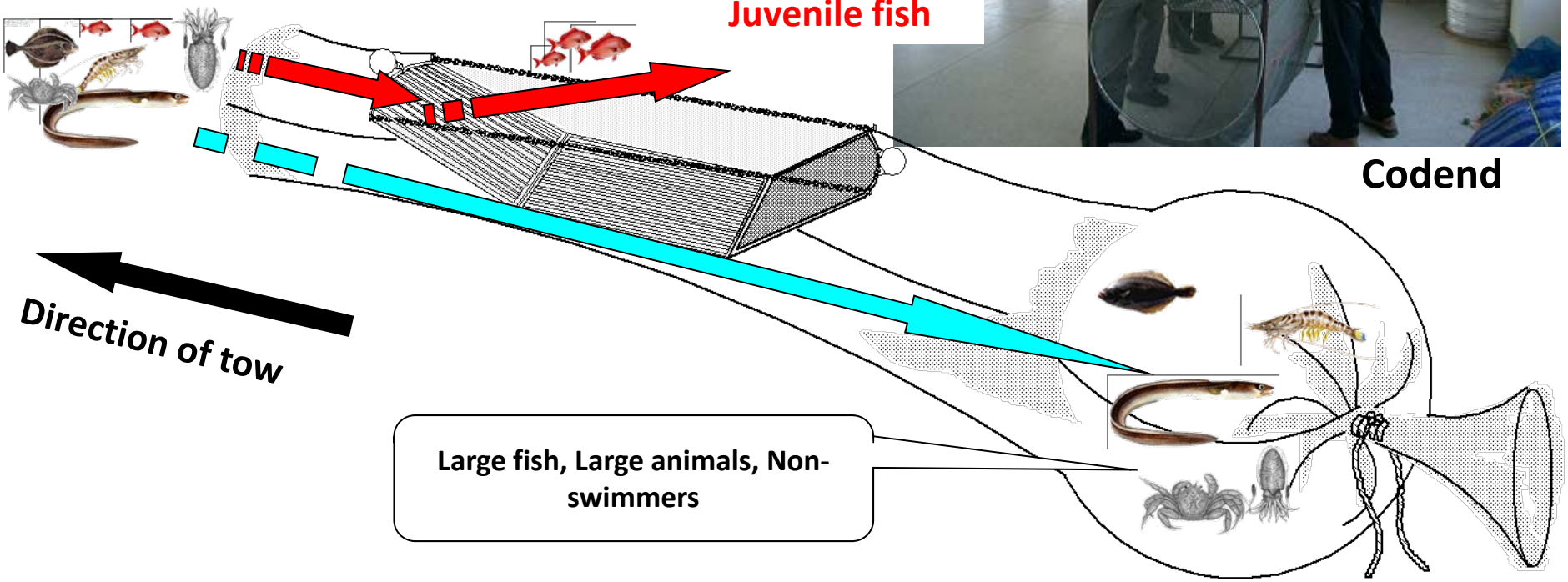
By-catch Reduction Devices for Trawl Codend



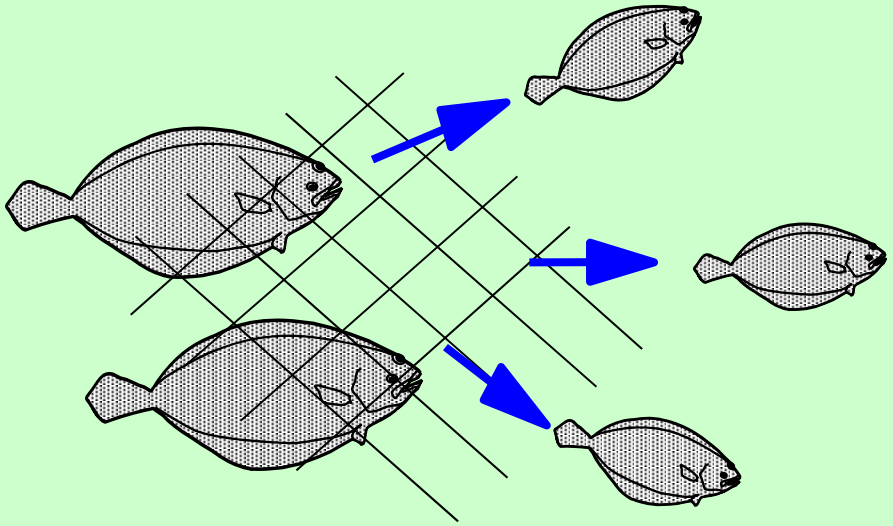


JTED (Juvenile and Trash Excluder Device)

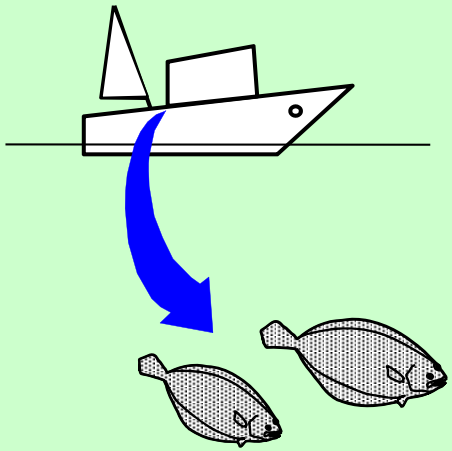




生残性向上のために

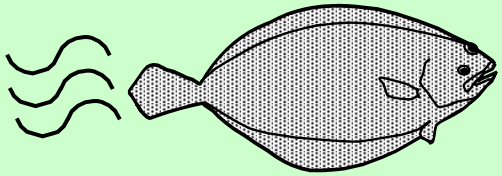


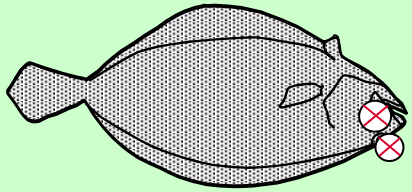
網目選択性



船上放流

SURVIVE?





DEAD?

COP10の閉幕を宣言する松本龍
環境大臣（10月30日・名古屋）

Selective Fishing and Balanced Exploitation in Relation to Fisheries and Ecosystem Sustainability
Nagoya (Japan) 14-16 October 2010

(1)
Defining and measuring selectivity in an ecosystem perspective, beyond gear technology;

(2)
Effects of selective vs balanced exploitation on within-species and community properties: available theoretical results and empirical evidence;

(3)
Economic and social aspects of fishing selectivity;

FEG

A workshop organized by the IUCN-CEM Fisheries Expert Group (FEG) and EBCD

Selective Fishing *vs* Balanced Exploitation ????

Question :
conventional '**improved selectivity**' paradigm against **ecosystem approach** to fisheries

Targeting large sizes generates more disturbance than targeting small ones or fishing the whole size spectrum

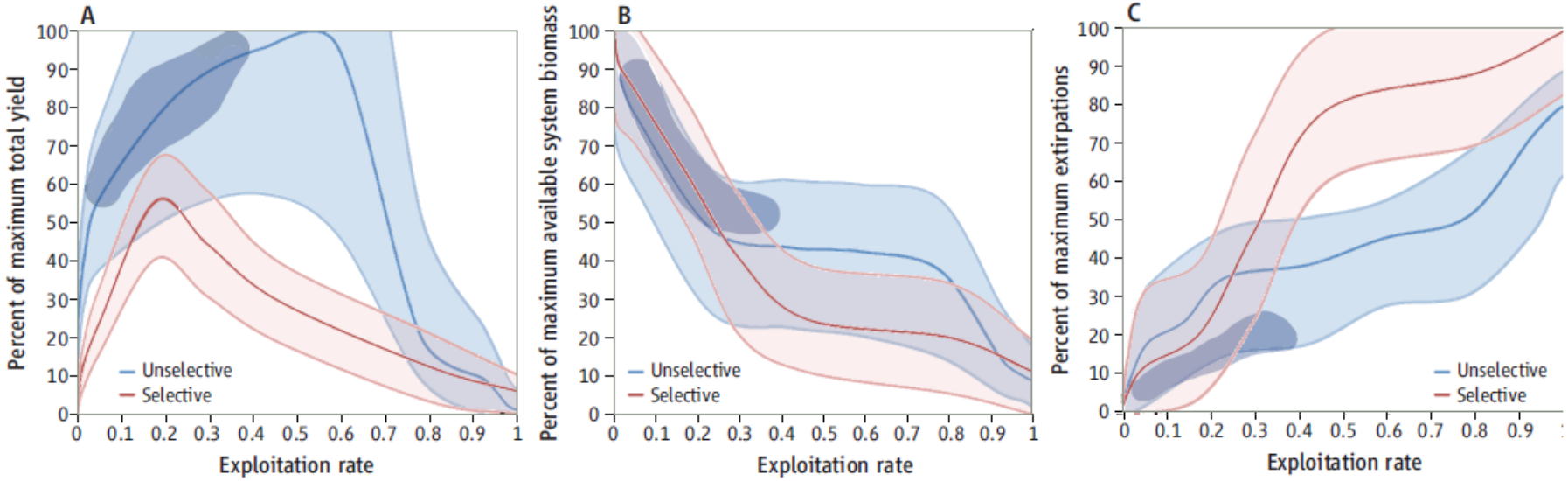
High fishing pressure on adults has also been predicted to drive stocks to evolve towards life-history strategies that can sustain higher fishing pressures by earlier maturation and smaller adult body size.

Reconsidering the Consequences of Selective Fisheries

S. M. Garcia, J. Kolding, J. Rice, M.-J. Rochet, S. Zhou, T. Arimoto, J. E. Beyer, L. Borges, A. Bundy, D. Dunn, E. A. Fulton, M. Hall, M. Heino, R. Law, M. Makino, A. D. Rijnsdorp, F. Simard, A. D. M. Smith POLICY

POLICY FORUM *Downloaded from www.sciencemag.org on March 2, 2012* **VOL 335**

Balanced fishing across a range of species, stocks, and sizes could mitigate adverse effects and address food security better than increased selectivity.



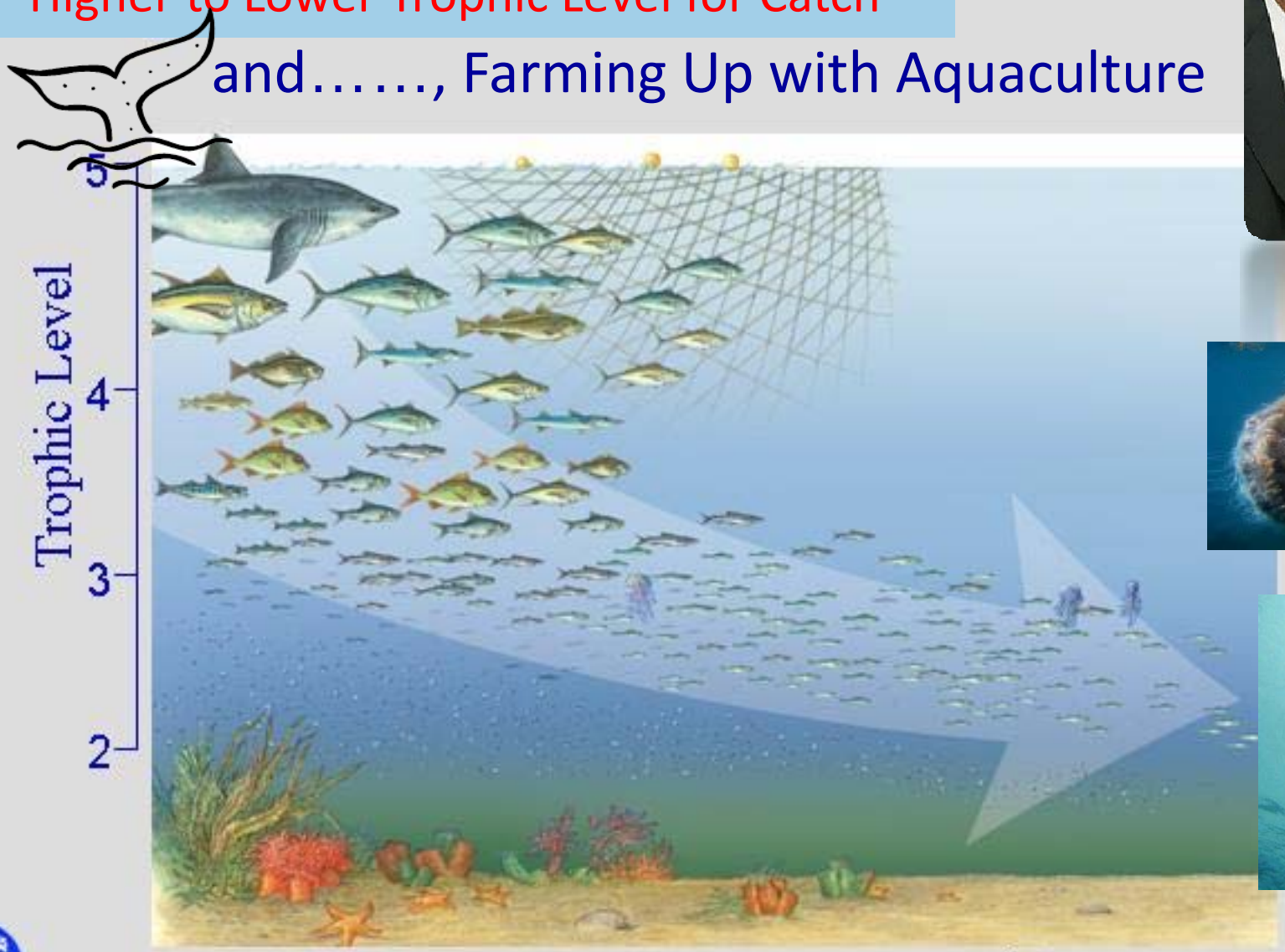
Effects of conventionally selective (red), unselective (blue), and balanced (dark blue) fishing. Unselective fishing harvests all exploitable nonmicrofauna and nonlarval ecosystem components. Balanced fishing mortality rates are set in proportion to productivity per biomass for each group. (Left) Results for total catch weight (as a percentage of the maximum total yield for a system across all fishing scenarios), (middle) total available biomass (i.e., biomass that could be harvested), and (right) extirpations (number of groups that have dropped below 10% of their unfi shed levels).

大魚だけ取る選択的漁業、資源保護に逆効果も（2012年3月2日 読売新聞）

- 水産資源保護のため、繁殖に達しない小さい魚は逃がして大きな魚だけを取る「選択的漁業」は逆に、生態系を乱しかねないとする研究結果を、国際自然保護連合漁業専門家グループなどの国際チームがまとめた。
- 選択的漁業としては、マグロやサバの漁網の網目を大きくするなどの対策が1950年代から広がっている。しかし、米カリフォルニア州沿岸のイワシ漁などの研究で、特定の種類の大きな魚だけを取ると、逆に資源量の変動を大きくしたり、魚の早熟化や小型化をもたらしたりすることが分かり、批判が出ていた。
- チームは、これまでに発表された36の計算シミュレーションを分析。特定の種類や大きさの魚に偏らず、バランス良く漁獲することで、漁獲量も資源量も増え、絶滅の危険性が少なくなることがわかった。

Higher to Lower Trophic Level for Catch

and……, Farming Up with Aquaculture



Watson and Pauly In: Atlas of the Ocean

NATIONALGEOGRAPHIC

1960年代の街の魚屋さん

Variety of species as whole fish

スーパーの魚売り場
Fish corner in Supermarket

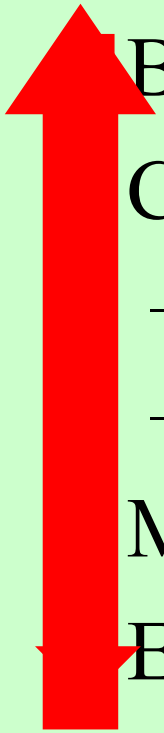
No varieties, ready to eat as fillets or sashimi packages

魚種･魚体選択についての最善の道は
Best Scenario for Species/Size Selectivity

魚体選択について

- 考えるべき視点は..?????
- Politically correct
  政治的に正しいか？
- Scientifically correct
  科学的に正しいか？
- Economically correct
  経済的に正しいか？
- Biologically correct
  生物学的に正しいか？
- Technically correct
  技術的に正しいか？
- Ethically correct
  倫理的に正しいか？
- Locally Correct
  地域の特性として正しいか？
- Globally Correct
  全地球的に正しいか？

魚種選択について



Bio-diversity
生物多様性
Catch diversity
漁獲物の多様性
– Fishing ground
漁場による多様性
– Fishing gear /methods
漁具漁法による多様性
Marketing diversity
市場の販売多様性
Eating Habit diversity
魚食の多様性

小さい魚を丸ごと食べる文化

シンポジウム　みんなで考える魅力ある漁業
～小型底びき網漁業を例に～

沿岸域における漁船漁業ビジネスモデル研究会　第2回研究大会　（2012年7月10日）

開催趣旨：沿岸域の漁船漁業は，収益性と持続性を両立させた「ビジネス」としての姿を目指さなければ、その存続すら危うい状況に置かれています。この現状を克服するためには，「操業の効率化による徹底した経費削減」，「過剰漁獲を回避するための資源の持続的利用方策」，「漁獲物の付加価値向上による収益性の向上」を包括した総合的な取り組みが必要と考えます。

本シンポジウムでは，小型底びき網漁業を例として，第一部では，漁業の現状と資源管理の概要，そして最新の漁具漁法技術について確認を行います。第二部では，様々な立場からの意見も踏まえ，漁獲物をどのように生産し、どのように流通させ、どのように販売するのかといった点に焦点を当て、それにより「利益の最大化」と「経営の安定化」を地域経済の中で如何に実現するかについて論議します。

沿岸域における漁船漁業ビジネスモデル研究会　第2回研究大会
みんなで考える魅力ある漁業～小型底引網漁業を例に～

- **第一部**

小型底びき漁業の概要と資源管理の現状　廣瀬太郎（水研セ開発調査センター）

小型底びき漁業の最新の漁具漁法技術　　胡 夫祥（東京海洋大学）

- **第二部【パネルディスカッション】**

漁業者の立場から訴えたいこと　　川口哲也（京都府機船底曳網漁業連合会）

小型底びき網漁獲物の新しい販売方法　　山根博信（鮮魚の達人）

販売者，消費者が求める「さかな」　　田中 修（中島水産株式会社）

儲かる漁業へのアプローチ ～全国アンケートと鳥取県事例紹介～

太田武行（鳥取県栽培漁業センター）

食の地域興しの事例

西原淳子（株式会社電通，元フードアクションニッポン推進本部事務局次長）

- **パネリスト，コメンテーター，会場参加者を交えた討論**

上田勝彦（水産庁研究指導課）

廣田将仁（水研セ中央水研経営経済研究センター）

塚田克郎（新潟県指導漁業士，昇栄丸）

ビジネスモデル研究会　News Letter

- タチウオ引き縄（大分県臼木）
- ズワイガニ底引網（京都府）
- 近海カツオ一本釣り（宮崎県日南市）
- 定置網における魚価向上（静岡県網代）
- 駆け回し網の挙動解析（北海道小樽）
- アマダイ延縄の共同出荷（島根県佐香）

- そして，六次産業化の推進

ビジネスモデルの目指すところ

- 儲かる漁業を実現するために

①利益を追求

利益＝漁獲量×単価　ー　経費

漁獲量を増やす，単価をあげる，経費を下げる！

②漁業は獲るだけではない

→「獲る」から「売る」までの総合力

③組織まで考えたビジネスモデルの構築

苦しい経営の原因は・・・・
魚価低迷，漁獲量減少，経費高騰

短期的な解決策

- 品質の良い魚を生産する
- 省エネ型の漁業に切り替える
- 多角経営を行う
- 多彩な売り方を展開する
- 一時加工を行う

長期的な取り組み

- 資源管理
- 魚食普及等の魚価向上対策

シンポジウムで考えたこと

- 魅力ある漁業とは・・・？
  ・・・頑張る漁業，儲かる漁業か？
  ・・・若者の参入が期待できる体制とは？
- 漁業者の声は消費者に届いていない！
- 生産者はどんな努力をすれば良いのか？
- 六次産業化，ブランド化の行方は・・・？
- 浜では魚が安すぎると言い，消費者は魚が高いという・・・生産・流通・販売のどこが問題か？
- どこでコストを下げられるのか？
- 魚食はハレの食品？　日常食に戻れるのか？
- 消費者が育てる日本の沿岸漁業