

# Community-based management for sustainable fisheries: Lessons from Japan



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# Introduction

- »» Overview of presentation  
CBM structure of Japan

# Overview of this presentation

- ~~▶ “One for All, All for One. That is the spirit of Japanese CBM.”~~
- ~~▶ “Fisheries Cooperative Association and fishing right are all you need for successful CBM.”~~
- ▶ Focus: incentive adjustment
  - In the context of comanagement (e.g., CBM).
- ▶ Fundamental necessary conditions
  - For functioning self-management
- ▶ Self-management in rebuilding fisheries
  - Stock and profitability

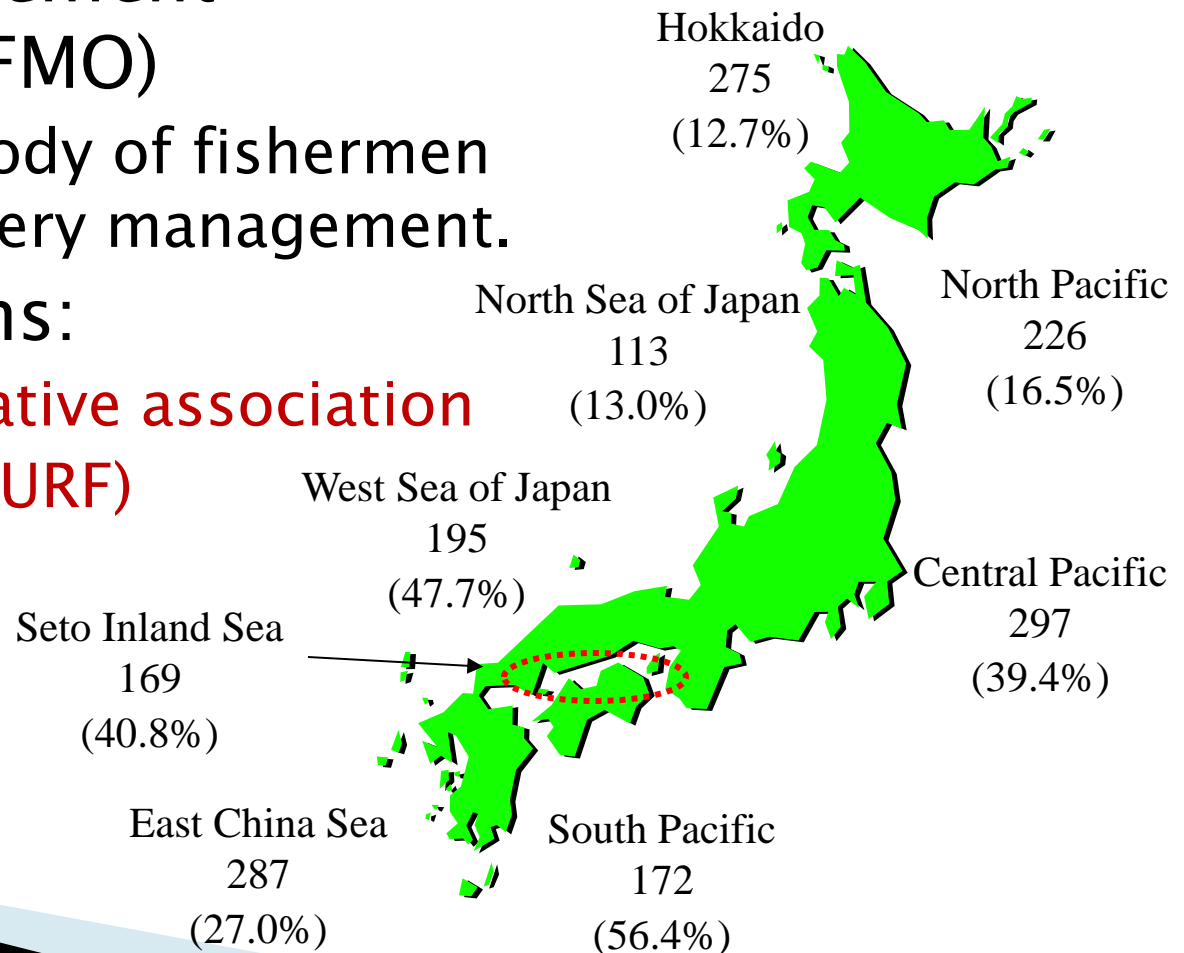
# What is CBM

- ▶ Community-based management (CBM)
  - One form of comanagement: “collective management by a group of local fishermen”
  - Increasingly considered as an alternative management scheme to command-and-control and I(T)Qs.
    - Harvester cooperatives (e.g., Alaska)
    - Sector allocation (New England)
    - Many developing countries

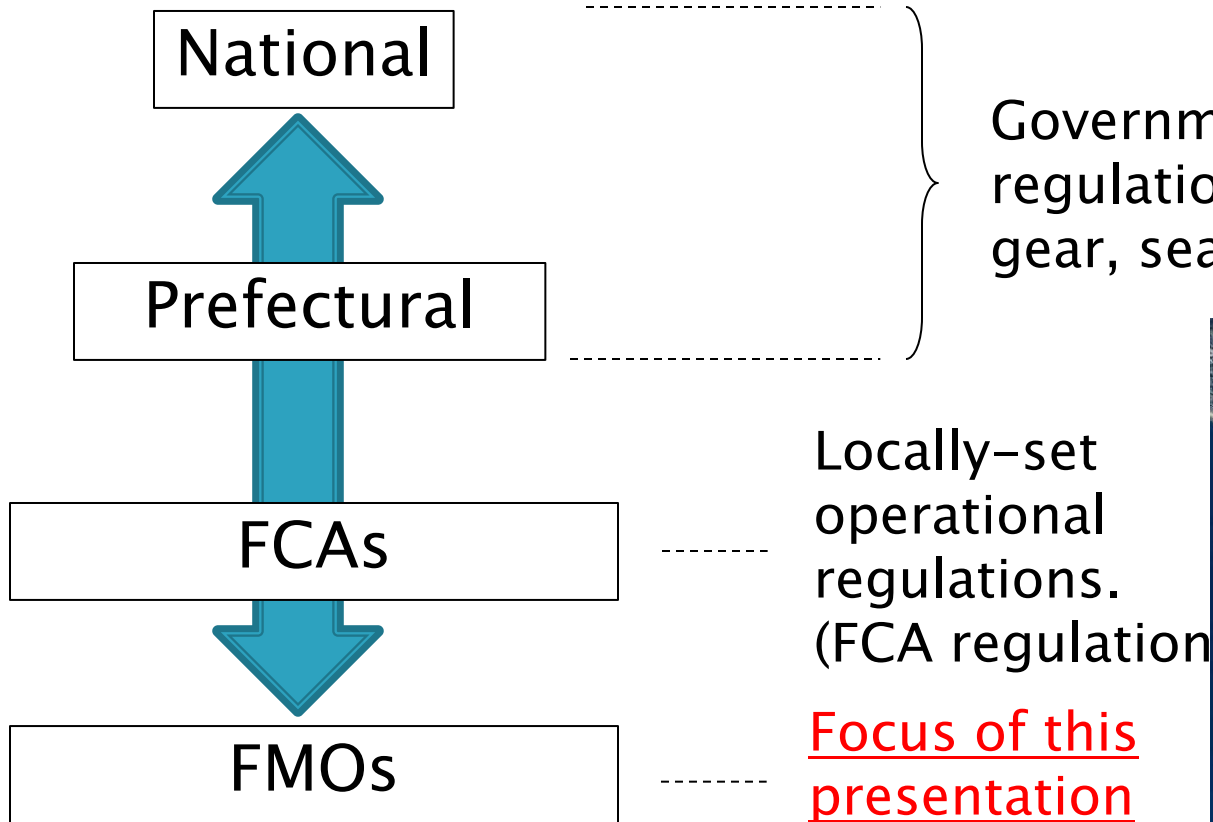


# Japanese coastal fisheries management

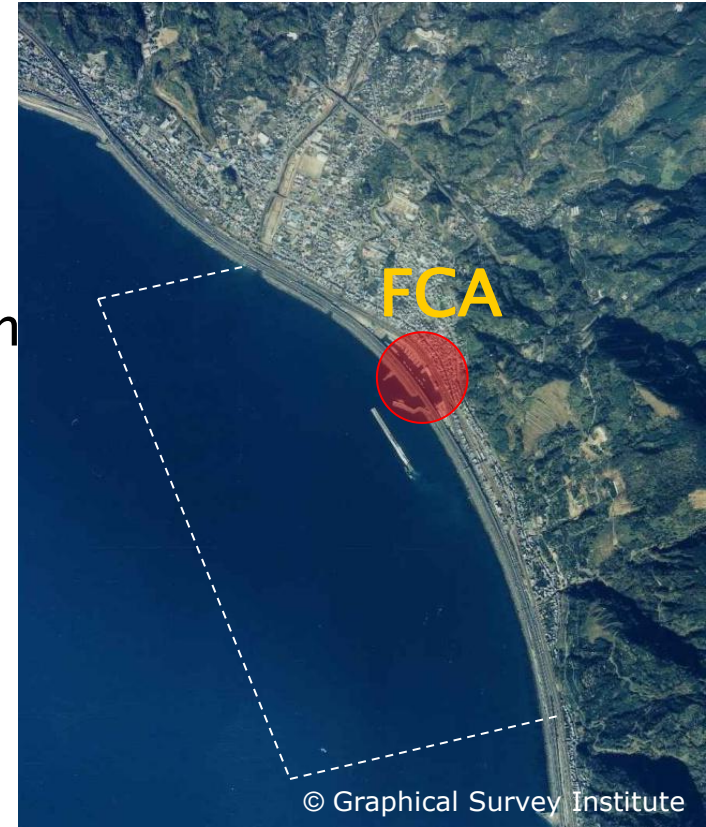
- ▶ Based on CBM principle
- ▶ Fishery management organization (FMO)
  - Autonomous body of fishermen formed for fishery management.
- ▶ Two institutions:
  - **Fishery cooperative association**
  - **Fishing right (TURF)**



# Regulatory structure



Source: Makino & Matsuda (2005)

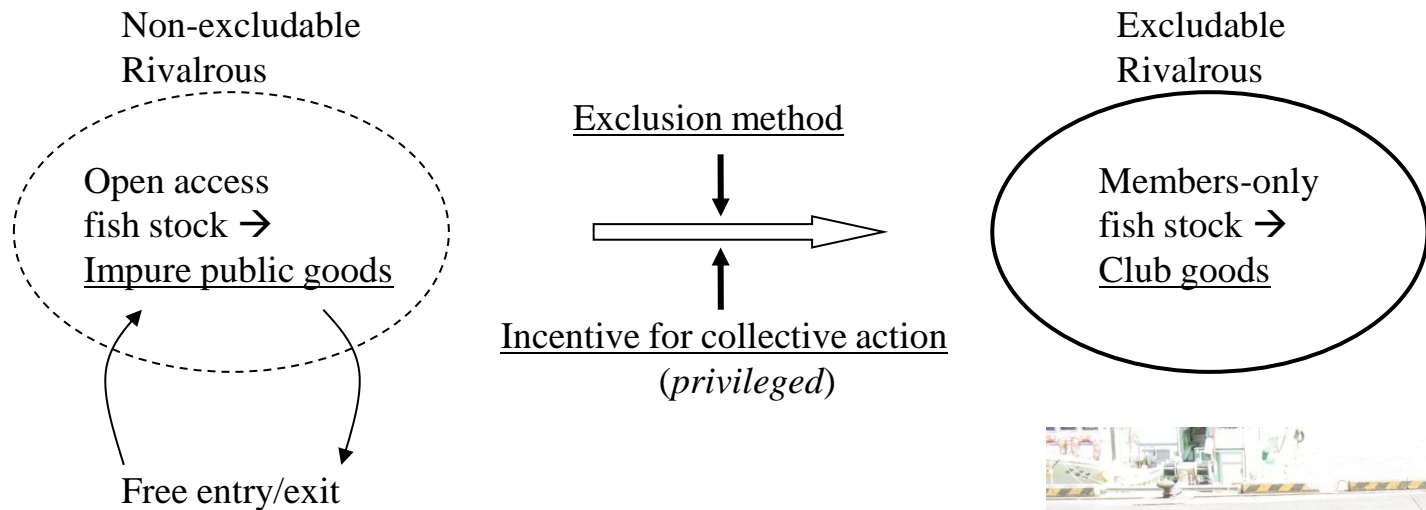


# Fundamental conditions

- » Functions of FCA and FR
- Things FMOs do

# Functions of FCA and FR

- ▶ Conceptual idea: Theory of Clubs
  - Provision of impure public good via collective action by those who demand it (Buchanan 1965).



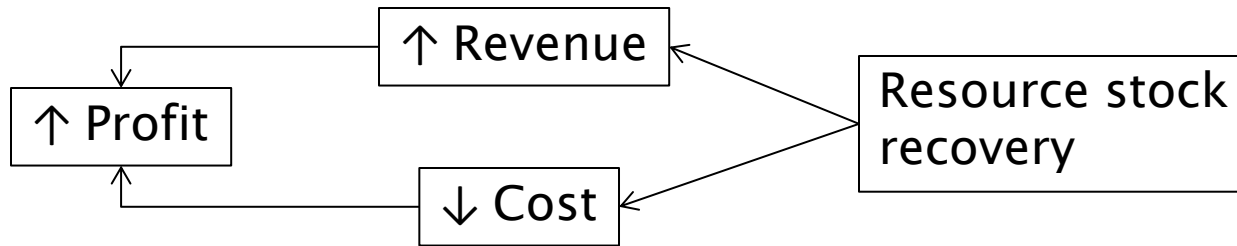


# Functions of FCA and FR (cont)

- ▶ Three necessary conditions for functional clubs:
  1. Well-defined boundaries
  2. Affordable exclusion methods
  3. Members are privileged
- ▶ FCA and FR provide #1 and #2
  - Certainly not the only way.
- ▶ Challenge is #3
  - Particularly so because membership size is often not a feasible option.

# Privileged—core challenge

- ▶ Profit increase is still a core concept
  - Commercial fishery is business.



- ▶ How to achieve those under CBM?
  - **Coordination of effort**
    - Production (fishing) to marketing
  - **Maintaining fairness**



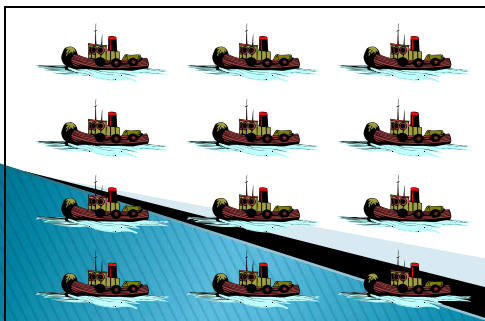
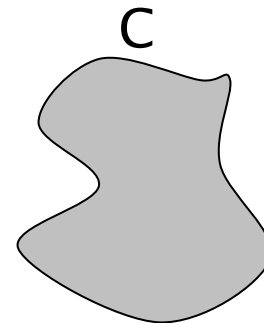
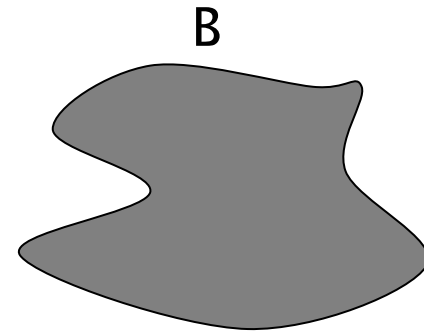
# Effort coordination

- ▶ Centrally managed allocation of effort across space and time.
- ▶ Objectives
  - Avoid race to fish
  - Avoid congestion and gear damage
  - Increase efficiency of fishing effort
- ▶ Methods include:
  - Fishing ground rotation and assignment
  - Alternating fishing days
  - Joint search and stock assessment at the beginning and/or during the fishing season
  - Sharing (i.e., co-ownership) of inputs



# Effort coordination: Production example

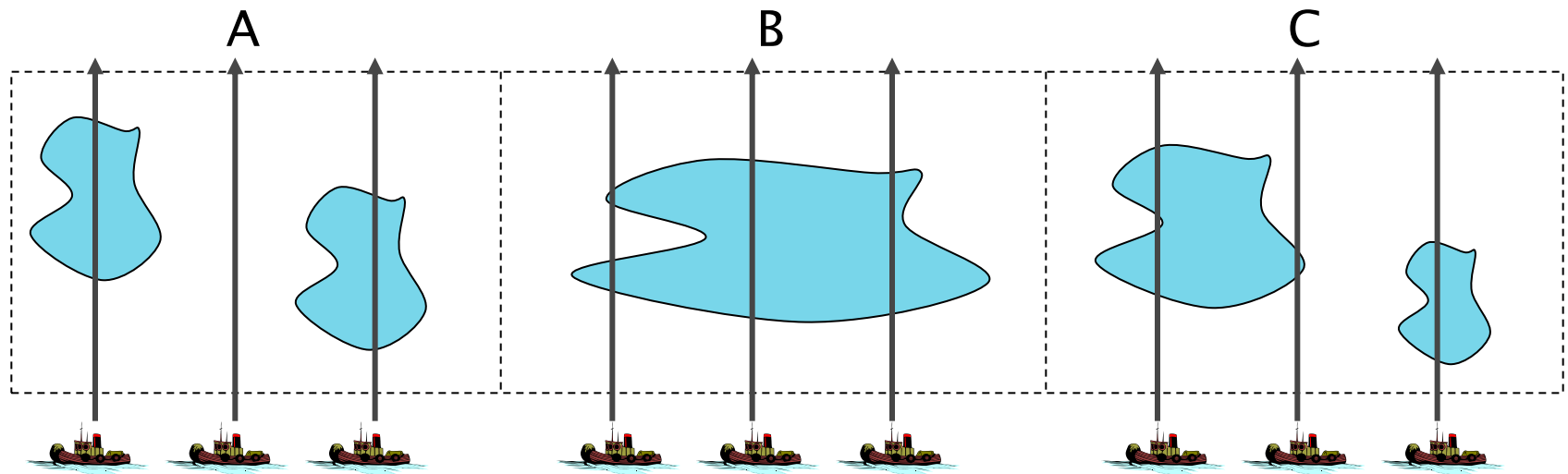
- ▶ Location assignment (e.g. Suruga Bay shrimp fishery)
  - Fishing Committee meets regularly
  - Directs vessels (or groups of vessels) where to operate



Port

# Effort coordination: Production example 2

- ▶ Rotating fishing ground (e.g. Hokkaido pollack fishery)



# Effort coordination

## Marketing example

- ▶ Differentiate from others and exploit niche markets.
  - Snow crab fishery (Kyoto)
  - Also Asia's first MSC certified
- ▶ Develop original brand
  - Pollack roe fishery (Hokkaido)
- ▶ Switching to higher-value product
  - Small shrimp fishery (Shizuoka) promoting sashimi consumption.
- ▶ Direct sales (including Internet)

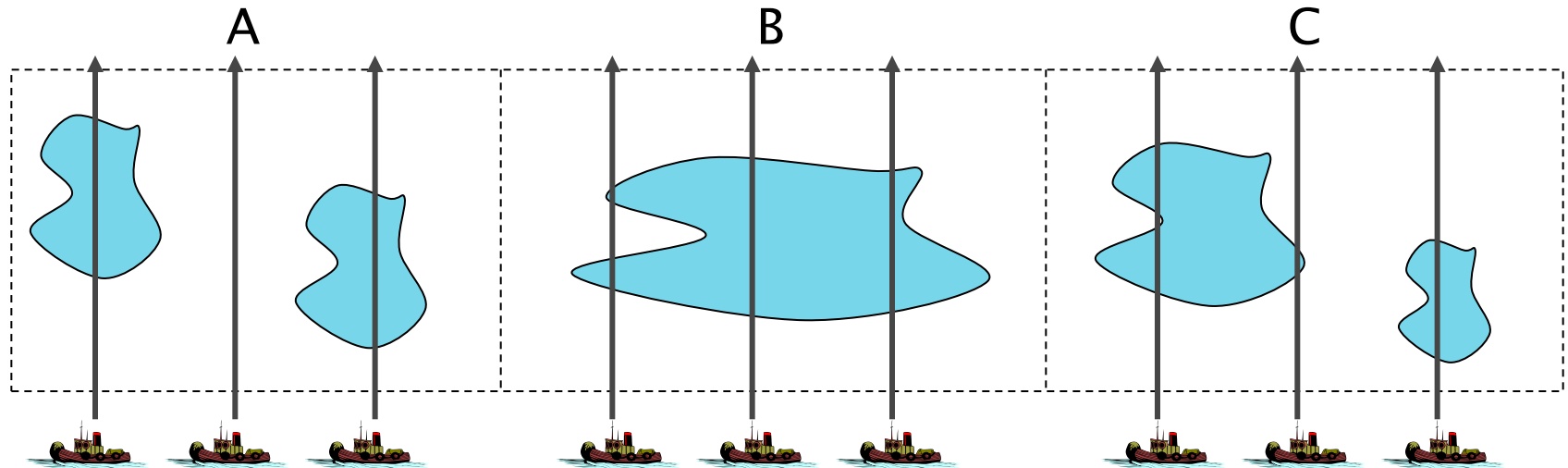


# Fairness

- ▶ Critical component with effort coordination.
- ▶ Two aspects of fairness.
  - Fishing opportunity (ex-ante)
  - Revenue earned (ex-post)

# Fairness: Ground rotation

- ▶ Some boats always get “empty” spot when at ground A.

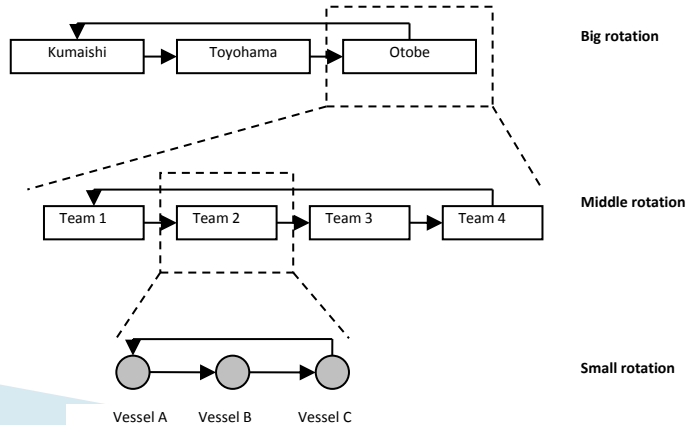
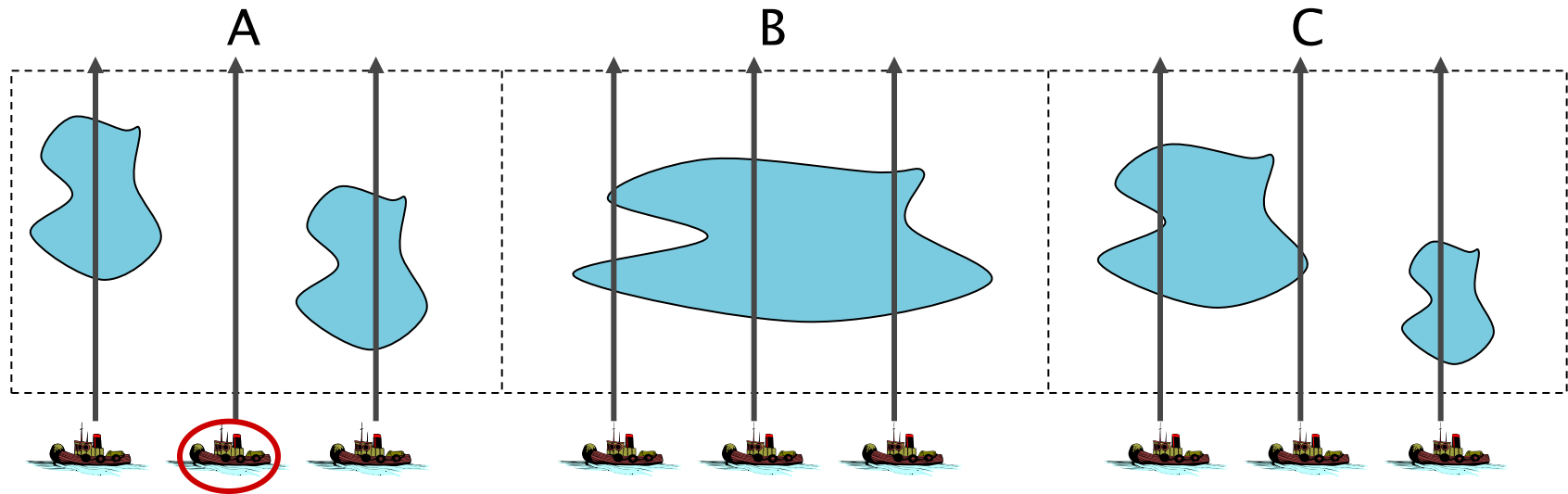




# Restoring fairness #1

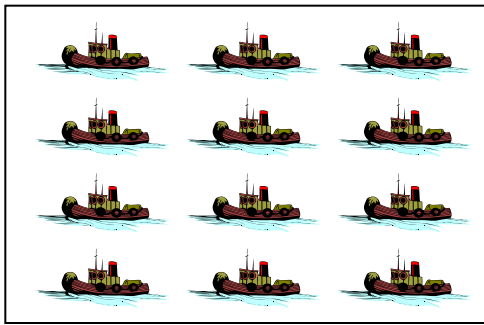
## Fishing opportunity

### ▶ Layered rotation scheme

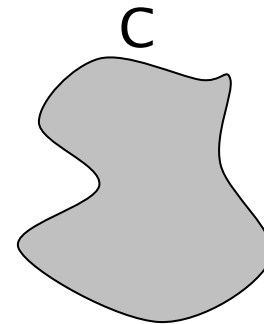
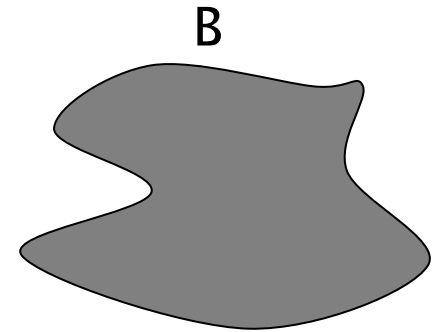


# Fairness: Location assignment

- ▶ Big difference in revenue depending on one's assignment.



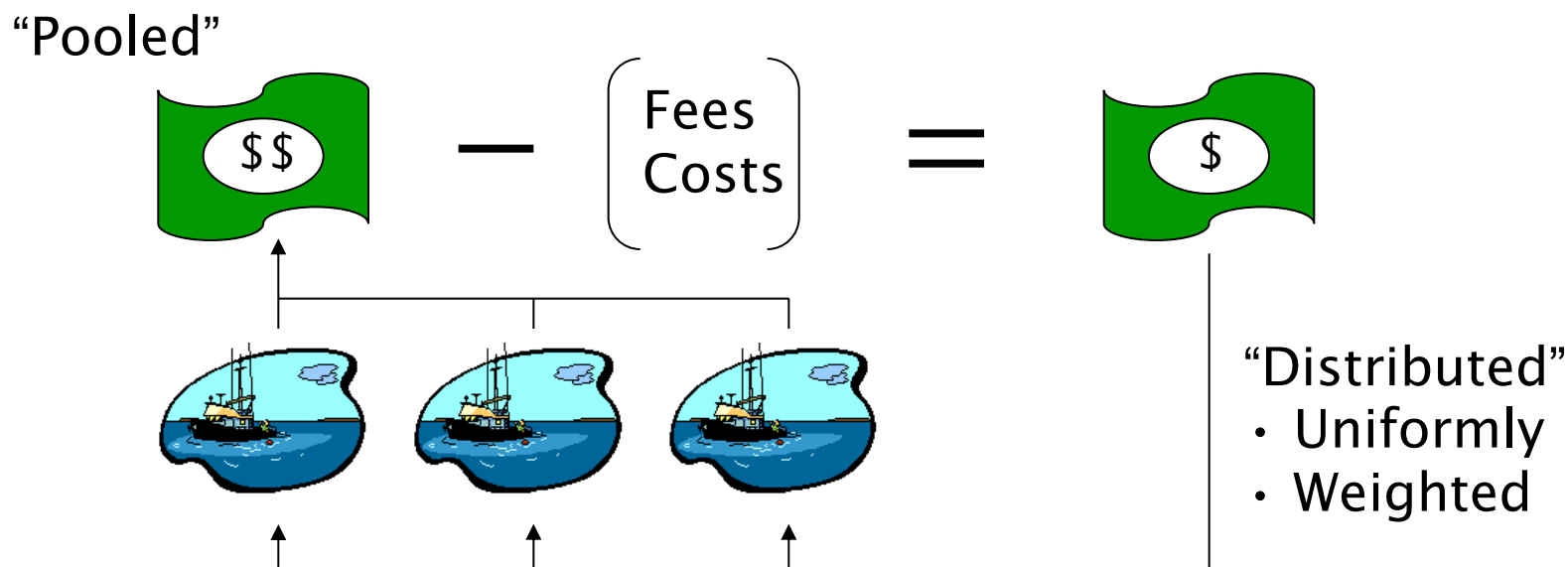
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# Restoring fairness #2

## Revenue

### ▶ Pooling arrangement

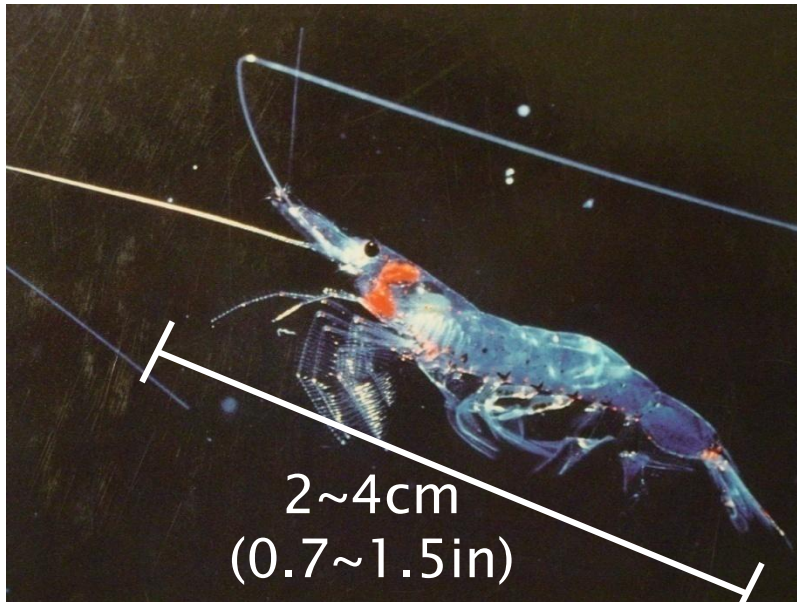


- ### ▶ 12% of 1,600+ FMOs have pooling arrangement.

# Outcomes

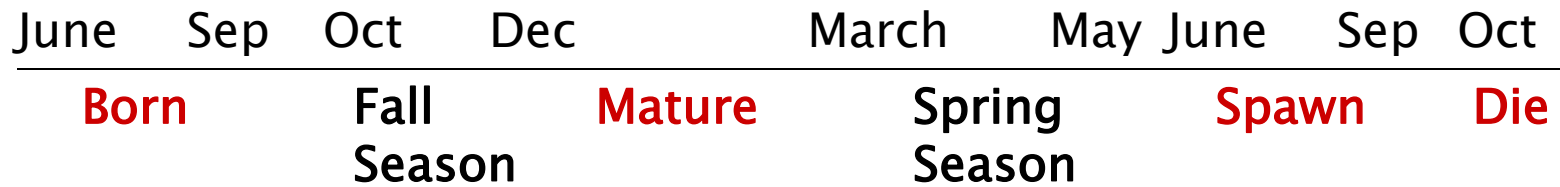
»» From two case studies

# Sakuraebi fishery



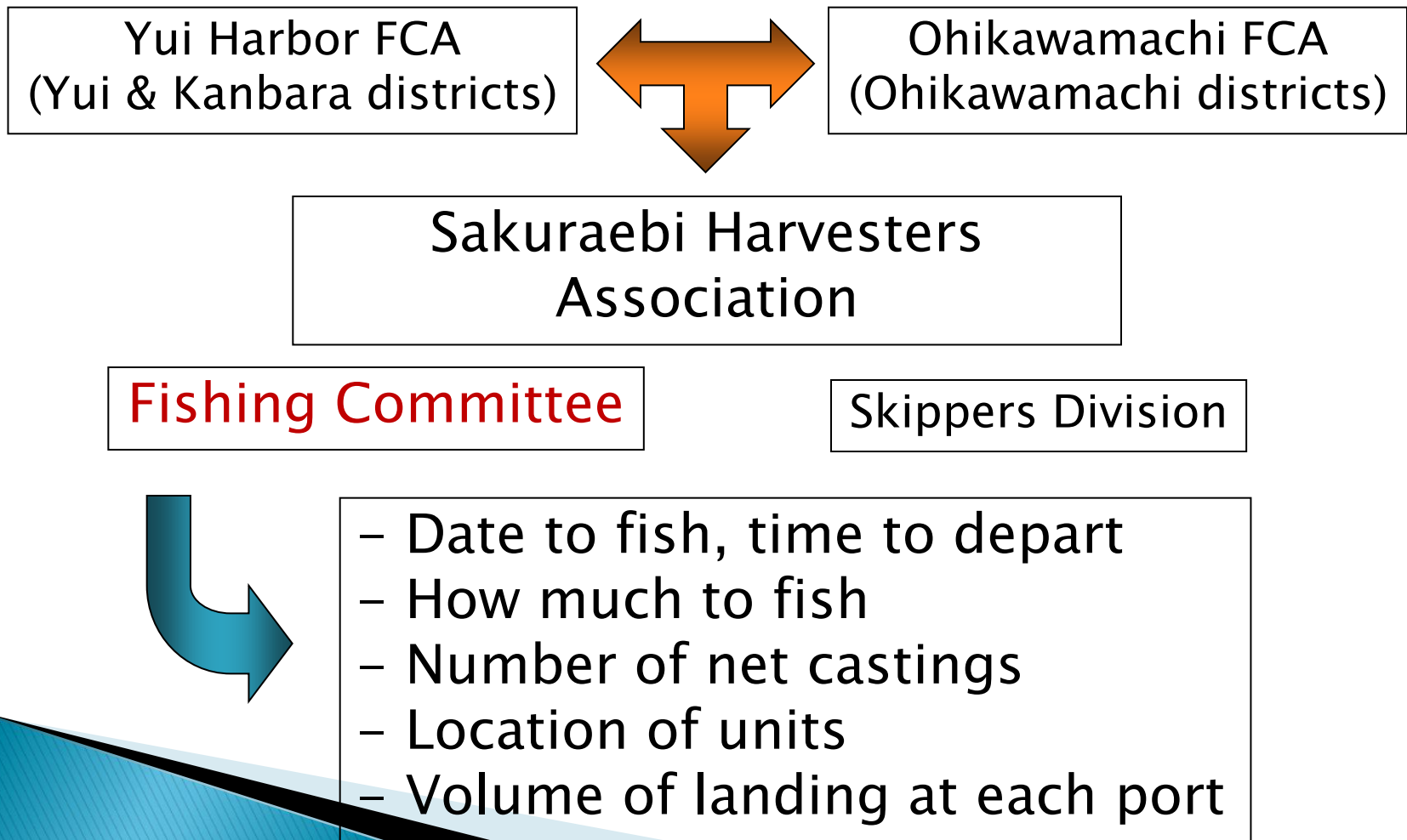
Sakuraebi (*Sergia lucens*)

- ▶ Life span = 1.5 years



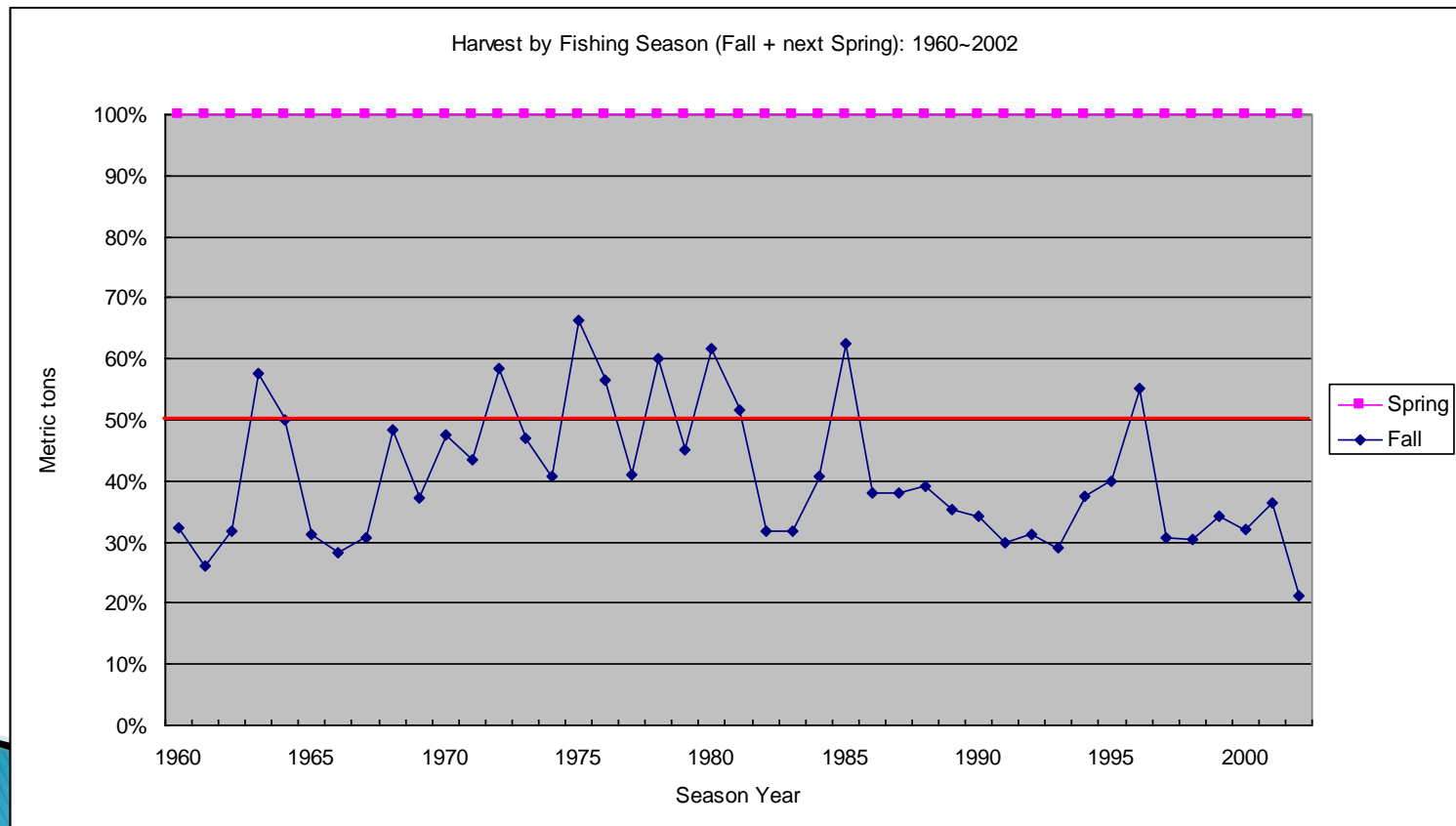
# Management structure

- ▶ High level of effort coordination.



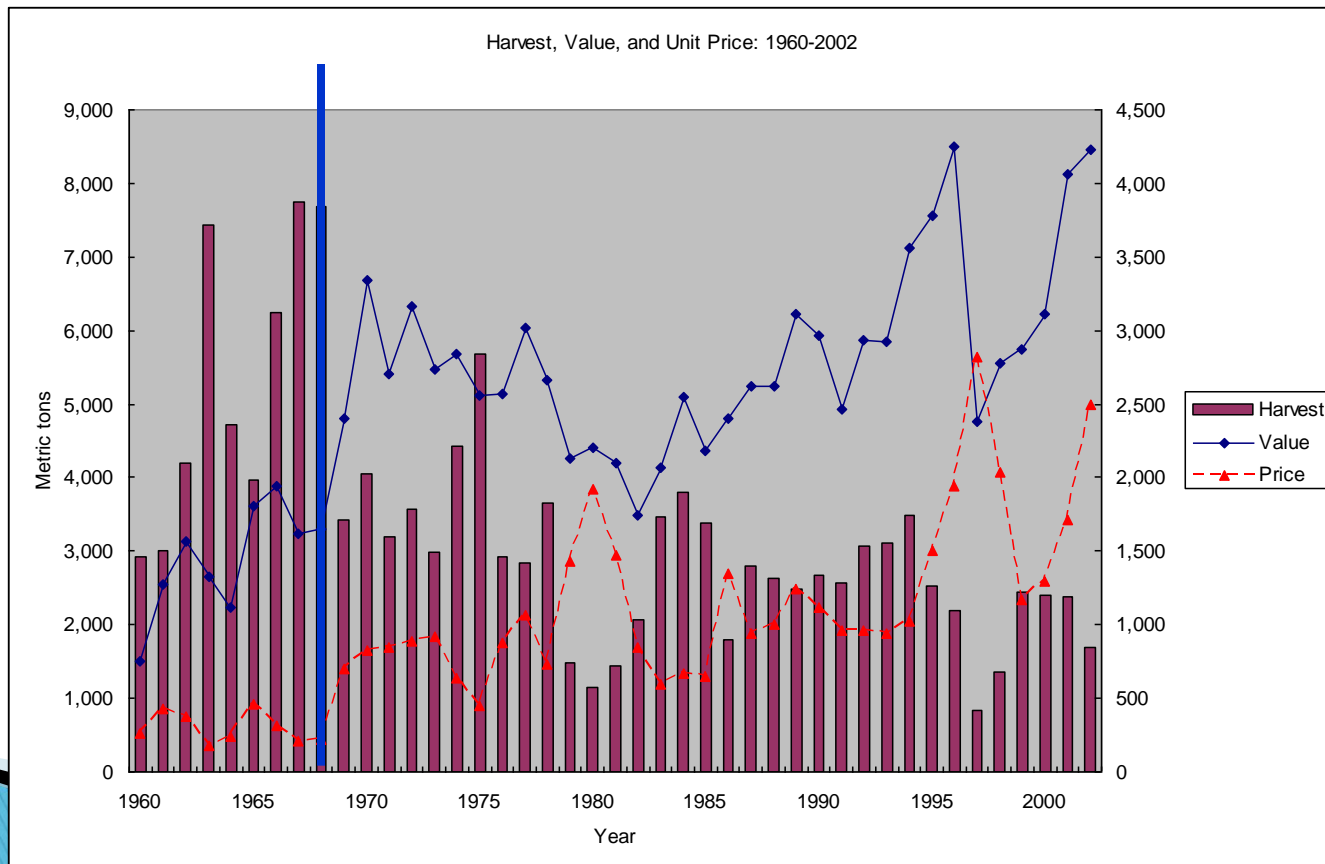
# Stock conservation effort

- ▶ Reduce fall season harvest (shift to spring)
  - Protecting juvenile (newborn) shrimp.



# Generating economic return

- ▶ Supply adjustment
- ▶ Quality control





# Pooling arrangement

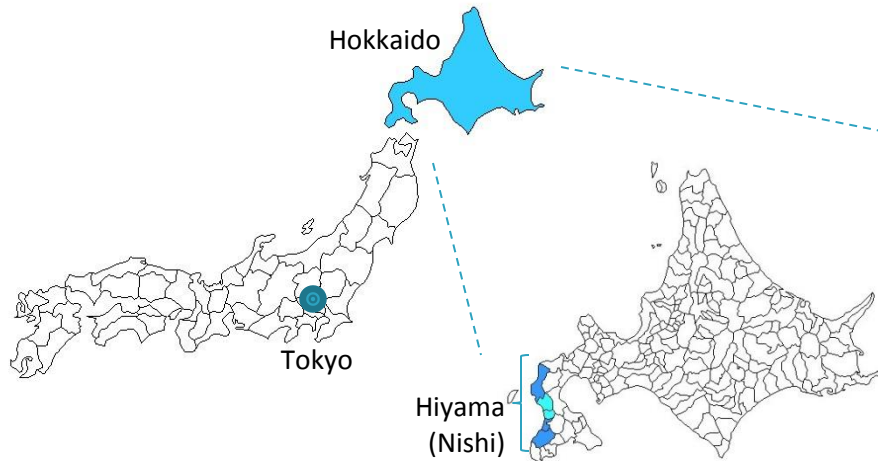


Spending more effort to remove debris from harvest.

Adjusting landing volume between vessels from different ports.

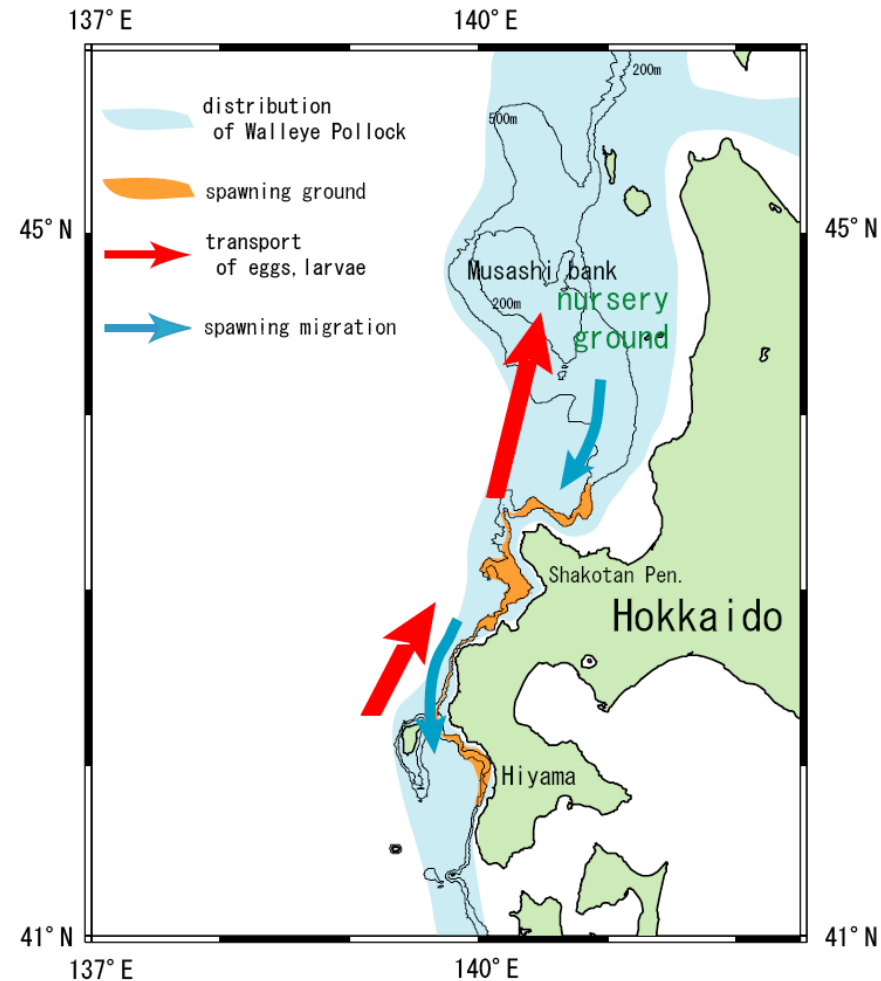


# Walleye pollack fishery



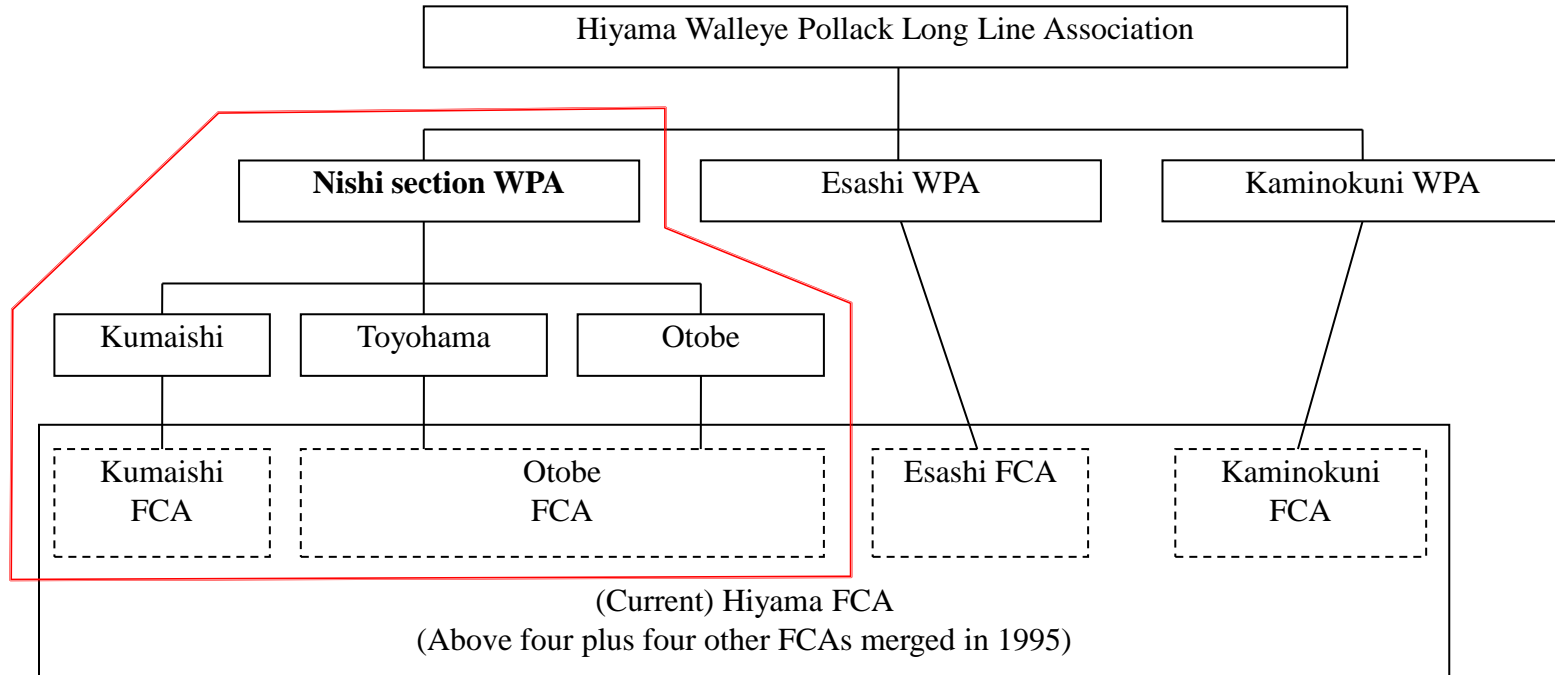
Walleye pollack  
(*Theragra chalcogramma*)

Photograph: Hokkaido Hakodate Fisheries Experiment Station



Hokkaido National Fisheries Research Institute

# Management structure



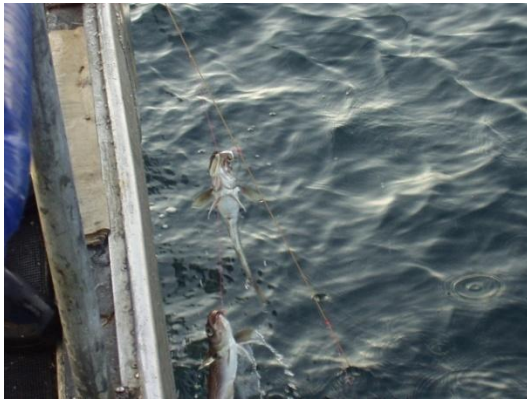
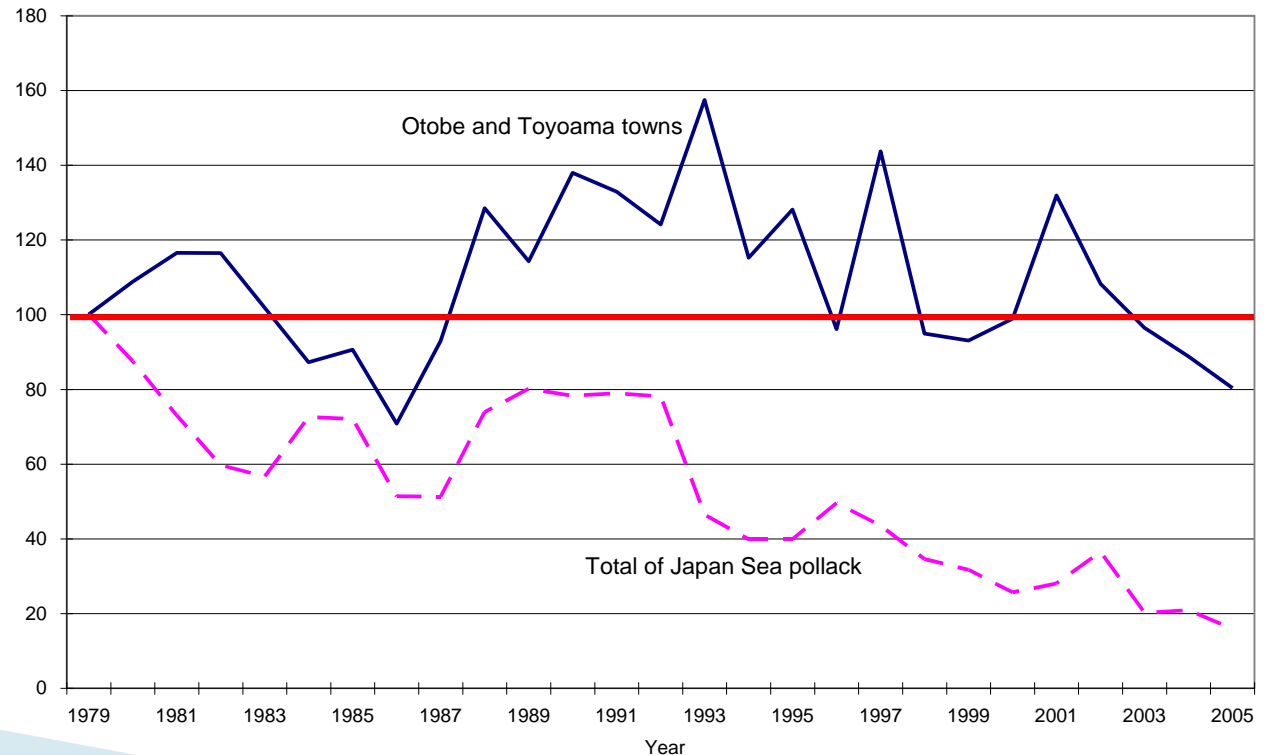
- ▶ Management rules employed:
  - Layered rotation scheme
  - Gear limit (length of longline)
  - No-fishing zone at spawning ground



# Stock conservation effort

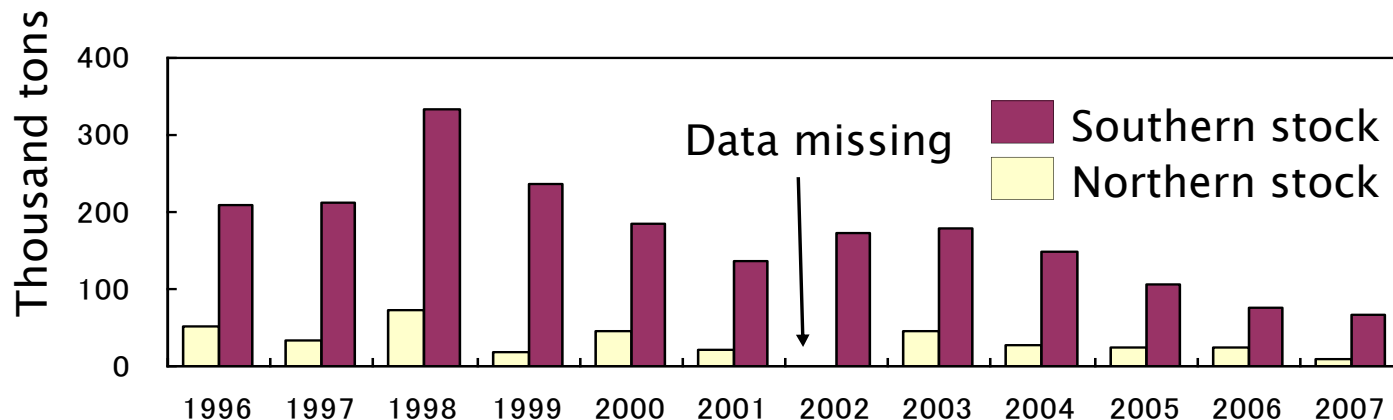
- ▶ Maintained harvest level on average
  - Other regions declined significantly.

Percentage change in total harvest volume (1979=100)  
(For Otobe and Toyohama towns in Hiyama region)



# ...but still have challenges

- ▶ Other regions sharing the same pollack stock are not putting the act together.

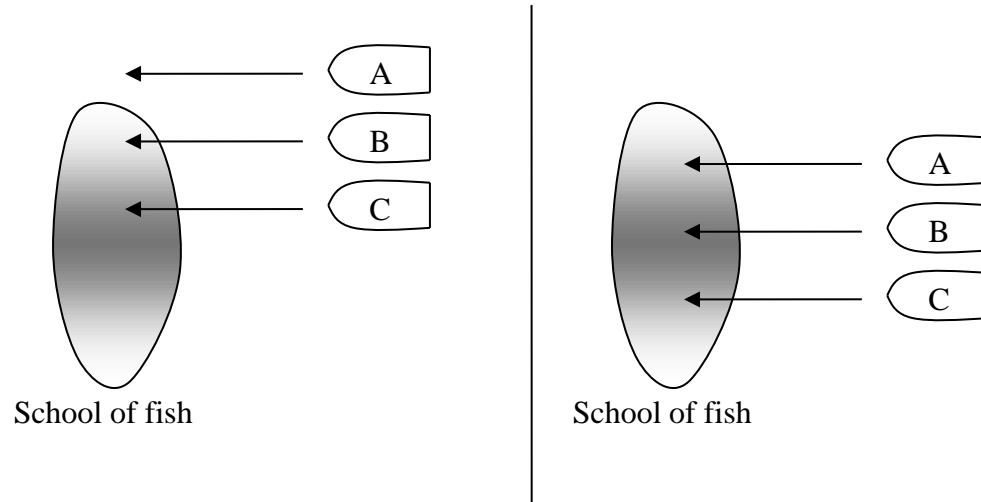


- ▶ Implications:
  - Sufficient return can overcome free rider problem.
  - But this is not sustainable.

# Fuel price hike in 2004-05

- ▶ The inefficiency of rigid rotation scheme became intolerable.

- Example:



- ▶ Pooling arrangement implemented in 2005.
  - In response to breaking the rotation pattern.

# Economic return

- ▶ Harvest volume and fuel use has declined as fishing days became fewer.
- ▶ Total profit declined (recovered slightly in 2007), but profit per fishing day was somewhat maintained.

	2002	2003	2004	2005	2006	2007
Volume (t)	--	--	110.0	108.0	86.3	79.4
Revenue (M)	35.2	26.4	28.5	27.0	18.4	18.5
Total cost (M)	14.4	14.2	14.2	13.8	10.8	9.9
Profit (M)	20.7	12.2	14.2	13.2	7.6	8.6
Fishing days	58	71	69	66	50	43
Profit/day (K)	357.1	172.1	206.3	199.9	152.6	201.1
Fuel use (KL)	10.6	12.8	12.5	12.6	10.5	9.6

# Discussions

- »» A note on government RRP  
Conclusion



# Resource recovery plan (RRP)

- ▶ Launched in 2001 by central government
  - 63 RRPs (17 central, 46 prefectural level)
  - Stakeholder committee determines the need for RRP.
  - Government (national/local) provides a master plan.
- ▶ FCAs/FMOs based at the outset, but questions remain as to their ownership
  - 58.7% (82.4% national, 50.0% local) of RRPs has explicit provision of compensation for the losses incurred.
  - Not incentive adjustment; this is incentive **clouding**.

# RRPs

- ▶ Results still remain to be seen
  - Most RRP's target year is 2011.
- ▶ Recent assessment of 83 stocks:

		Trend			
		Increasing	Unchanged	Decreasing	Subtotal
Level	High	5 (6%)	6 (7%)	5 (6%)	16 (19%)
	Medium	5 (6%)	17 (21%)	4(5%)	26 (31%)
	Low	9 (11%)	25 (30%)	8 (10%)	42 (51%)
	Subtotal	19 (23%)	46 (55%)	17 (21%)	83 (100%)

- 51% of stocks at “low” level.
  - 60% of that (30% overall) has not improved.

# Concluding remarks

- ▶ Incentive matters!
  - Profit enhancement, possibly with social objectives.
- ▶ Three necessary conditions for CBM:
  - Boundaries, exclusion method, privileged.
    - Benefits generated do not “leak”.
    - Avoid “new member” problem.
  - To meet privileged condition:
    - Effort coordination
    - Fairness (ex-ante/post)
  - Ways to meet these conditions are not restricted to FCAs, FRs, or FMOs.
    - Applicable in other regions.

