

## Management and Conservation

How can fisheries scientists inform the management process?  
What can realistically be achieved through management?

### Management Objectives:

- Biological (protect stock or rebuild stock)
- Social (employment, stability of coastal communities)
- Economic (maximize economic benefits)
- Political (avoidance of conflict)

Ideal: clear management strategy, easy to measure its effectiveness, management actions supported by all fishers and interest groups

### Types of Management Action:

(1) Catch controls (usually landings controls):

Control fishing mortality by limiting the weight of the catch that fishers take

Total allowable catches (TAC): limits the total catch taken from a specified stock

Individual quotas (IQ): vessel catch limits (TAC) divided between fishing units

If there is high-grading, IQ will not directly control fishing mortality

### Total allowable catches (TAC):

-- "race" to fish because resource is common property; want to maximize share  
Manifested as shorter fishing seasons, reduced fish quality, higher bycatch, and more dangerous working conditions

Also encourages use of larger and more powerful vessels to compete more effectively for share of the catch

### Individual Quotas (IQ):

-- restricts catches of individual fishers

IQs allow fishers to catch quota at a suitable rate; guaranteed share of TAC vs. having to compete for it

Manifested as improved catch quality, increased stability of supply to markets and processors, increases safety for fishers

Problem with IQs: increases the risk of fishers high-grading their catch; initial allocation of IQ can be contentious

IQs best suited to manage a few large vessels that land catches in a few ports (easier enforcement)

ITQ (individual transferable quota): fisher has property rights and allows them to trade those rights with other fishers

**Types of Management Action:**

(2) Effort controls (input controls):

Limit number of boats or fishers who work in a fishery, the amount and type of gear used

Aim is to reduce the catching power of fishers to reduce fishing mortality

Effort controls: (1) individual effort quotas and (2) vessel or gear restrictions

Limited licenses limit amount of time spent working by a unit gear, vessel, or fisher

**Types of Management Action:**

(3) Technical measures:

Restrict the size and sex of fished species

-- most useful when measured in situ or returned to the sea alive

-- gear restrictions (net mesh size)

-- sex restrictions; restrict capture of mature females

Aim is to reduce the catching power of fishers to reduce fishing mortality

Effort controls: (1) individual effort quotas and (2) vessel or gear restrictions

Limited licenses limit amount of time spent working by a unit gear, vessel, or fisher

**Management Effectiveness:**

When used independently, catch controls, effort controls, and technical measures are unlikely to meet management objectives

ITQs, used with technical measures appears to work most effectively to optimize resource conservation and economic performance.

Management particularly ineffective for multispecies demersal fisheries where gears were unselective and with large bycatch

**Improving Management:**

- Enforcement and Compliance
- Co-management
- Uncertainty and the Precautionary Approach
- Science
  - data-poor management
- Managing fisheries for conservation
  - endangered species
  - habitats
  - protected areas / no-take zones

**Future trends?**

- Fisheries science
- Fisheries management