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Marine Education

Introduction to Fisheries Management

1. Data Collection

How many fish are there?

Catch per unit effort (CPUE)

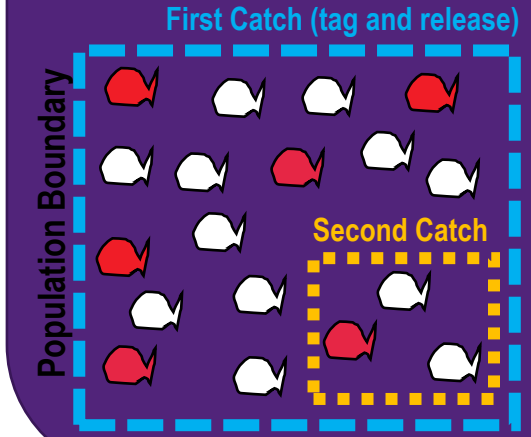
E.g. 10 fish/hr or 100 fish/hr

Lots of fish in the catch EQUALS
Lots of fish in the unit stock (pop.) right?!

For example, as 'Observers'

To estimate *population size* of *mobile* organisms: Capture-Recapture Method (Lincoln Index)

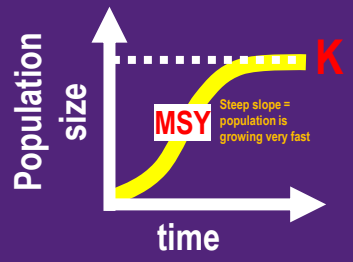
More tagged recaptures EQUALS smaller population, right?!



Lincoln Index:
1 : 3 = 6 : 18
m / n = M / N
N = M x n / m
18 = 6 x 3 / 1

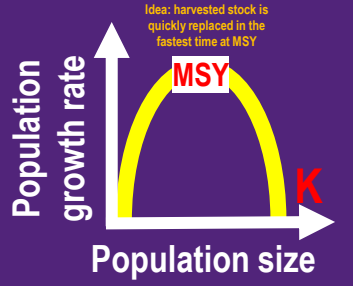
2. Stock Assessment

How many fish can we catch?



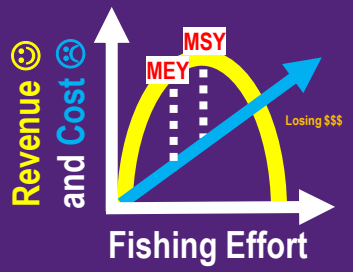
Logistic Growth Curve

- K: *carrying capacity*
- K: maximum population size
- K: births + immigration EQUALS deaths + emigration



Maximum Sustainable Yield

- K/2
- Fastest Birth rate
- Fastest Population Growth rate



Maximum Economic Yield

- At MEY, the fishery (as a whole) makes MORE money, for LESS fishing effort (than MSY)

Q. How do we make sure the level of fishing effort stays at or below MEY?

3. Management

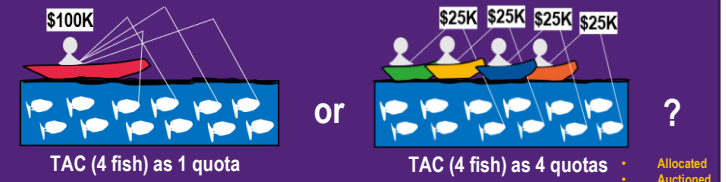
How do we stop people overfishing?

"Fisheries Management is about managing people, not fish"

Input controls
Output controls

Licences, gear restrictions, taxes, closures…
Selectivity criteria (e.g. size/age/sex), landing fees, TAC (total allowable catch), quotas…

Fishery Mgmt. Plan



"Quotas stop the RACE to catch fish"

Who is making and enforcing the rules?

Governance: Top-down vs. bottom-up governance, co-mgmt., RFMOs…

Types of management plans

Single-Species Fisheries Management (SS)		Fishery Mgmt. Plan MSY MEY
Ecosystem-based Fisheries Management (EBFM)	Climate Habitat Predator	Fishery Mgmt. Plan MSY MEY Plus MPA's & Bycatch

Q. Not enough scientific data? Ans. *Precautionary Principle* applies!

A Marine Protected Area (MPA) MUST be designed well

Criteria to design MPAs
- ❑ site selection
- ❑ networking and connectivity
- ❑ replication
- ❑ spacing
- ❑ size and coverage

Dynamic Spatial Zoning Fish Management