

North Pacific Commercial Fishing Gear and its Management Implications

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Gear Evolution



- ▶ Variety of gears used
- ▶ At first, effectiveness was sole criterion
- ▶ Beginning a century ago, conservation began being considered.
- ▶ Now gear choice a mix of many factors, including product quality

Why are some gear types used in some districts or areas and not others?

- ▶ Geography of the grounds
- ▶ Prevailing economic conditions
- ▶ Nature of stocks and their behaviors
- ▶ Local traditions, deriving from the above
- ▶ Increasingly, product quality considerations

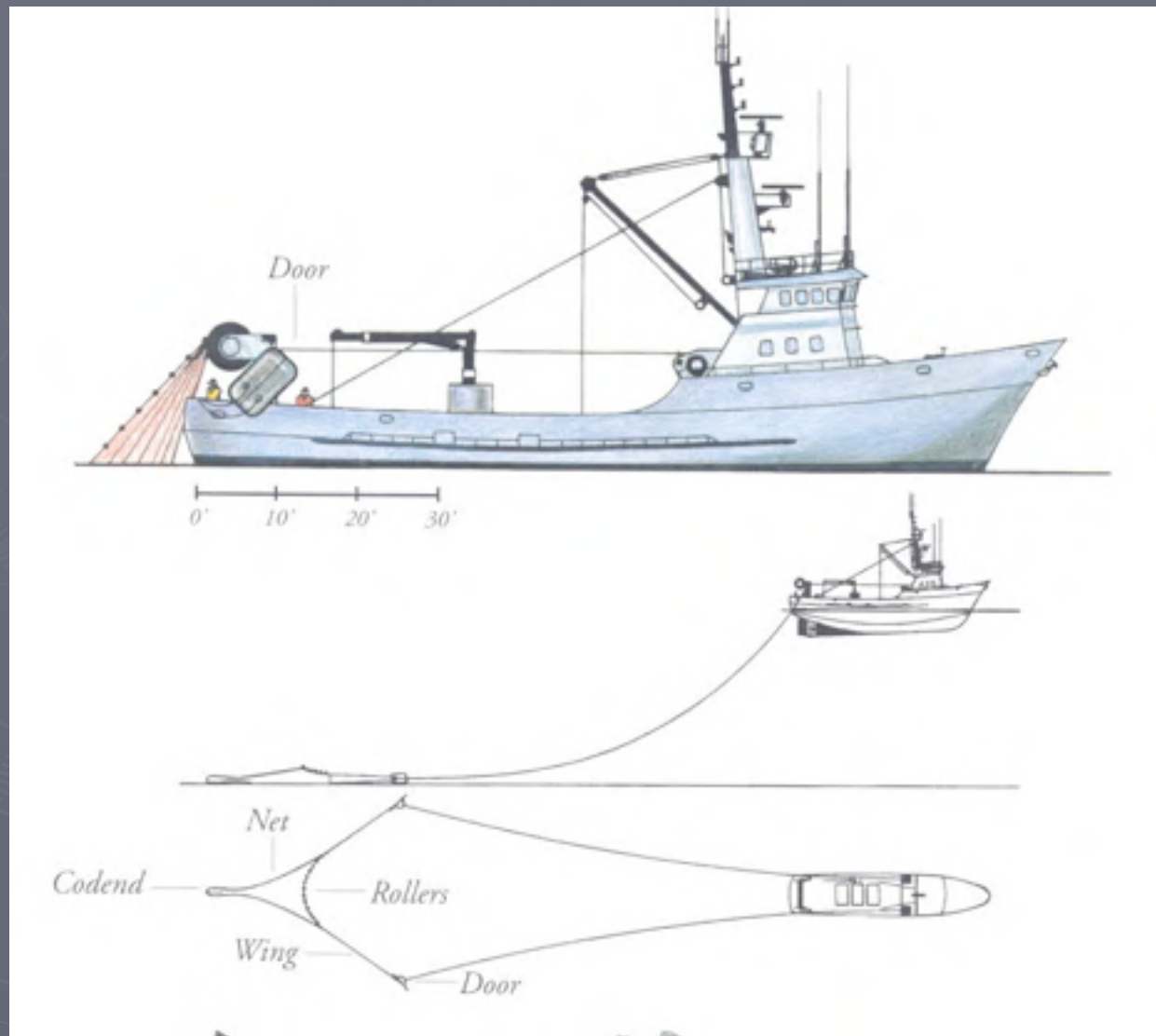


Passive vs Active Gear

- ▶ Capital cost
- ▶ Operating cost
- ▶ Crew demands
- ▶ Oceanographic constraints
- ▶ By-catch considerations
- ▶ Product quality

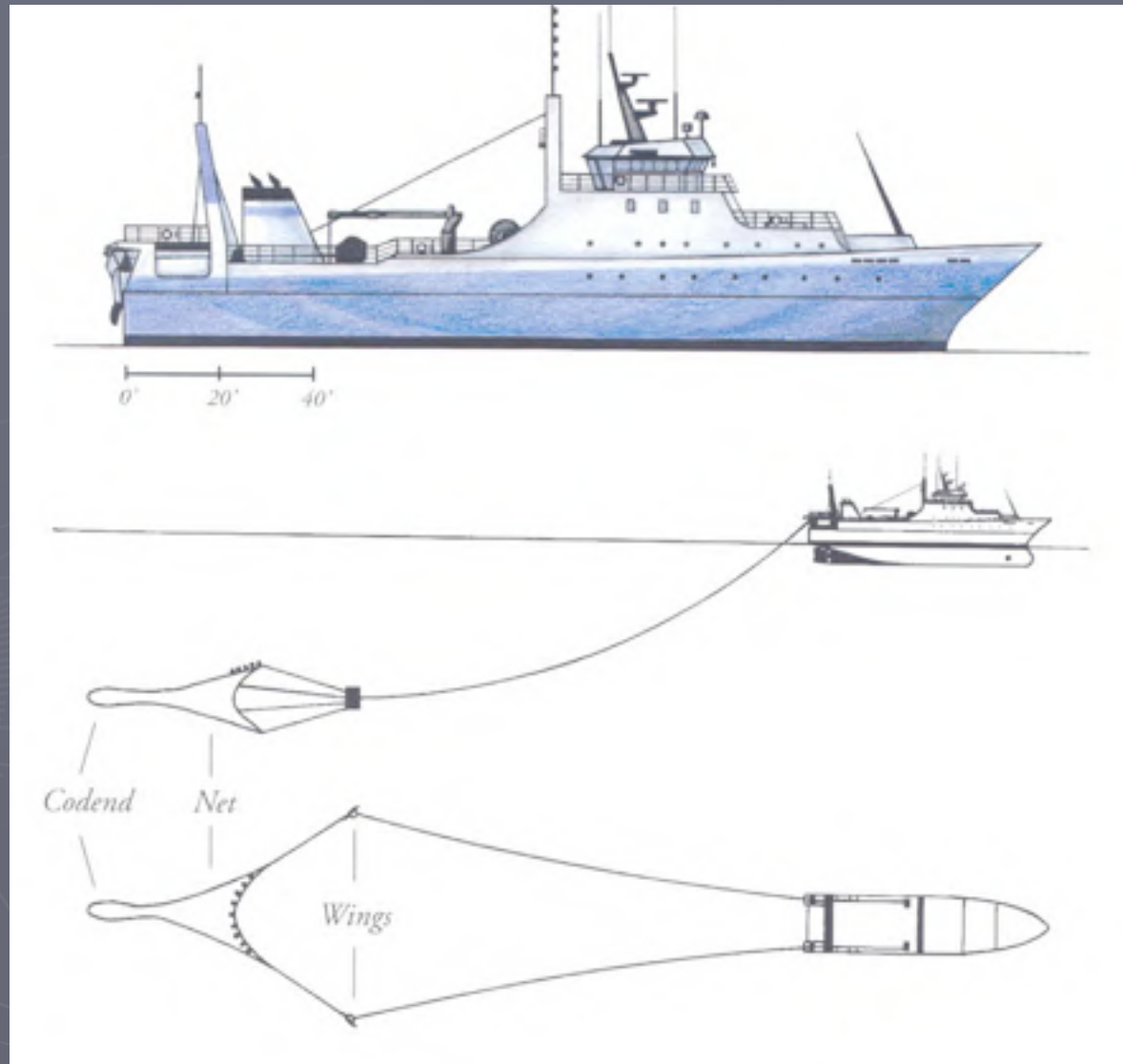


Examples of Active Gears Bottom Trawl



Examples of Active Gears

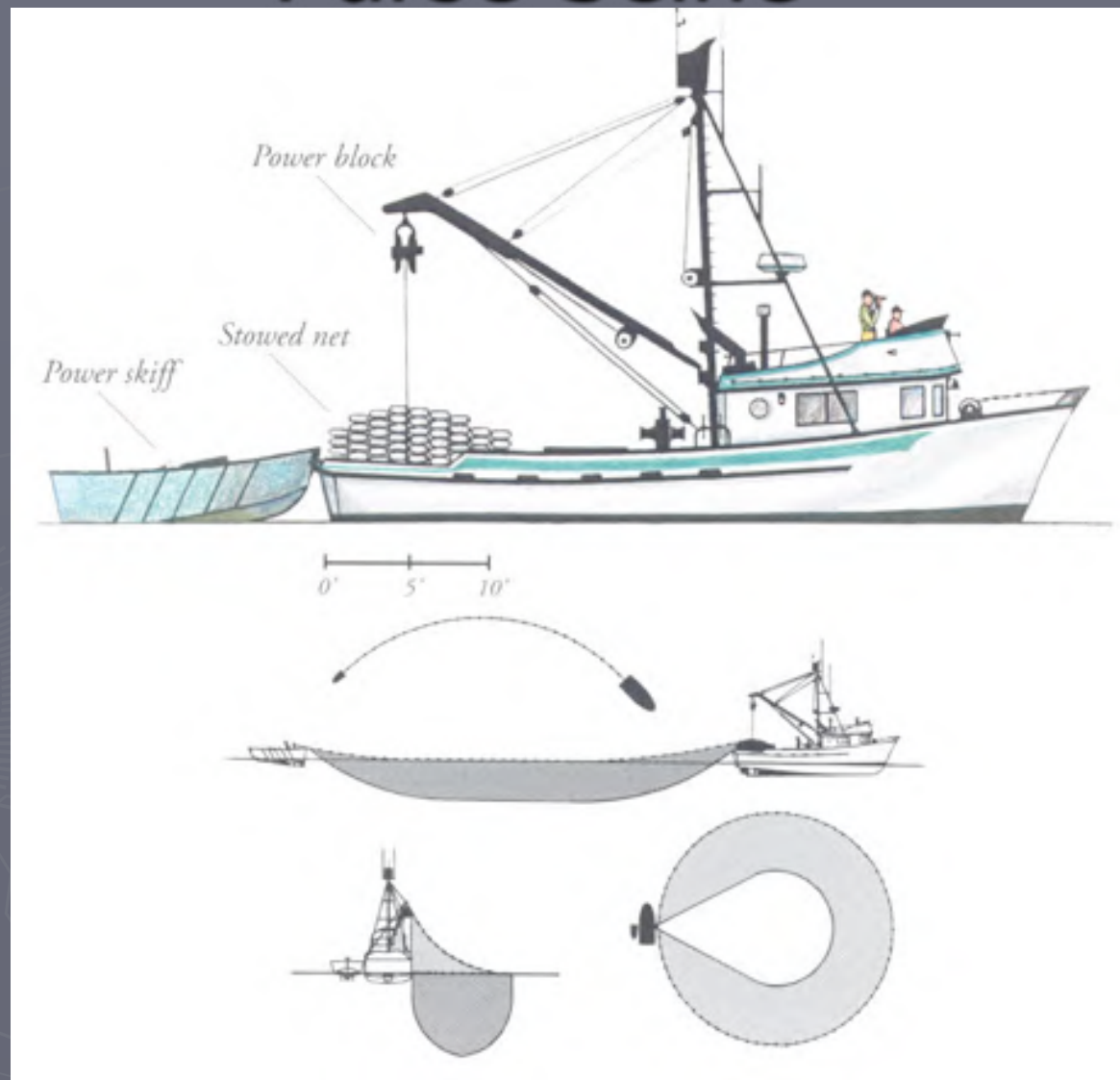
Midwater (pelagic) Trawl



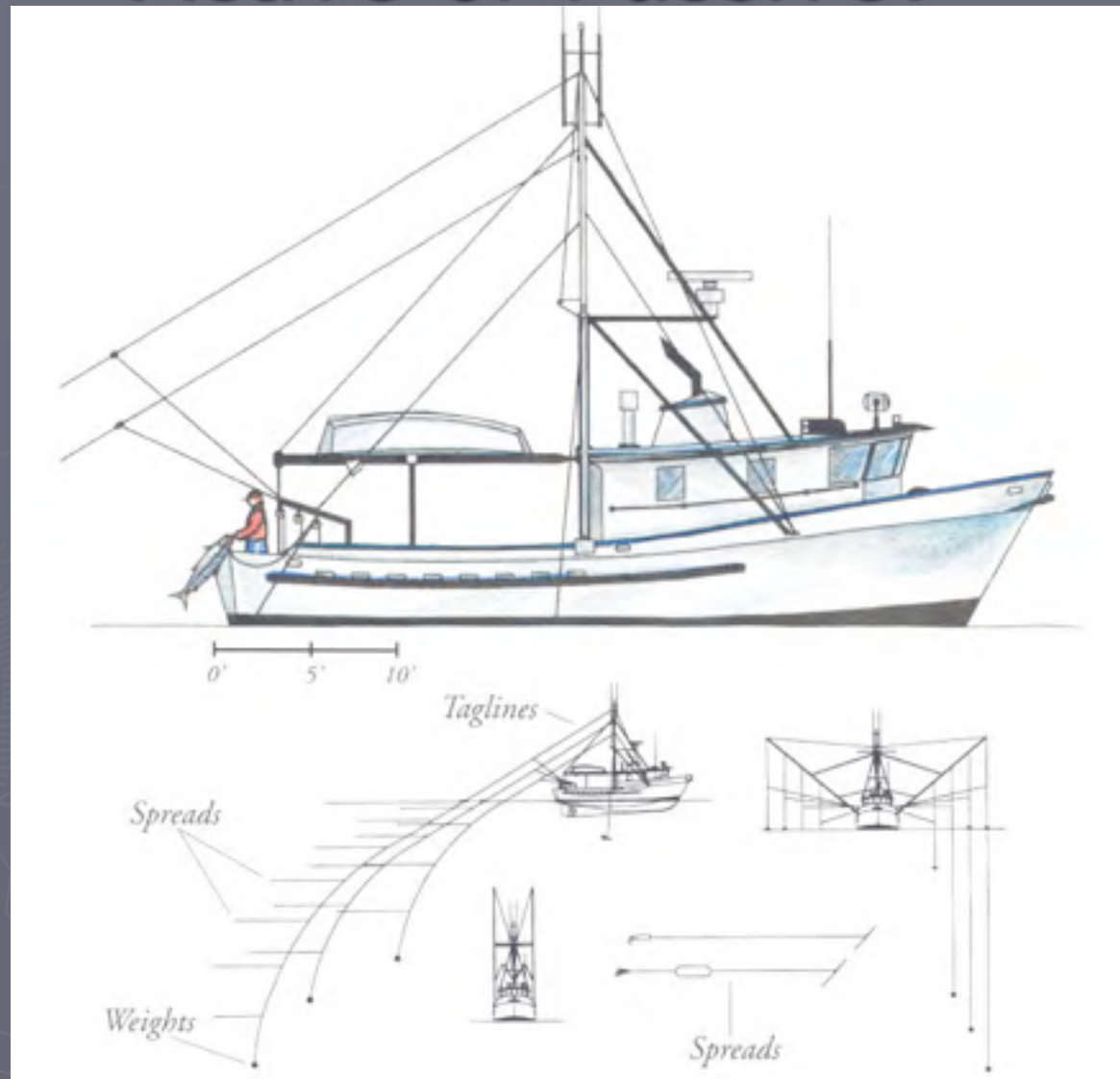
Scallop Dredge



Another Active Gear: Purse Seine



What about Trolling... Active or Passive?



And how about drift gillnetting?
It's a passive gear

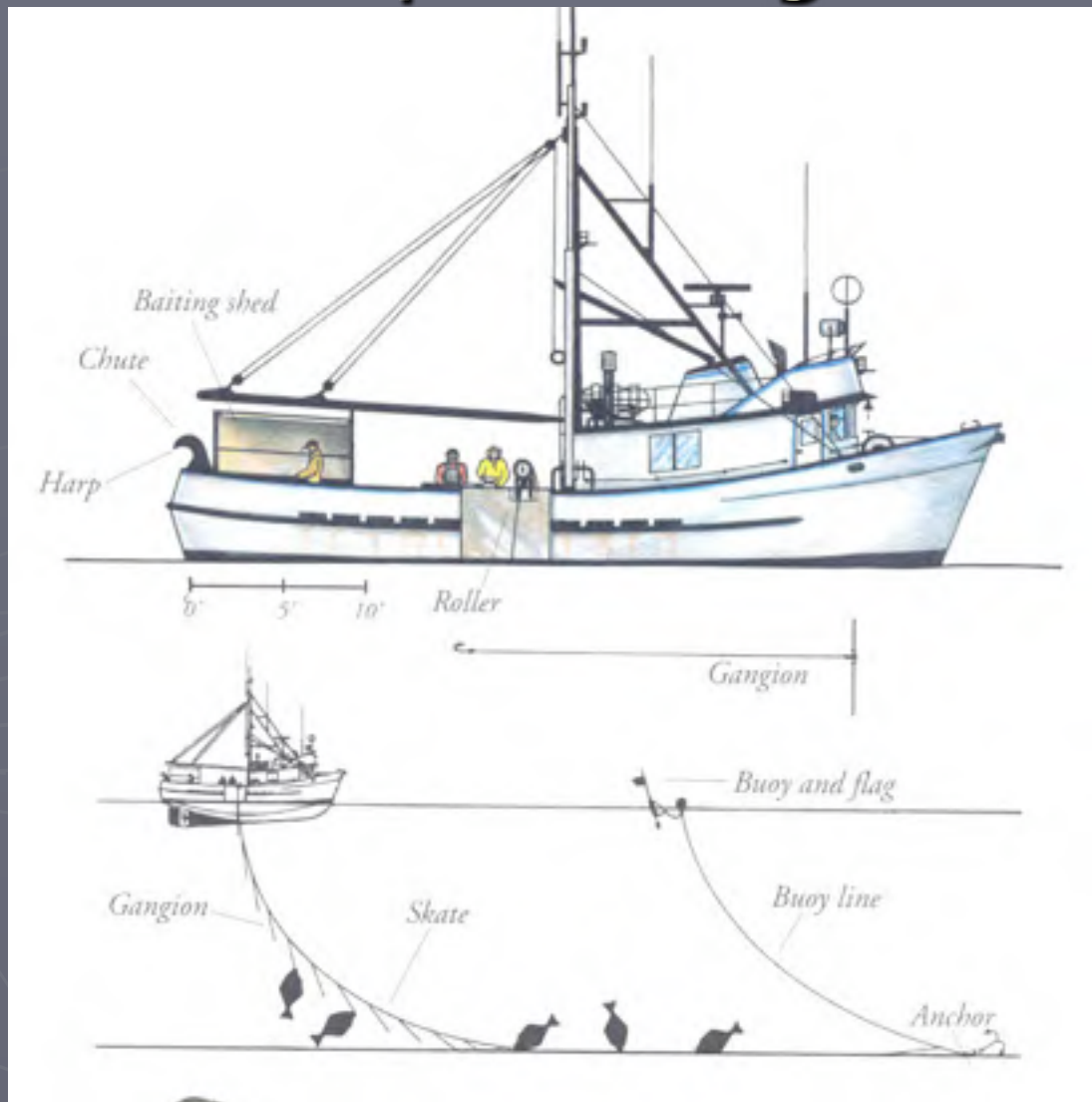


... 'though not as passive
as set gillnetting

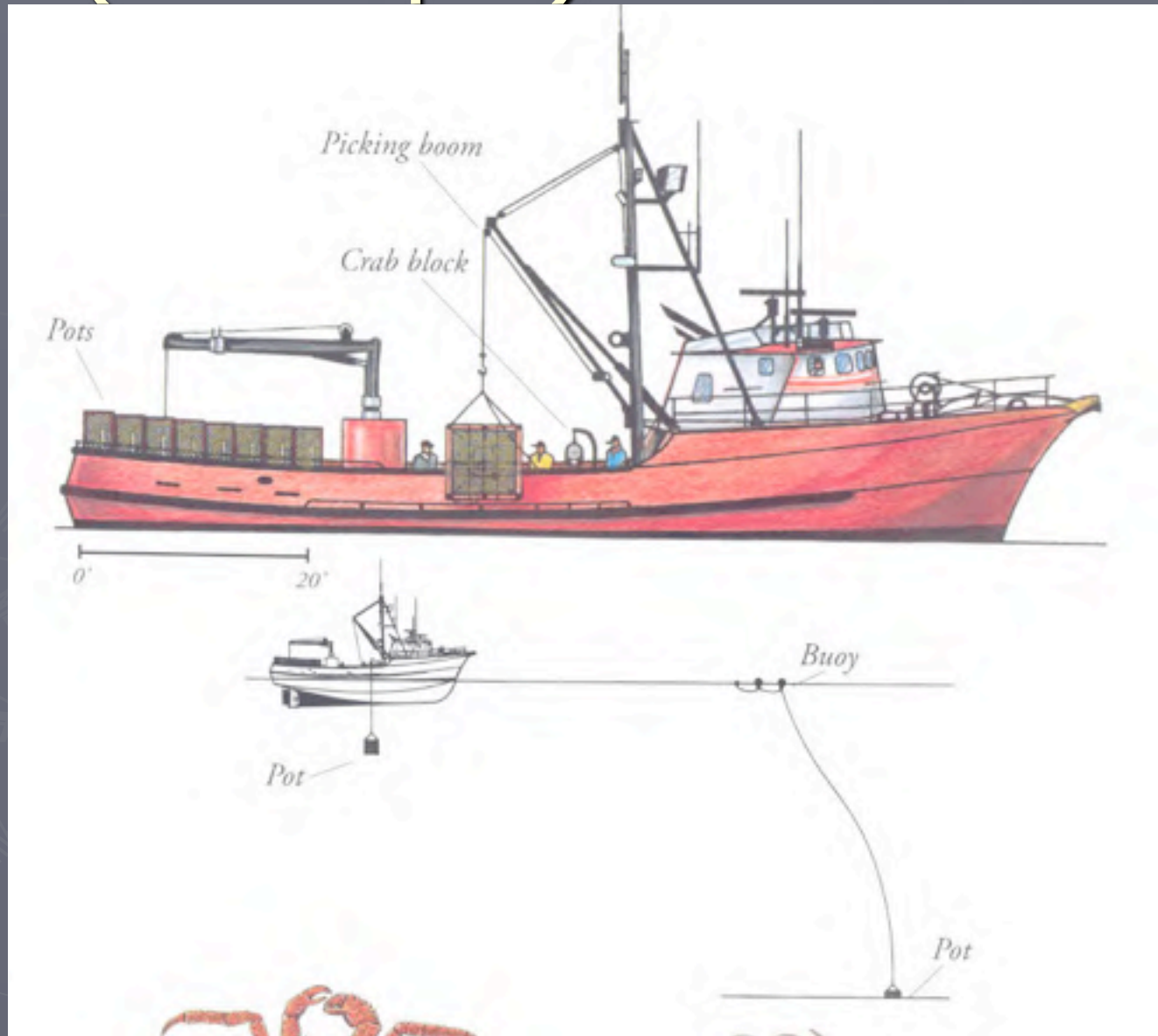


A setnet fisherman takes sockeyes
from his net in the Yakataga River.

The demersal longline (setline) is a classic passive gear



Pots (or "traps") for crab or cod



Pots used for cod, sablefish, and crab



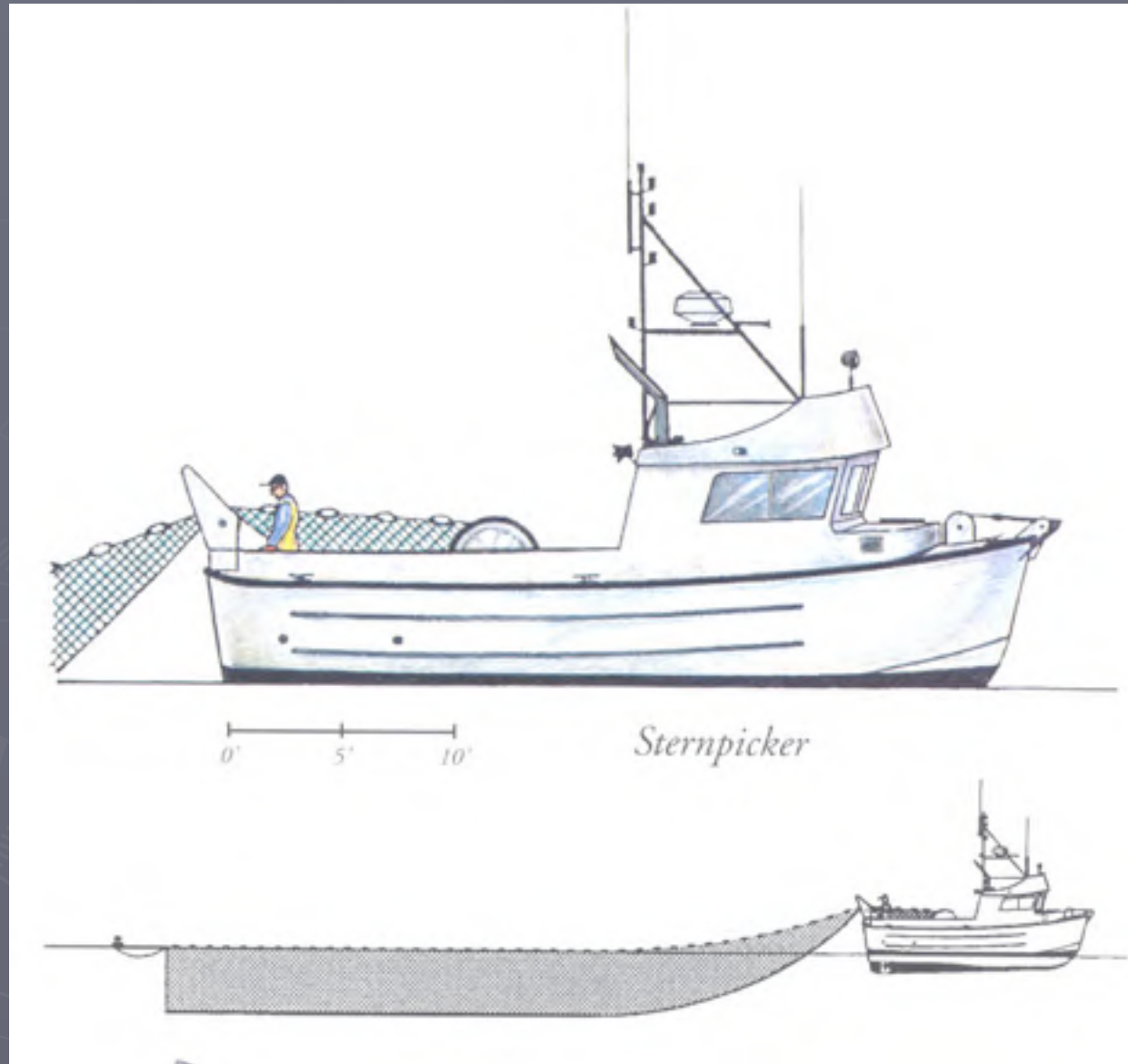
...all kinds of crab



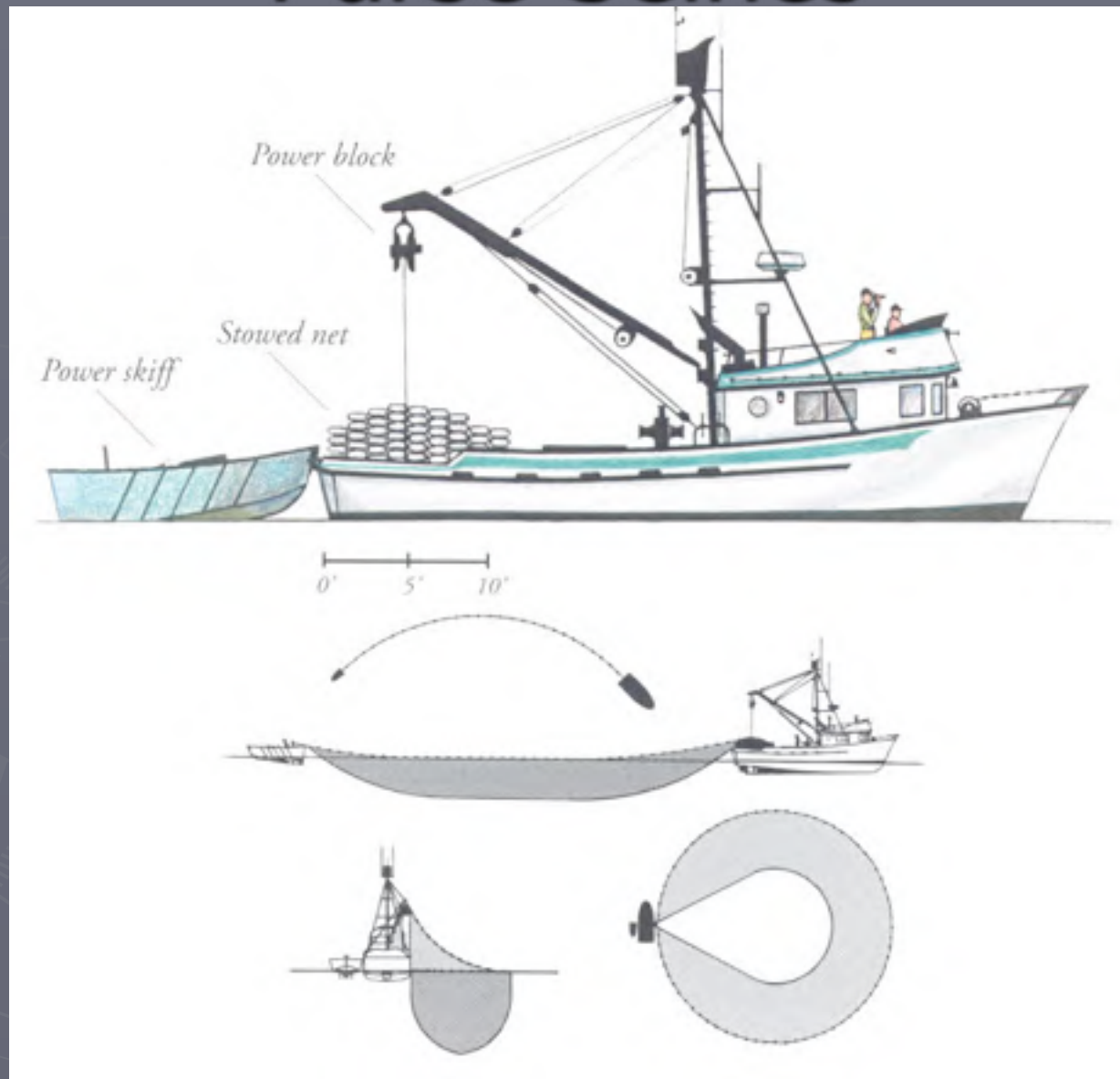
Management Implications of Active vs. Passive Gears

- ▶ Productivity
- ▶ Capital and operating costs
- ▶ Product quality
- ▶ Gear conflicts
- ▶ Space conflicts
- ▶ By-catch
- ▶ Habitat degradation

For Salmon – Gillnets



Purse Seines



Hand and Power Troll



A long-in-the-tooth troller at Wrangell sports a well-equipped business end.

For herring: seine and set gillnet



Halibut, sablefish - longlines



Draggers fish for bottomfish... ... and shrimp



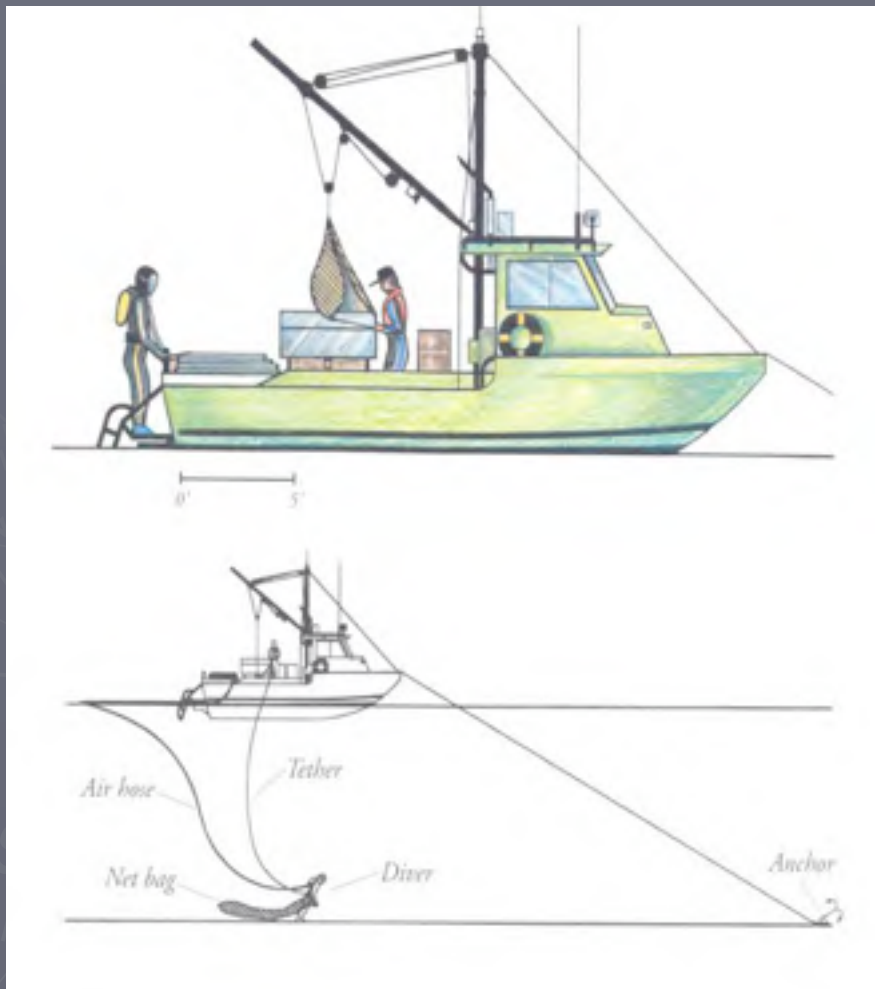
...while midwater gear takes pelagics



Jig gear takes a share



...as does dive and hand pick gear



Fishery Management Tools

- ▶ Access limitation
- ▶ Time and area
- ▶ Quota
- ▶ By-catch limits, etc.
- ▶ Gear type
- ▶ Gear quantity – number, length, depth
- ▶ Gear specifications

Some Management Objectives

- ▶ 1. Conserve stocks by allowing escape of young or undersized individuals
- ▶ 2. Slow harvest for benefit of managers
- ▶ 3. Slow harvest for harvester equity
- ▶ 4. Protect weak stocks
- ▶ 5. Prevent or reduce by-catch
- ▶ 6. Improve catch quality
- ▶ 7. Improve processing quality

Some examples of gear effects

- ▶ “Fixed” gear (longline, jig, pot) vs. trawl:
 - Reduced habitat damage
 - Reduced by-catch
 - Possibility of releasing some by-catch

- Participation by smaller vessels
- Possibly less gear conflict

Gillnet mesh size

- ▶ Can allow smaller, or larger, species to escape
- ▶ Can result in targeting ripe females
- ▶ May result in wastage due to “drop-outs”
- ▶ Problems of tooth- or lip-caught fish
- ▶ Presumed effects on stock structure
- ▶ May have quality implications (e.g. fish taken in small mesh may have less net damage)

Gillnet Mesh Size and Twine

Mesh size
= fish
size

Selective
Fishing

Twine
type



Where and when gear is deployed has many implications for sustainability and product quality

- ▶ Example: salmon district boundaries can influence oil content and skin color
- ▶ “Interception” salmon fisheries tend to produce higher quality but “mixed stock” management problems

A few observations on trawling:

- ▶ Often accused of “clearcutting” the bottom
- ▶ Much debate over harm—or benefits—of bottom gear
- ▶ Revelations of coral beds in the Aleutians have re-focused bottom trawling concerns
- ▶ By-catch issues being addressed through measures such as square mesh web, TEDs and crab excluders
- ▶ Remember, trawling has long history

Keep in mind, trawling isn't the only gear type with impact problems

- ▶ Nearly all gears have some level of by-catch
 - Economic discards
 - Seabirds or marine mammals

Most gears have some effects on the seabed or other parts of the environment

Quality can be a function of volume, handling, and processing capacity



Notes on some gears not used in Alaska

- ▶ For various historical, legal, or practical reasons, some gears are not used here
- ▶ For reasons of quality improvement, or selectivity, some are being re-considered
- ▶ Japan and Far Eastern Russia serve as examples of alternative gear use

Fixed fish traps



A floating trap in Kamchatka



Fish weir



Harvesting from a weir in Michigan



Fish wheel



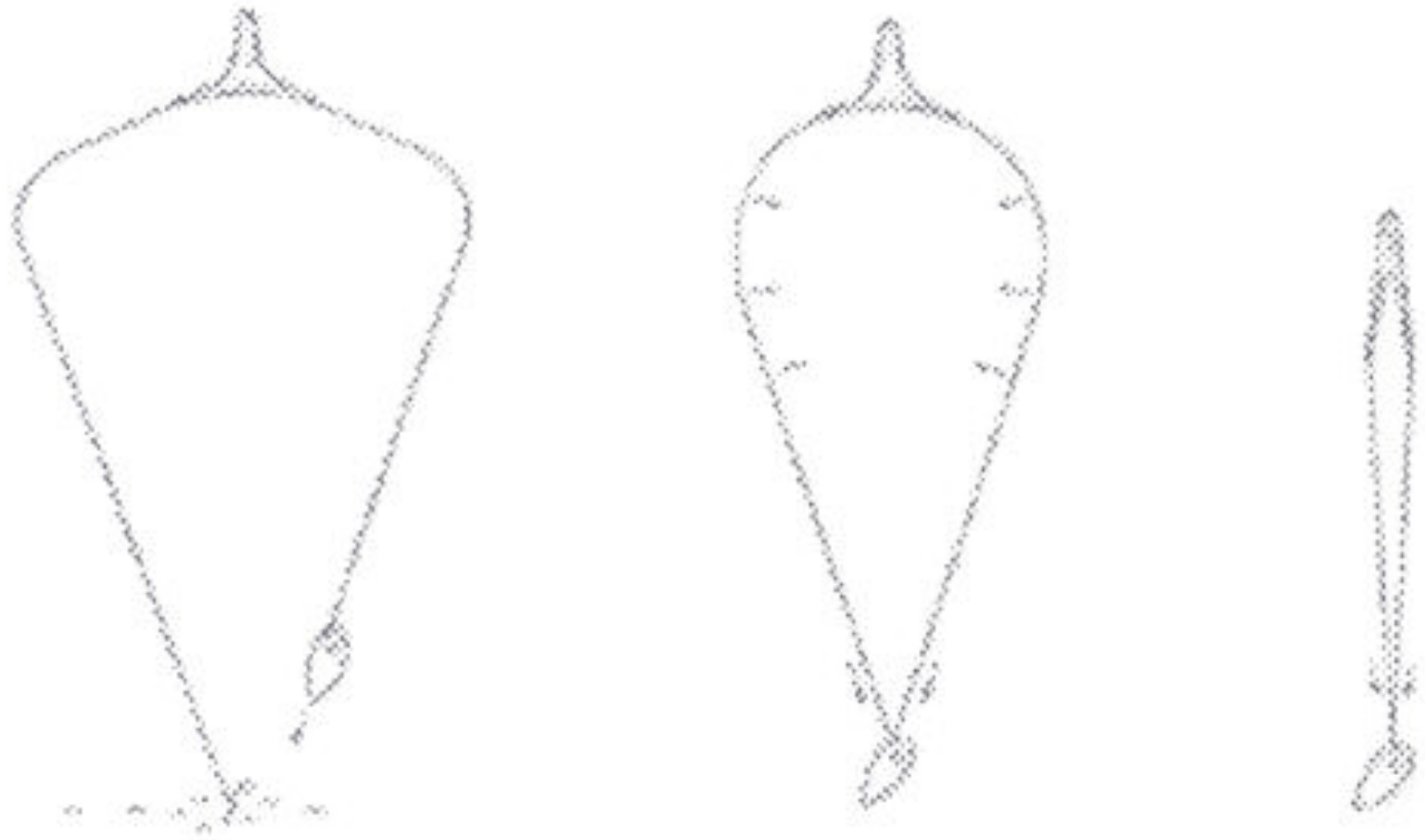
Reef net in Washington



Beach Seine



Danish, Scottish, or Fly Seine



The Future in Fishing Gears

- ▶ Most stocks are fully exploited
- ▶ Not much new gear development
- ▶ Future emphasis will be on efficiency, esp. to reduce fuel, crew costs
- ▶ May be further development of gear to reduce by-catch, increase selectivity

For more information...

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