Biological Sampling: Fishery Dependent & Independent Programs

DEPARTMENT OF ENVIRONMENTAL QUALITY

Marine Fisheries

Marine Fisheries Commission | Jacqui Degan | August 2025

Presentation Outline

- Background
- Common Questions/Misconceptions
- NCDMF Biological Sampling
  - Fishery Dependent
  - Fishery Independent

Background

- Science education

Background

- Marine Technology Program

CAPE FEAR COMMUNITY COLLEGE

- Associates in Applied Science
- Scientific support

Common Questions/Misconceptions

MYTH:

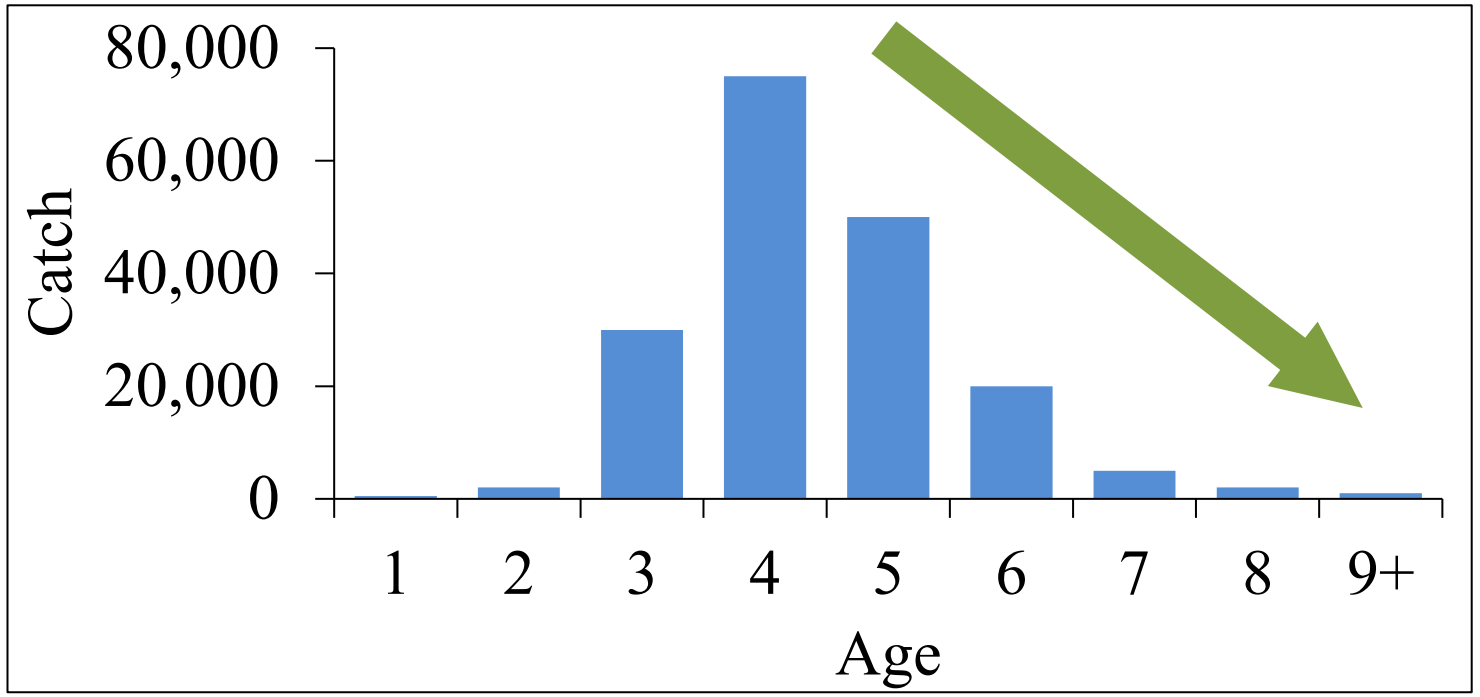
"Why should I tell fisheries what I catch?! They'll only use the data against me!"

FACTS:

- Core aim of fisheries management is to maintain fish populations at healthy levels so that everyone can continue fishing
- We can never count every individual in a fish population
- More data = better population estimates

Fisheries Dependent Data are Critical

Commercial & Recreational Fisheries → Catch at Age → Fishing Mortality



Decline in Abundance over Time & Age determines Fishing Mortality (F)

NCDMF Biological Sampling

Fishery Dependent Programs

- Trip Ticket Program
- Observer Program
- Fish House Program
- Tagging Program
- Recreational Surveys

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Fishery Dependent Programs

- Limitations:
  - No standardization
  - Locations based on maximizing catch
  - Skill key factor in success

- For these reasons, fishery dependent data is not used for tracking population trends or size of fish in population

Common Questions/Misconceptions

MYTH:

"Fisheries scientists don't know how to fish so their surveys are bunk."

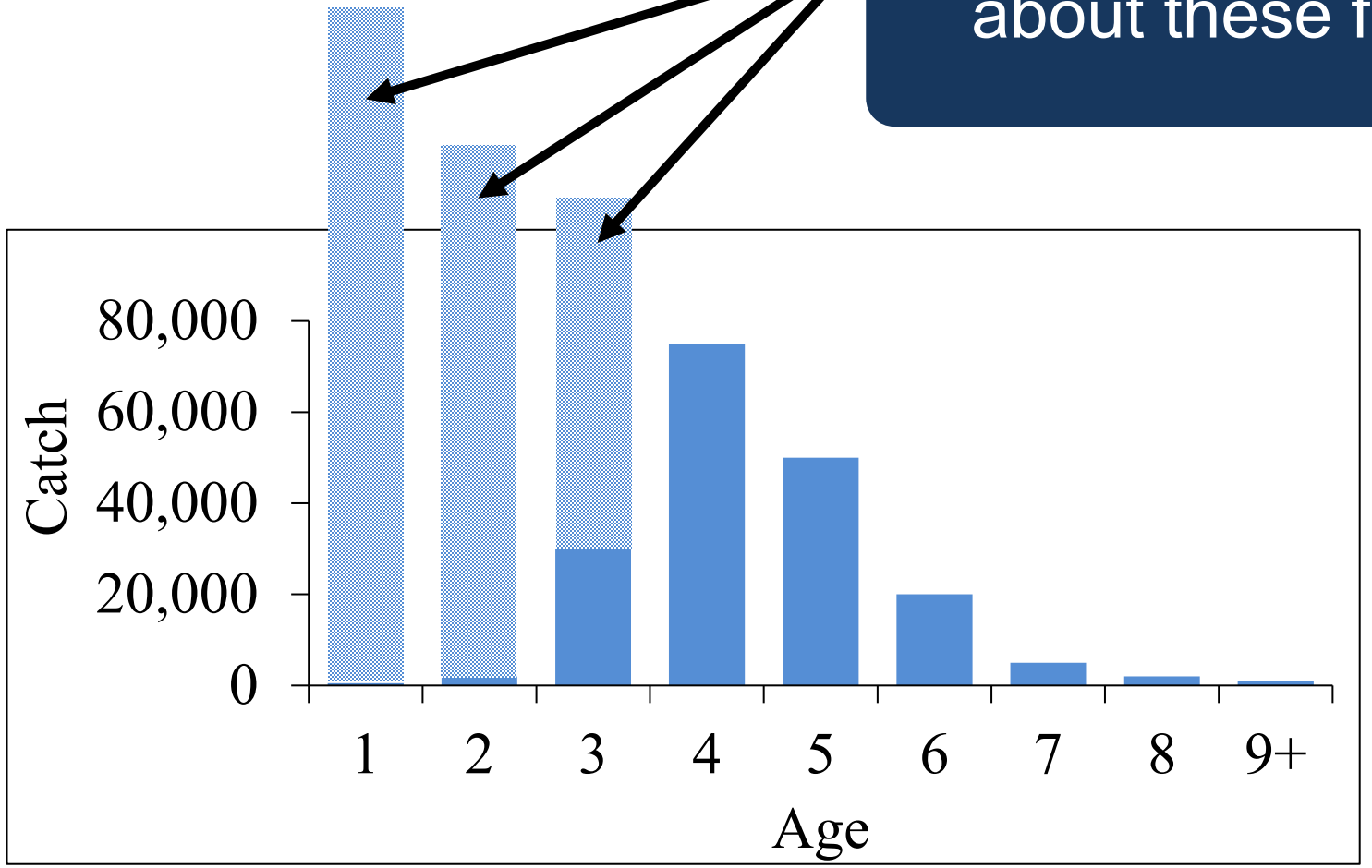
FACTS:

- Aim of fisheries surveys is to:
  - track trends in fish abundance
  - collect biological data
  - monitor habitat

- Standardized sampling protocol reduces bias

Fisheries Independent Data are ALSO Critical

Scientific Surveys tell us about these fish too!



Fisheries independent surveys can be CRITICAL to determining how factors other than fishing impact the stock

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Fishery Independent Programs

- Fixed Station Surveys

Program 120 Estuarine Trawl Survey

- Stratified Random Surveys

Program 915 Gill Net Survey

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Time
Depth
Habitat
or others

Fishery Independent Programs

- Fixed Station Surveys
  - Same stations over time
  - Standardized methods
  - Logistical and economical
- Stratified Random Surveys
  - Random stations within **strata**
  - Standardized methods
  - Station bias not an factor

Fishery Dependent and Independent Data

- Both data sources are critical to assessing stock conditions and for providing the most sound management advice

- **Fishery Dependent Data**
  - Monitor effort and removals from population
  - Characterize catch by size and age
  - Biological data (size, age, sex, maturity, genetics, diet)

- **Fishery Independent Data**
  - Track trends in abundance over time
  - Size or age structure of the population
  - Biological data (size, age, sex, maturity, genetics, diet)

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Additional considerations on sample design

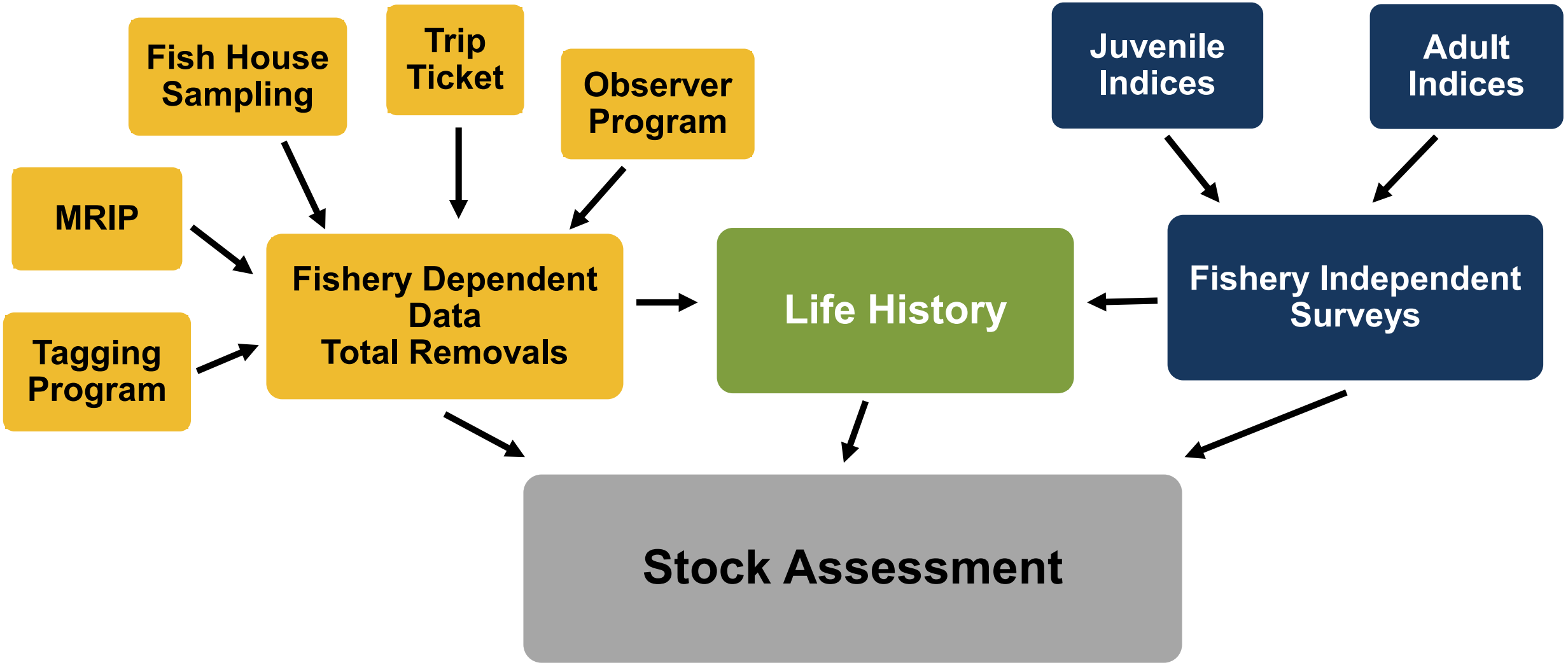
- All surveys have sampling error

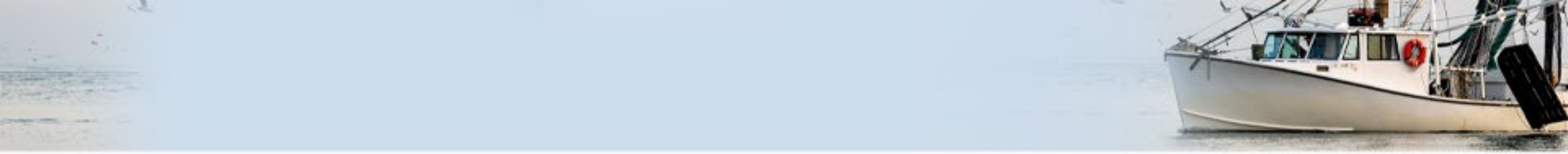
- Size of sampling error depends on:
  - Sample design
  - Sample size
  - Natural variability in population

- Larger sample sizes = greater precision
- Logistics & funding are limiting factors
- Stock assessment models allow for uncertainty as part of input

NCDMF Biological Sampling

Summary of how it all comes together:





Questions?

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