Population Biology of Monkfish: Creating a New Ageing Method

Sandy Sutherland
Fishery Biology Program

Anne Richards
Population Dynamics Branch

NEFSC, Woods Hole
NOAA Fisheries

October 4, 2017

Background

Major fishery

+

'Data-poor' species

=

Conservative management

Ageing method invalidated (2016)

- Population model can't be used

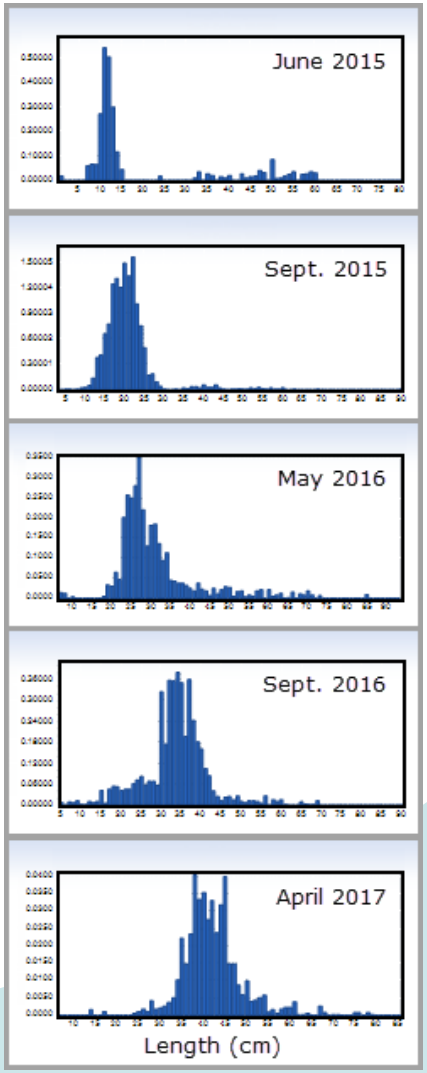
Lucky Break

Strong 2015 year-class =

'Known Age' samples

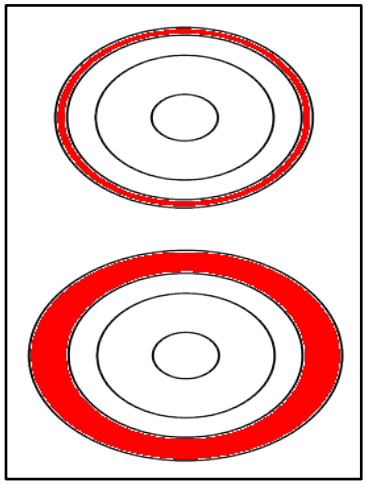
Year-class still distinct

2 years later in South



Objective:
Create new ageing method

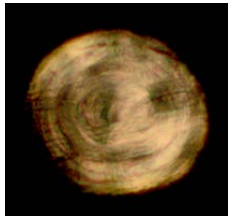
- Use ‘known age’ 2015 fish
- Compare various age structures
  - Does each structure yield expected age?
  - Are ages from the structure replicable?
- Conduct Marginal Increment Analysis
  - Measure marginal width over time
- Other validation methods



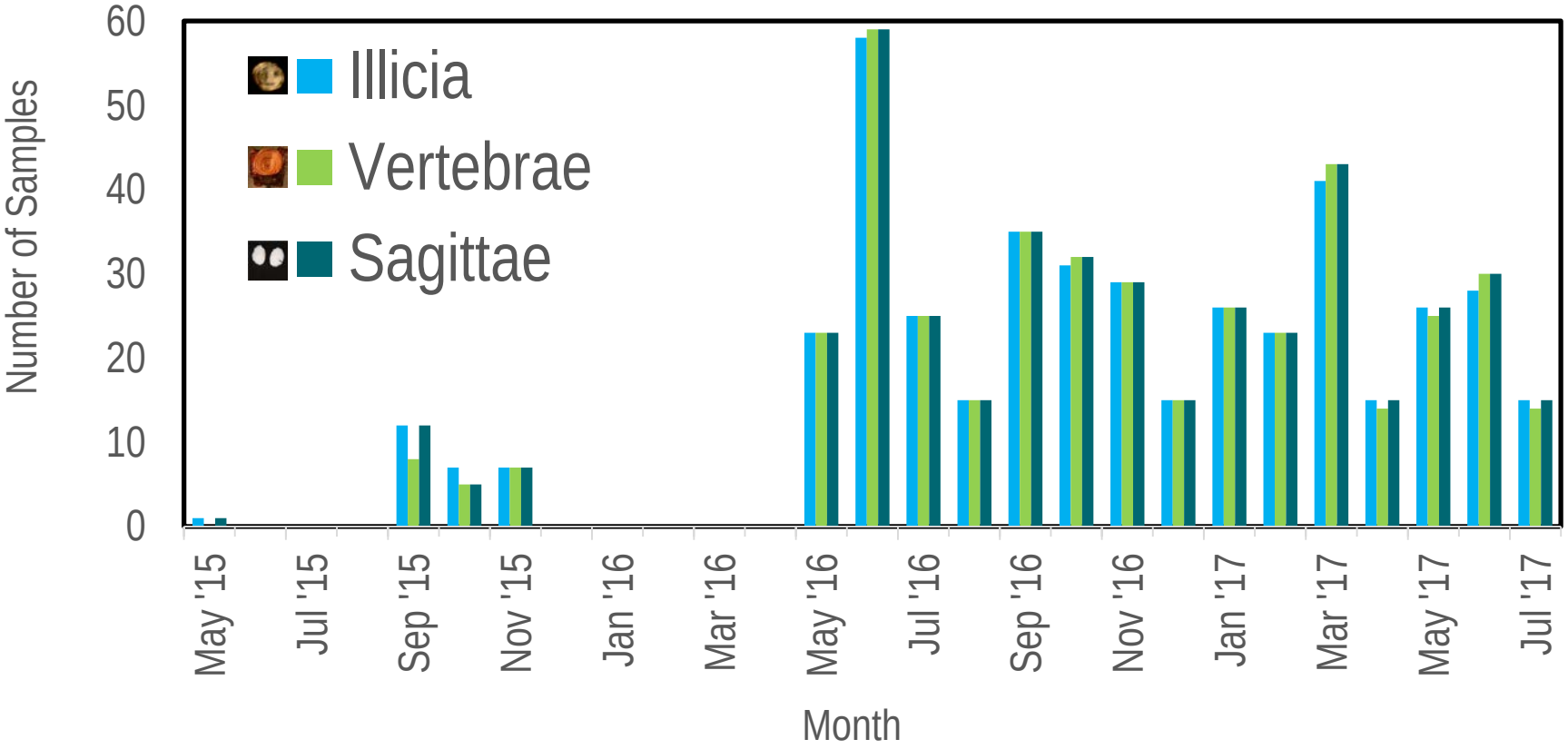
Theoretical age structure: Marginal increment width increases over time

Methods & Collaborators

- Monthly sampling from 2015 length mode
  - Study Fleet (July 2016 – July 2017)
  - Survey samples (Spring, Fall, Scallop, Shrimp, etc.)
- Dissections: Save ALL the parts
  - Illicia (1st dorsal spine, ‘fishing lure’)
  - Vertebrae (old ageing method)
  - Sagittae & Lapilli (otoliths)
- Additional sampling:
  - Livers (chemical tracers/Sandy Hook)
  - DNA samples (genetics/NYU)

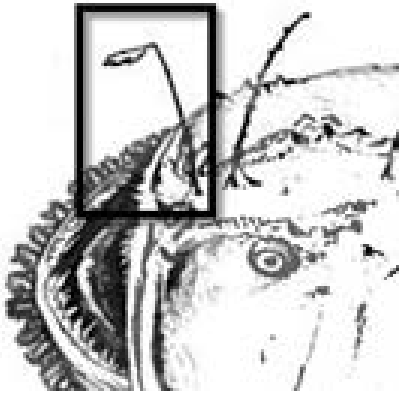


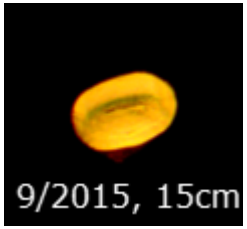
Samples Collected

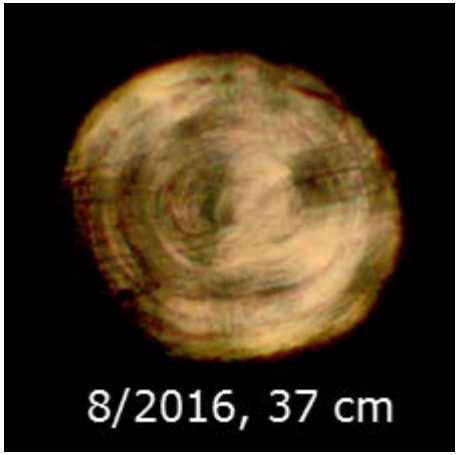


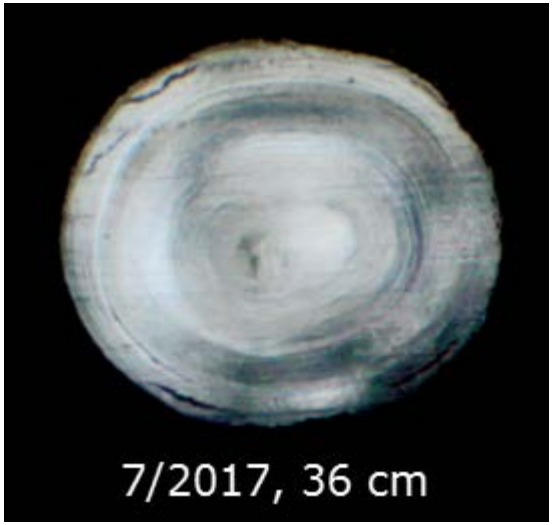
Also 120 Liver samples, 117 Lapilli, & 95 DNA samples

Illicia Ageing



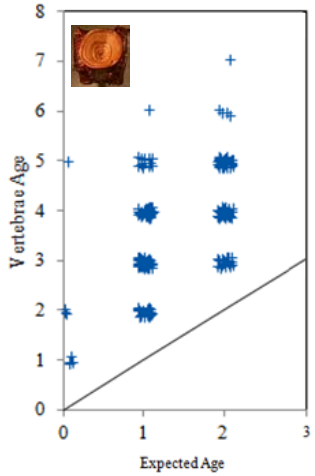






- Section 0.5 cm from base
- View at 40x magnification
- Age per methods for European species

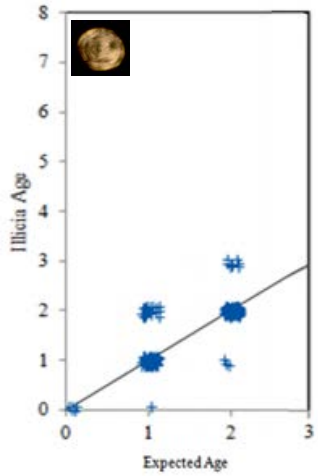
PEP 2017 student results



Vertebrae give high ages

No agreement

Slower 'growth'



Illicia look promising

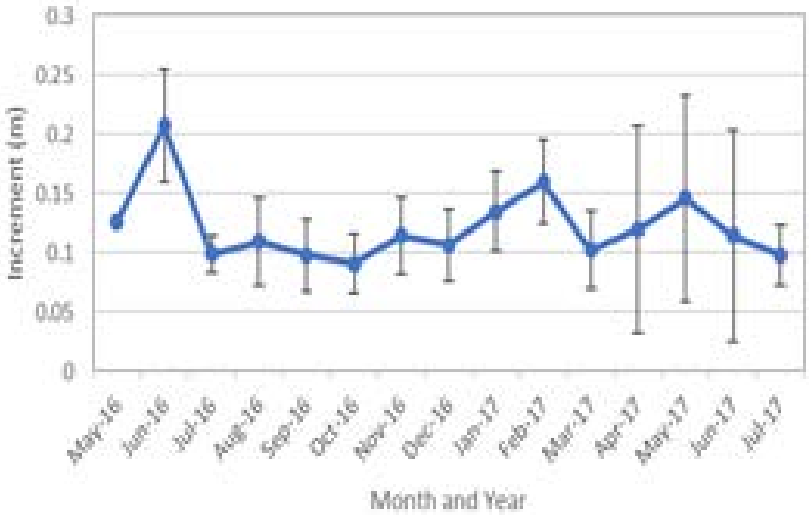
85% agreement

'Accurate'

Marginal Increment Analysis:

Possible annulus formation in May

(Preliminary data)



Thanks!

PEP Students: Alex Linares (2016)
Adrynne Jones & Matthew Durst-Scarlett (2017)

Study Fleet: F/V Bantry Bay
F/V Lisa Ann III
F/V Ocean State
F/V Virginia Marise
& Dominique St. Amand

Ecosystem Survey Branch

ME/NH Survey staff

David Secor
U. Maryland
Center for Environmental Science

Ashok Deshpande
NEFSC, Sandy Hook, NJ

Ike Wirgin
New York University

More info: Sandy.Sutherland@noaa.gov
Anne.Richards@noaa.gov