

# ASMFC Herring Spawning Closure Program Review

Technical Committee Report  
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Winter Meeting  
2/6/2018



# Technical Committee Task

- Review the efficacy of the current spawning closure method (forecasting) based on the goals and objectives of the program, and make suggestions for any improvements to better meet those objectives.

# ASMFC Herring Spawning Closure Program Objectives

- 1. Reduce interaction between fishery and spawning**
  - Impractical to *eliminate* interaction
  - Prohibit fishing when >25% of fish are spawning
- 2. Maximize spawning coverage AND access to 1A quota**
  - Greatest protection with the shortest closure
- 3. Account for inter-annual variation in spawning season**
  - Monitor development of ovaries (GSI) each year before, during, and after the spawning closure
- 4. Flexibility to extend closure, if necessary**
  - Don't open up on >25% spawning fish



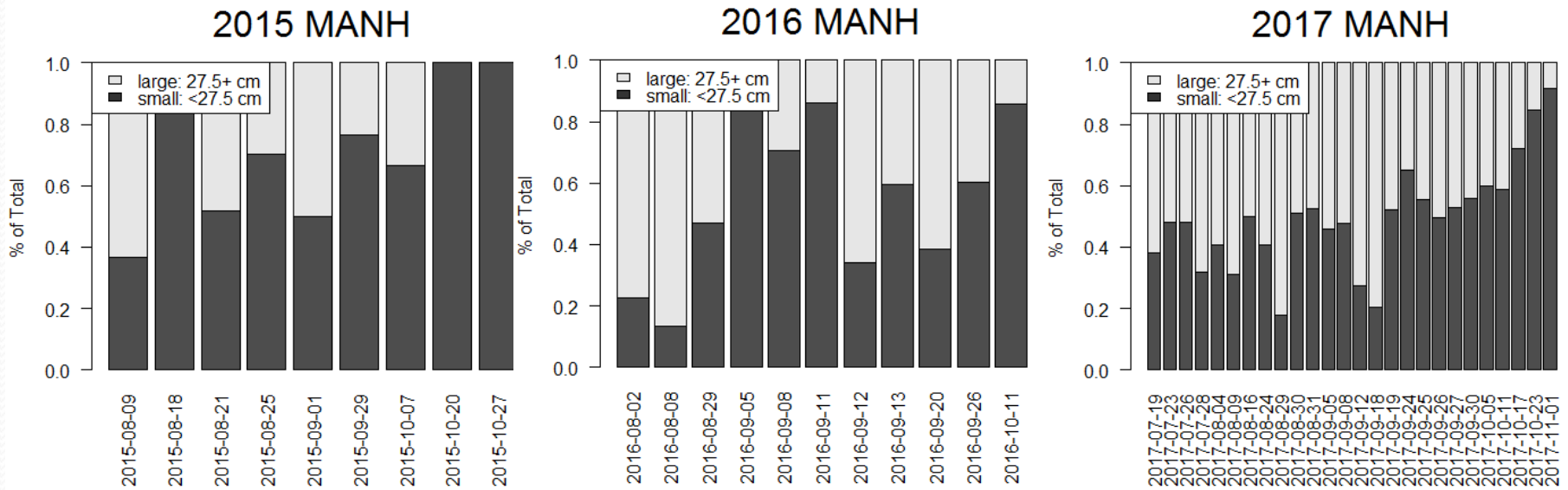
# ASMFC Herring Spawning Closure Program (Amendment 3 – 2016)

- Program Review
  - Pre-2015: Lack of data over full spawning cycle
    - Focus of sampling was collecting pre-spawning GSI
  - 2015-2017: Increased full-season sampling
    - Allows for evaluation of closure program
    - 2015: old method
    - 2016-2017: new method

# ASMFC Herring Spawning Closure Program Assumptions

- 1. Larger herring arrive & spawn earlier**
- 2. Spawning commences near  $GSI_{30cm} = 25$**
- 3. 4 weeks sufficiently covers the spawning season**
- 4. GSI increases ~linearly during last 2 months**

# 1. Do Larger Herring Arrive Earlier?



# MANH Spawning Area Mean Length of Stage 3-5 Female Herring

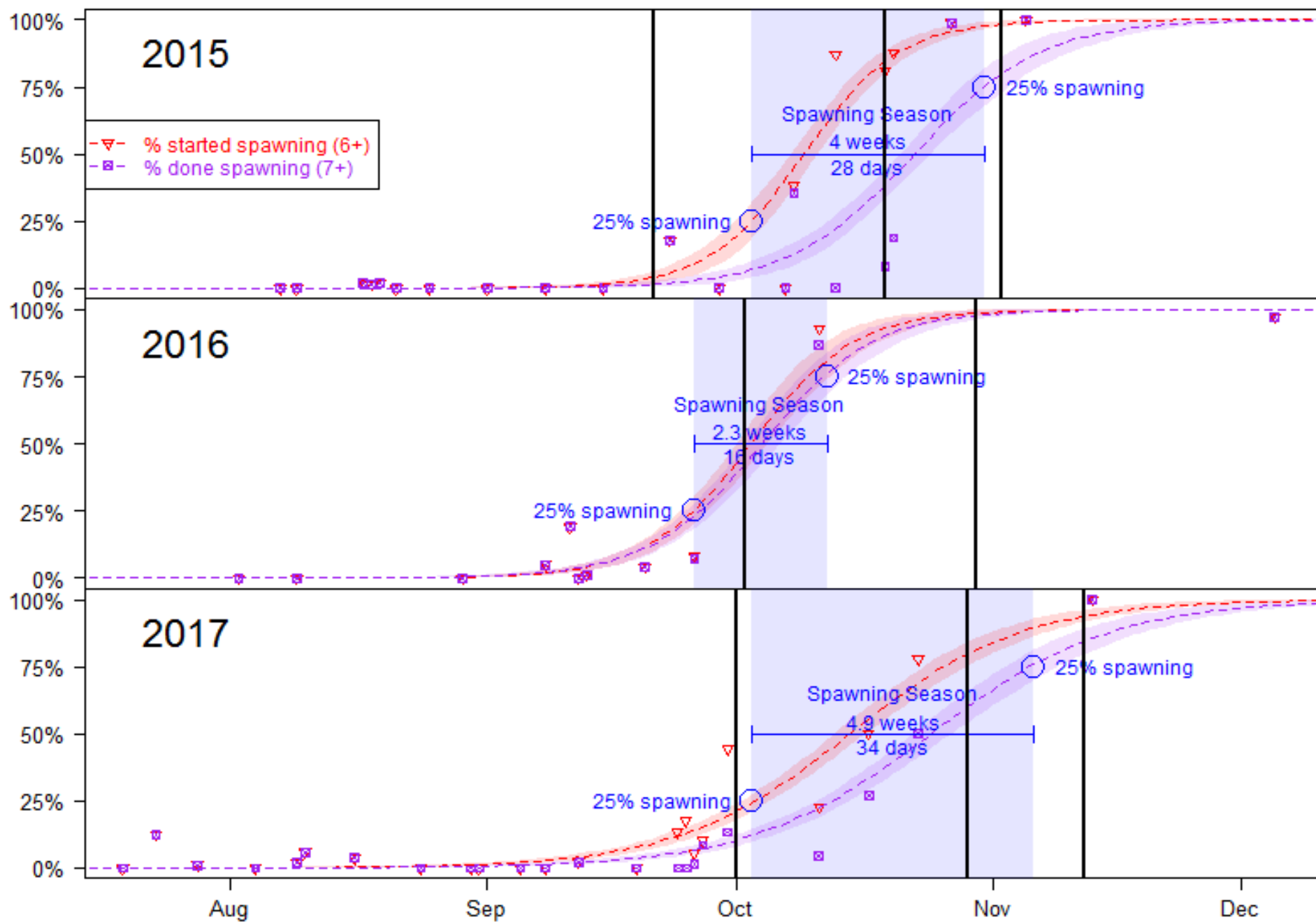


## 2. Does Spawning Commence Near $GSI_{30} = 25$ ?

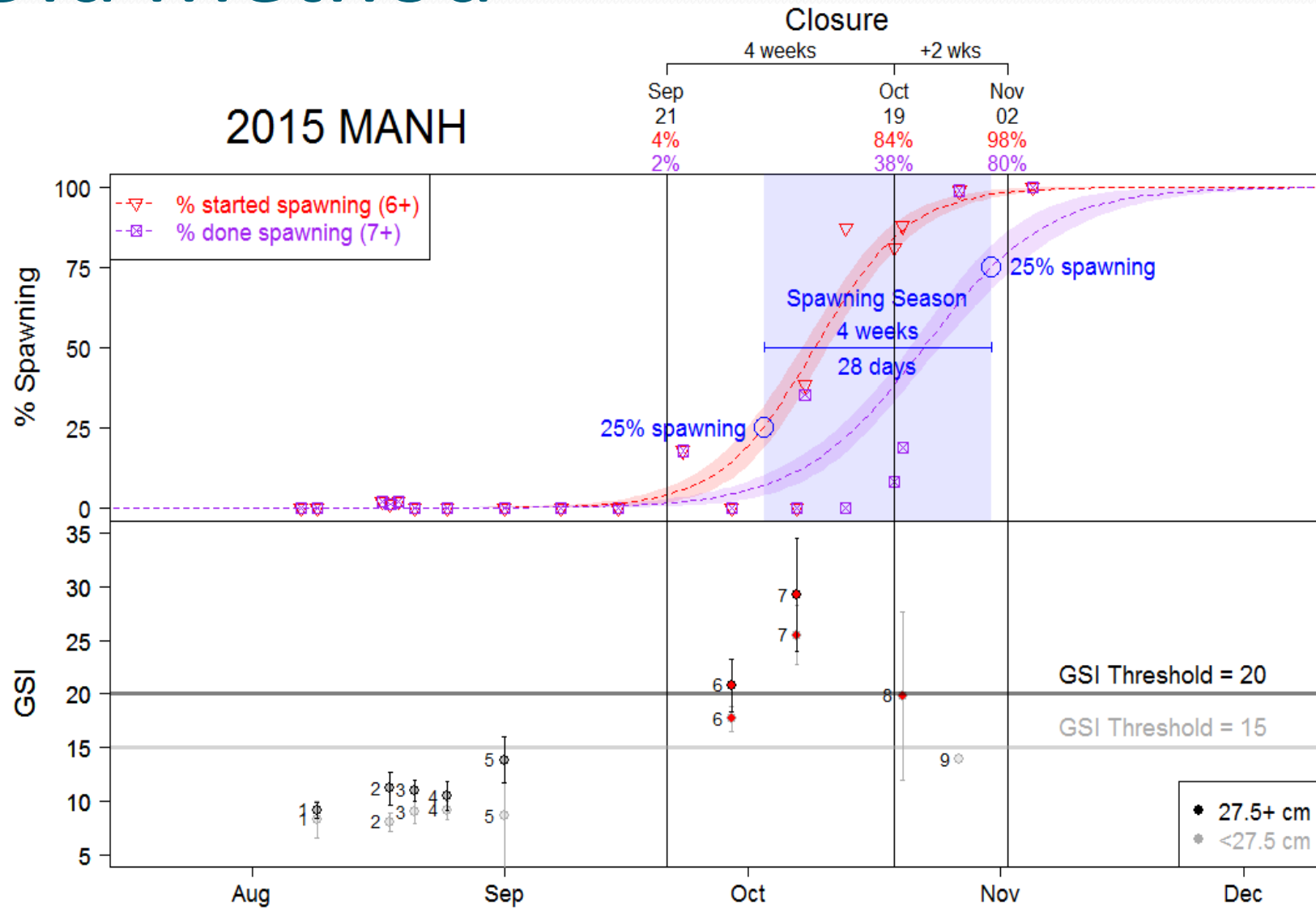
- When is the spawning season?





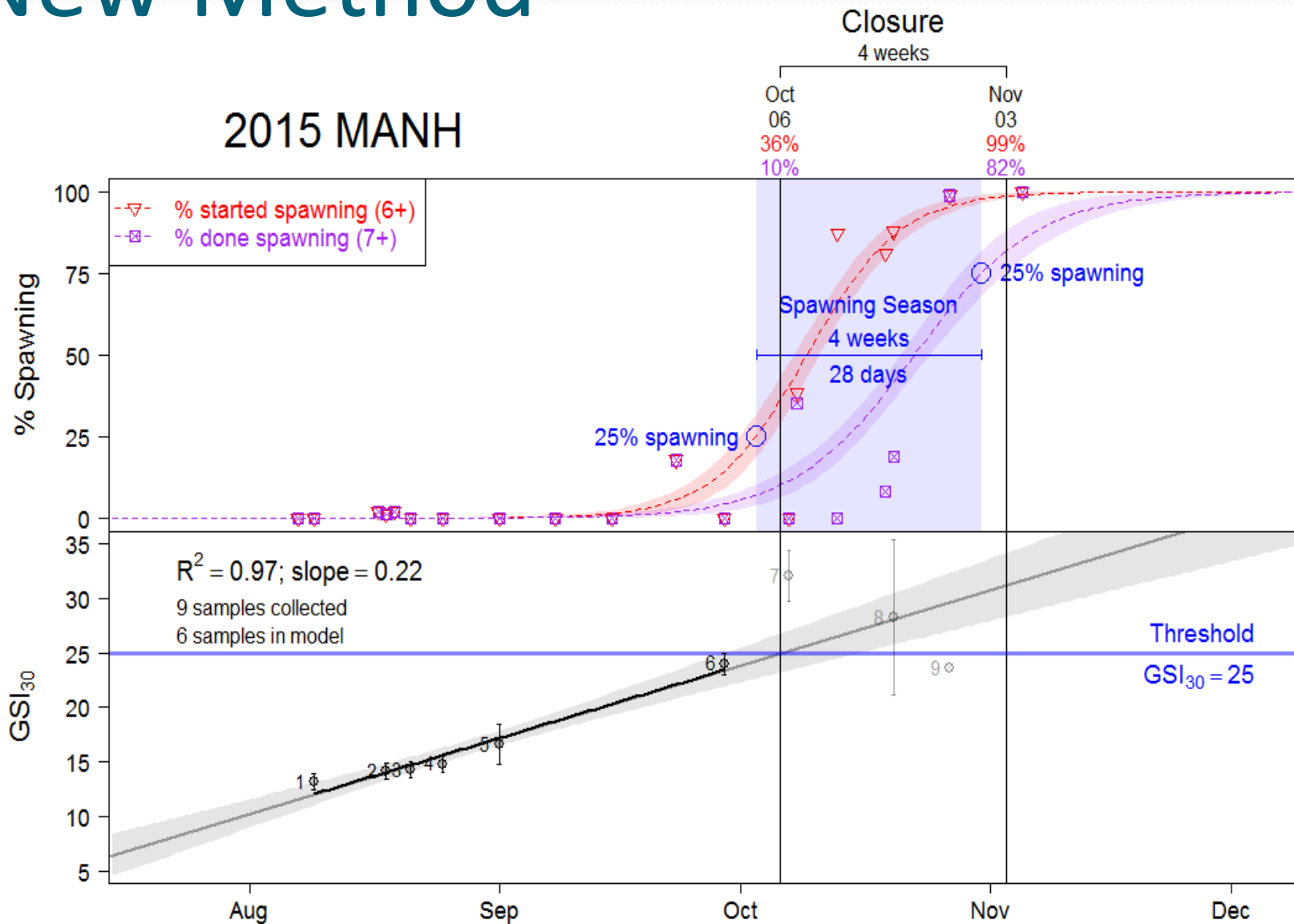


# Old Method



# New Method

2015 MANH

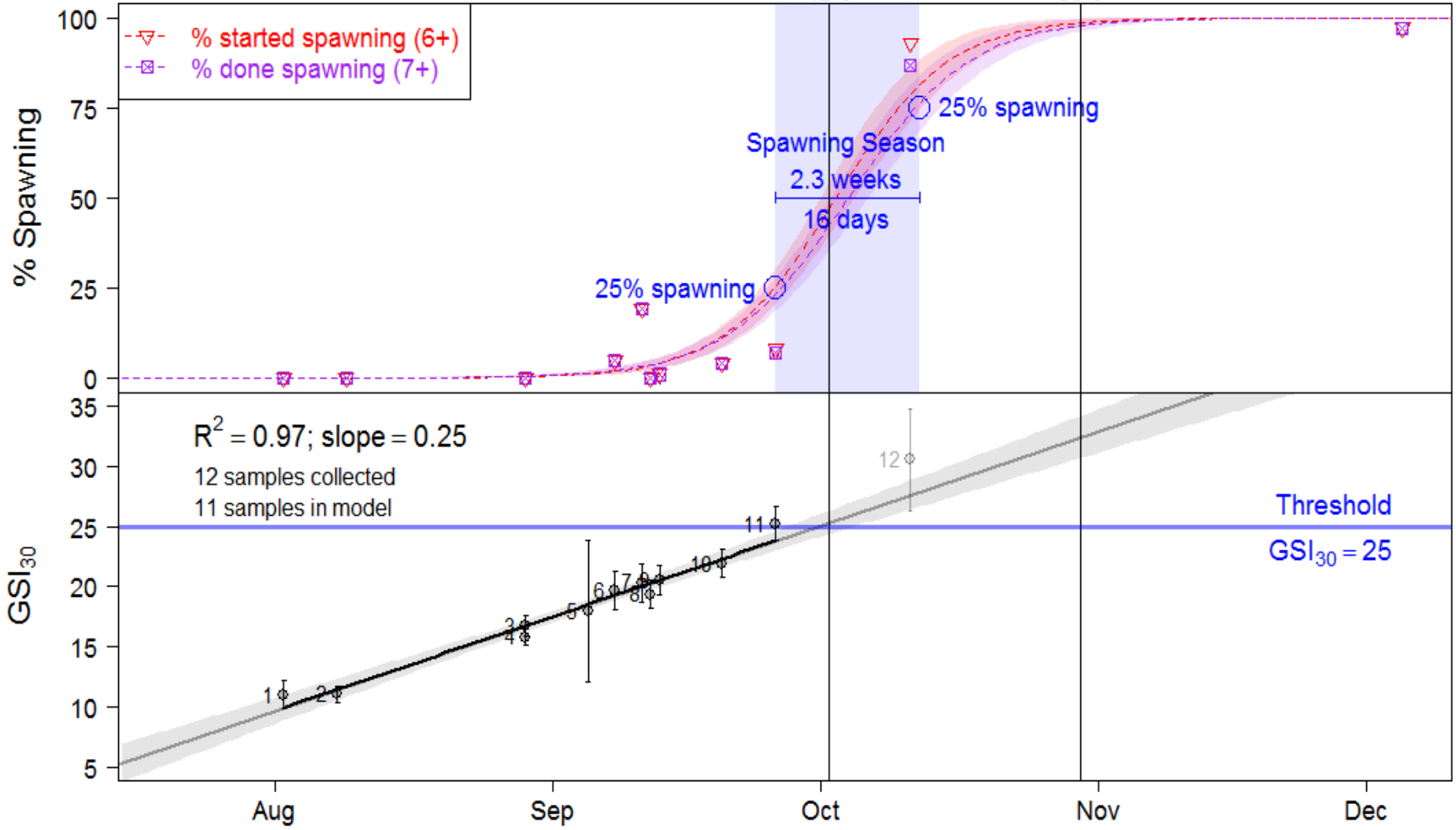


# 2016 MANH

Closure

4 weeks

Oct 02	Oct 30
47%	99%
42%	98%



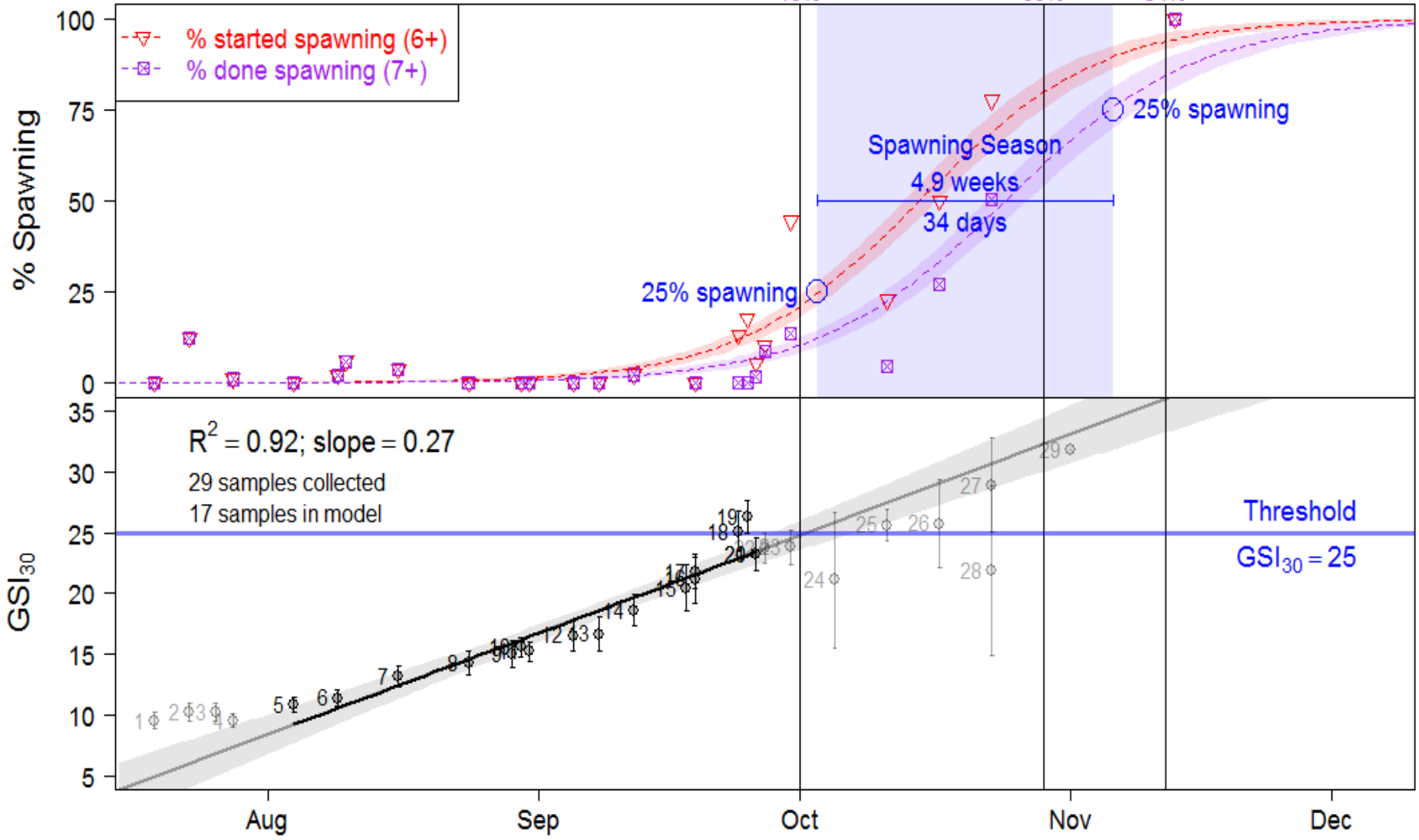
**\*\*Very low sample size during and after spawning closure\*\***

# 2017 MANH

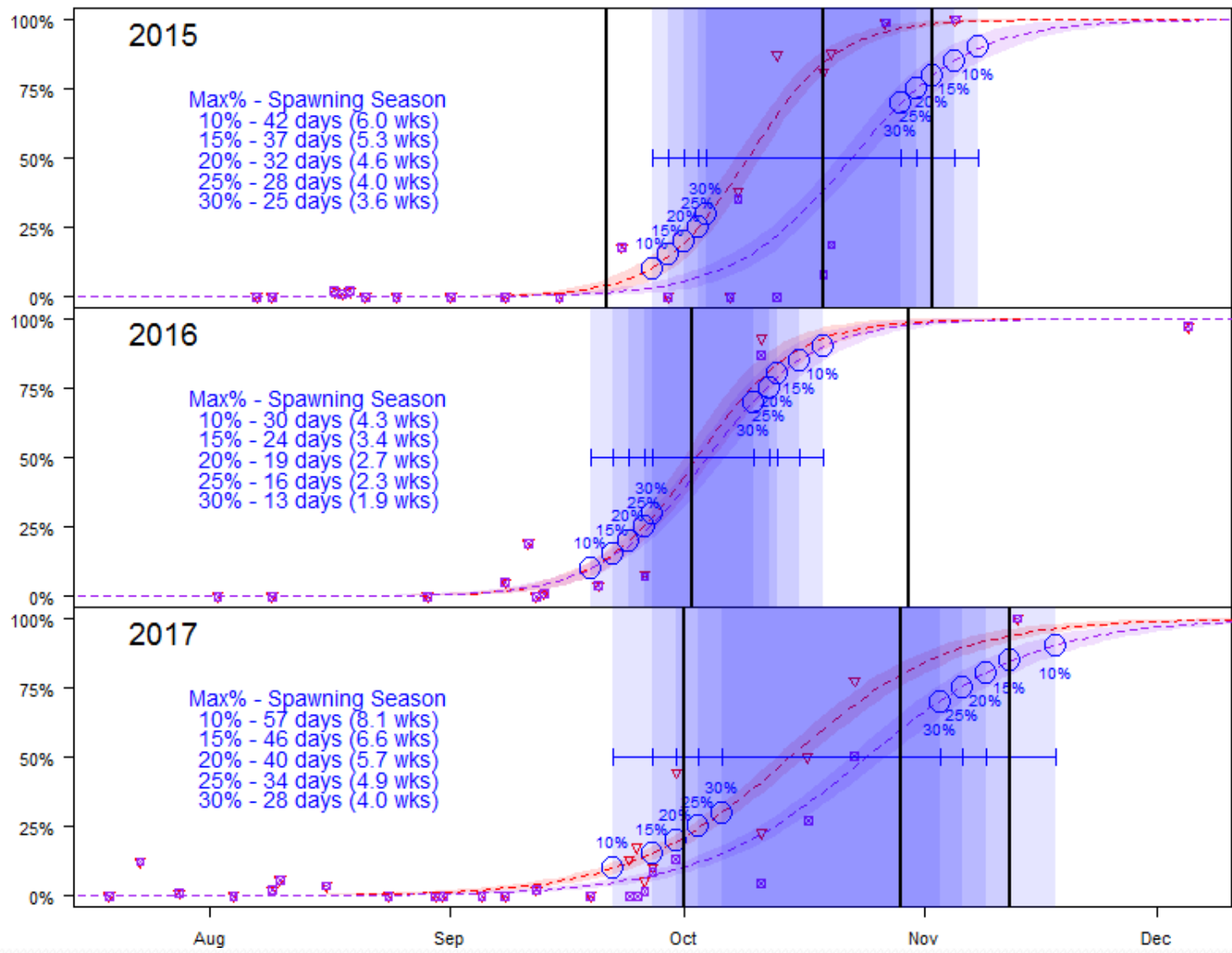
## Closure

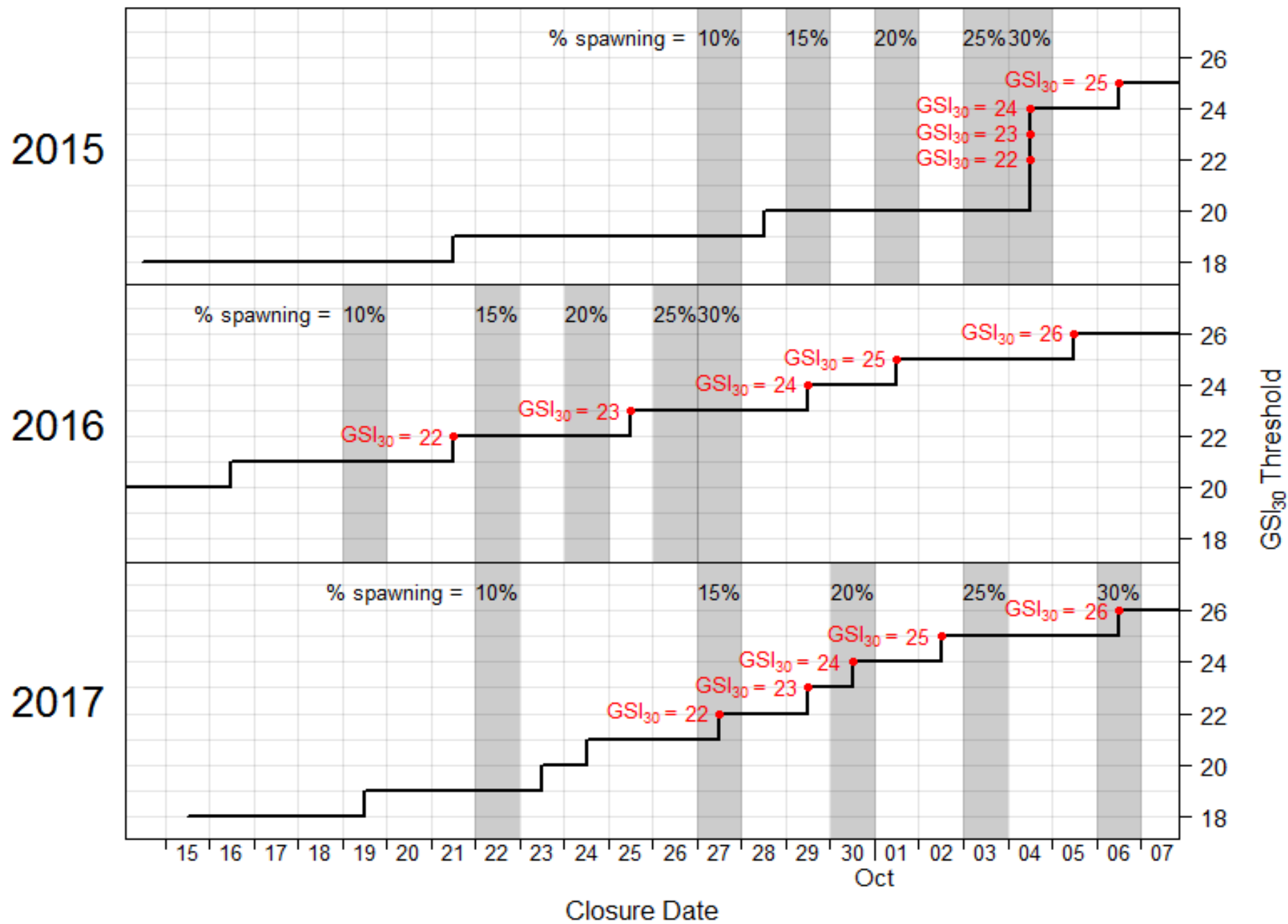
4 weeks +2 wks

Oct 01	Oct 29	Nov 12
21%	80%	94%
10%	60%	84%



# 3: Is a Four Week Closure Sufficient?



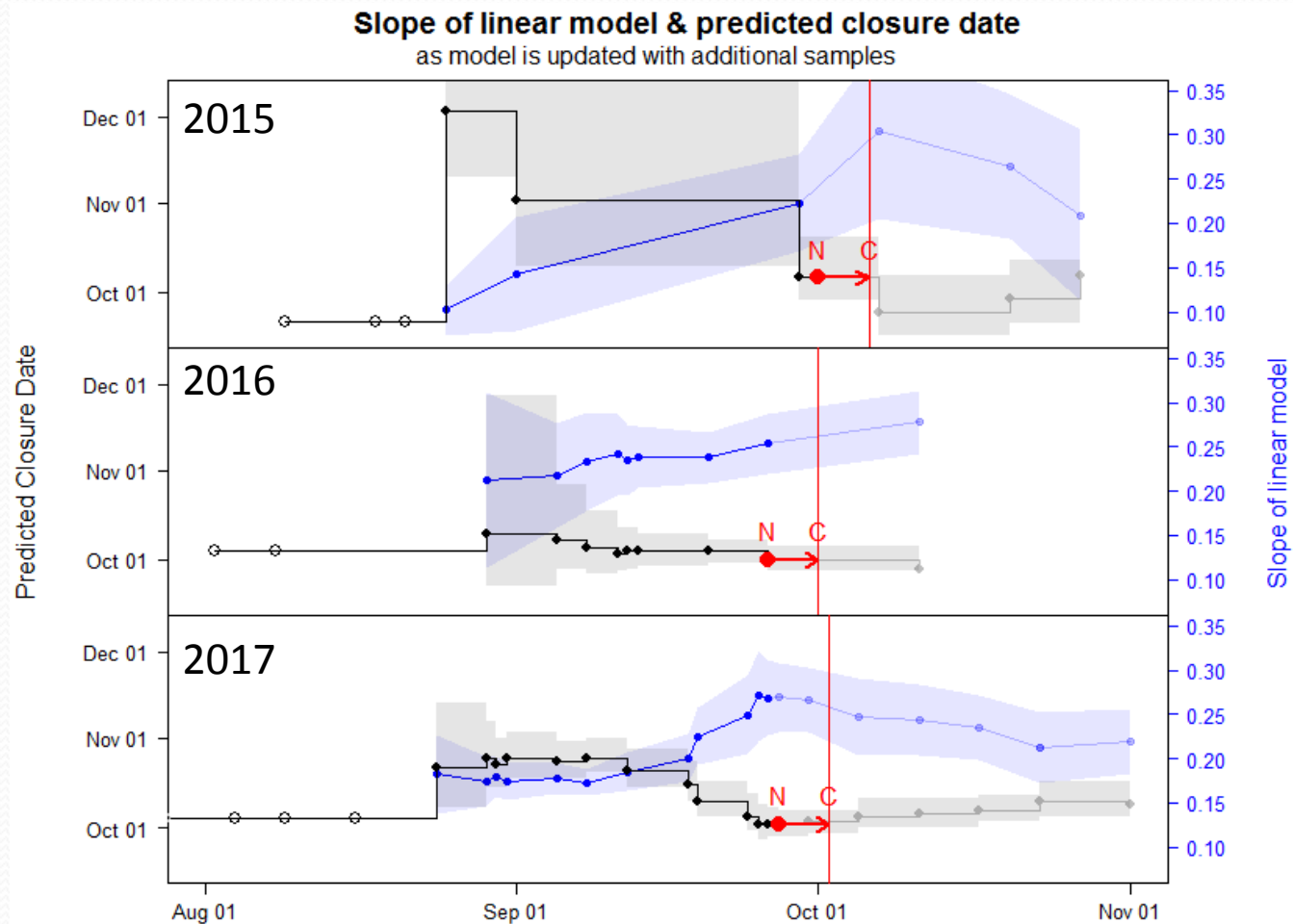




# Default Dates at Different GSI30 Thresholds

GSI <sub>30</sub> Threshold	Default Date		
	MANH	WM	EM
26	Oct-6	Oct-6	Aug-28
25	Oct-1	Oct-1	Aug-28
24	Sep-27	Sep-27	Aug-28
23	Sep-23	Sep-23	Aug-28
22	Sep-19	Sep-19	Aug-28

# 4. Does GSI Increase Linearly During the Last Two Months Prior to Spawning?





# Conclusions and Recommendations

- Current spawning closure model appears to be meeting the Section's objectives



# Conclusions and Recommendations

- Spawning season is variable
  - 2015: 28 days
  - 2016: 16 days (low sample size)
  - 2017: 34 days
  - Two week re-closure may occur frequently
  - 5 or 6 week closure could reduce frequency of re-closure



# Conclusions and Recommendations

- The current GSI<sub>30</sub> threshold of 25 is a good fit to the spawning season
  - Within days vs weeks
  - Section could consider a threshold of 23 or 24 to reduce probability of greater than 25% spawning fish in each catch
    - Earlier default date
    - Increased likelihood of re-closure if a 4 week spawning closure is retained



# Conclusions and Recommendations

- Fishery independent sampling is needed during closures
  - Eastern Maine and Western Maine