

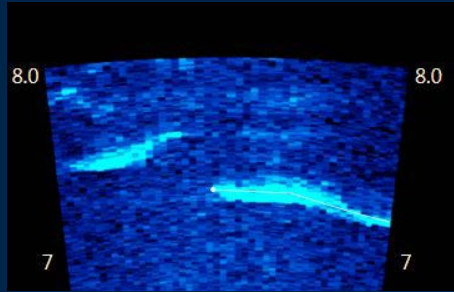
# Escapement Goals for Kenai River King Salmon 75 cm and Longer

A Presentation to the Alaska Board of Fisheries  
Upper Cook Inlet Finfish Meeting  
February 23, 2017



Steve Fleischman  
Division of Sport Fish  
Anchorage

**RC 4**  
**Tab 6**



# Escapement Goals for Kenai River King Salmon 75 cm and Longer

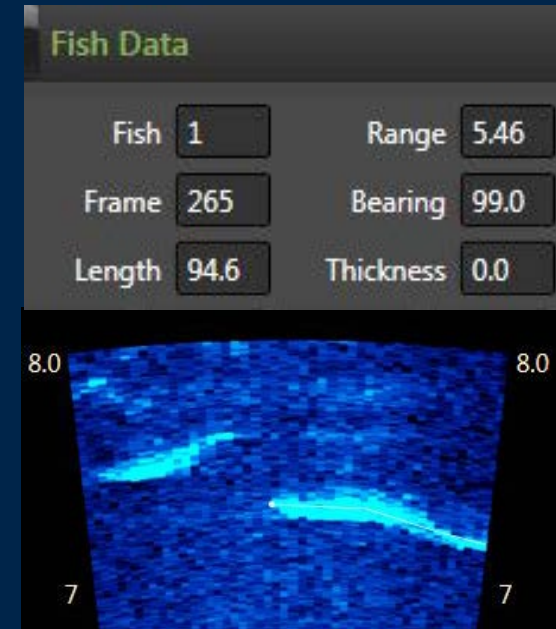
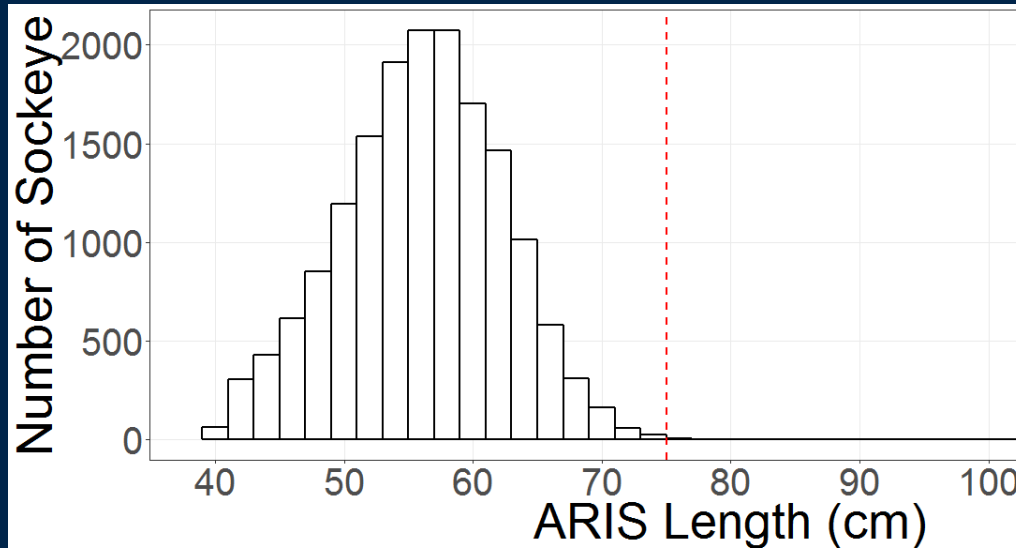
- 1) Why size-based goals?
- 2) How did we choose the goals?
- 3) How will size-based goals affect management?

# Kenai King Salmon Sonar in Transition

- 2010 DIDSON fully installed at RM 9
- 2011-12 nearshore kings discovered
- 2013 goals based on expanded RM-9 counts
- 2013 installed ARIS at RM 14
- 2015-16 manage with RM-14 ARIS
- 2017 manage based on kings 75 cm and longer



# Why 75 cm?

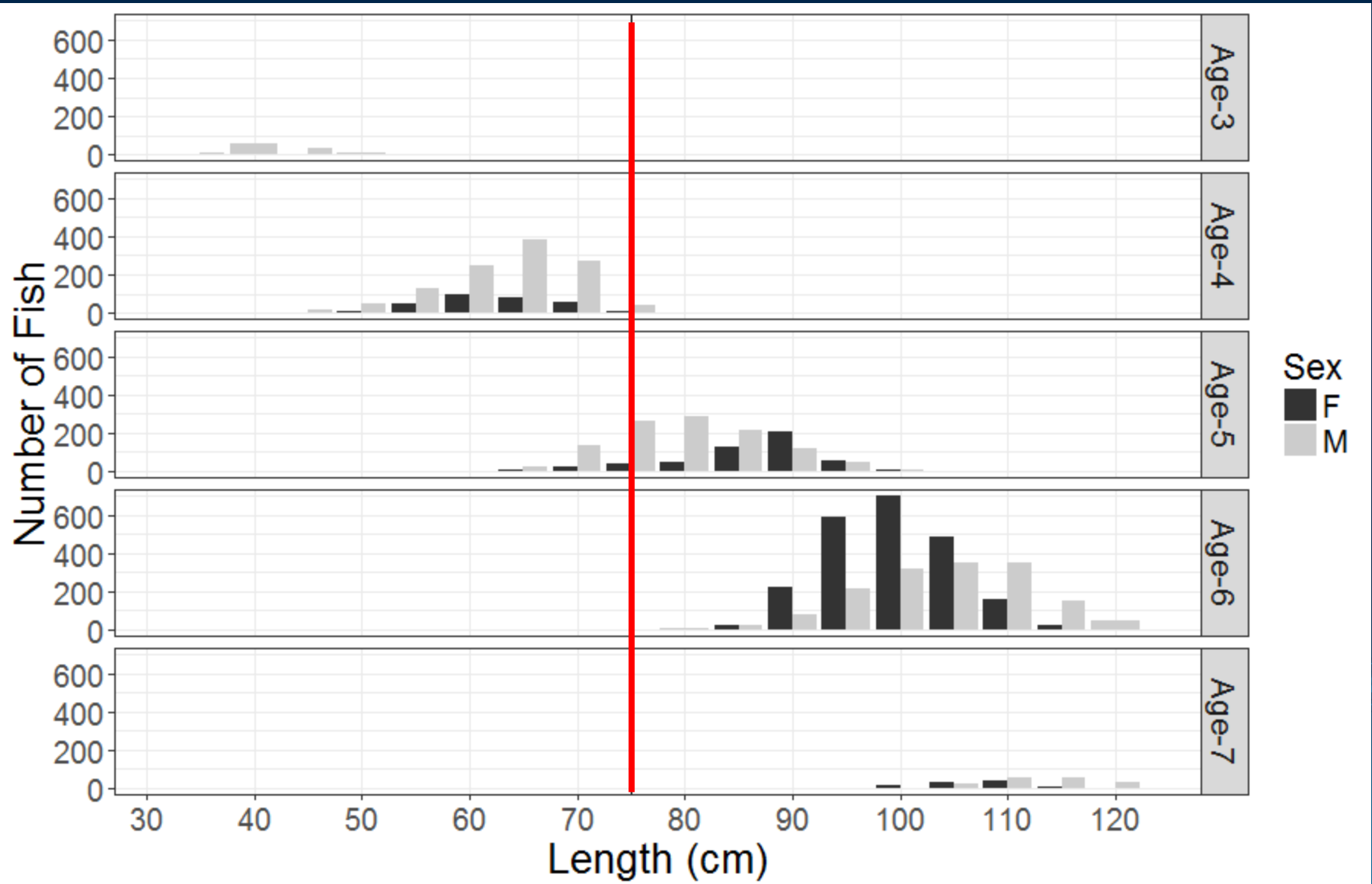


- Nearly all sockeye salmon are less than 75 cm long *as measured by the ARIS.*
- Nearly all fish measured 75 cm or longer *by the ARIS* are king salmon.
- 75 cm ARIS length = 75 cm METF = 33.3 in total length

# Why size-based goals?

- 1) King salmon 75+ cm can be counted directly from sonar images
- 2) King salmon 75+ cm include the vast majority of females

# Late Run King Salmon Length by Age, Sex



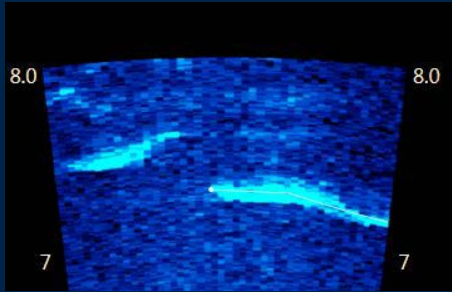
# Estimates of Small King Salmon

- Sonar and netting data required
- Subject to improvement
- Poorly suited for inseason management

Fleischman, S.J. and A.M. Reimer. 2017. Spawner-Recruit Analyses and Escapement Goal Recommendations for Kenai River Chinook Salmon

**(RC 4 Tab 2) page 38**

# Escapement Goals for Kenai River King Salmon 75 cm and Longer



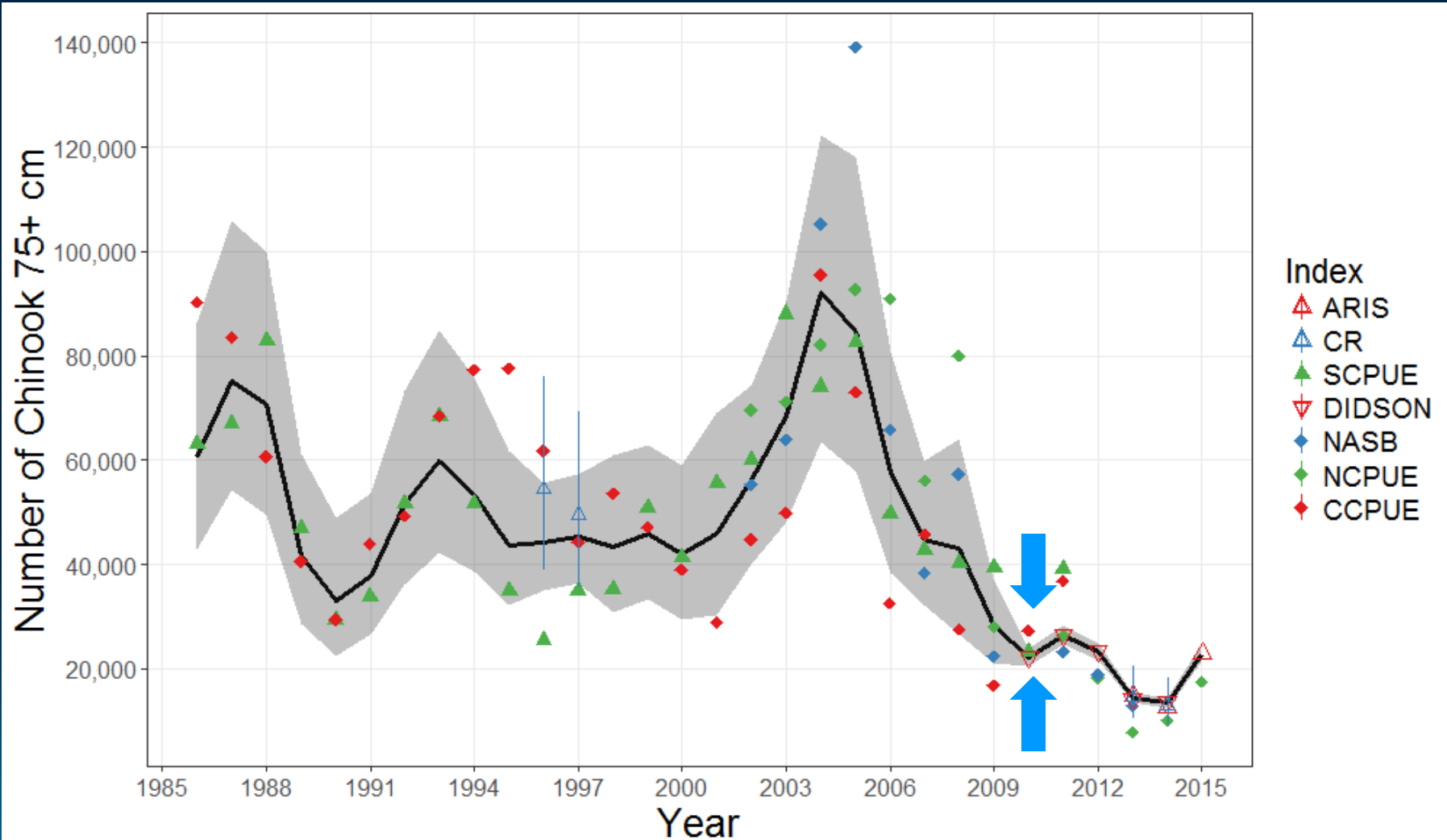
- 1) Why size-based goals?
- 2) How did we choose the goals?
  - Analysis
  - Goal selection
- 3) How will size-based goals affect management?



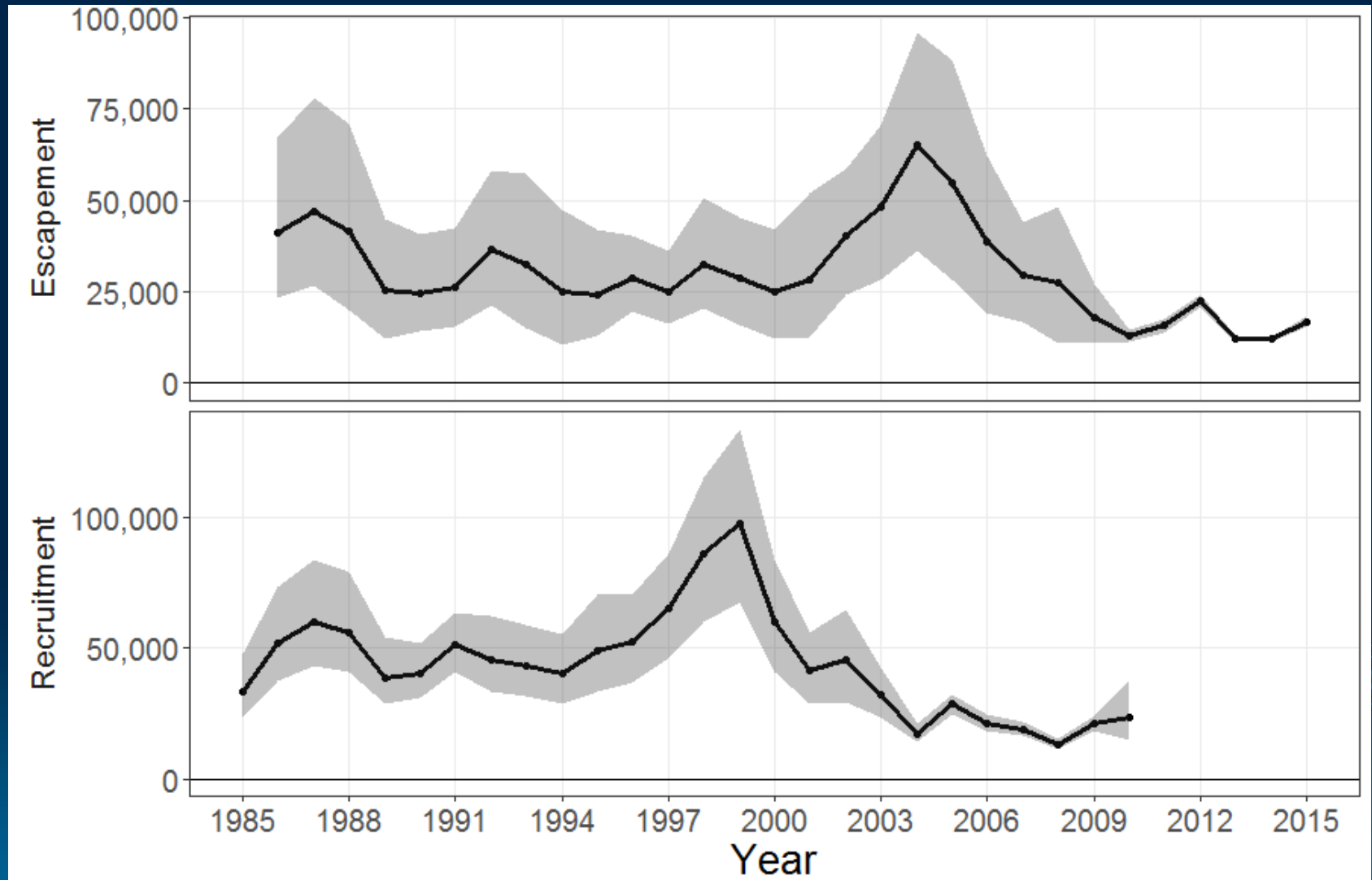
# Improved Analysis

- Methods – unchanged from 2013
  - Use all data; best data receive more weight
  - Uncertainty assessed
  - Extensively reviewed
- Data - improved
  - 2013-2015 data most precise yet
  - Large fish data are more accurate
  - Paired abundance estimates agree very well

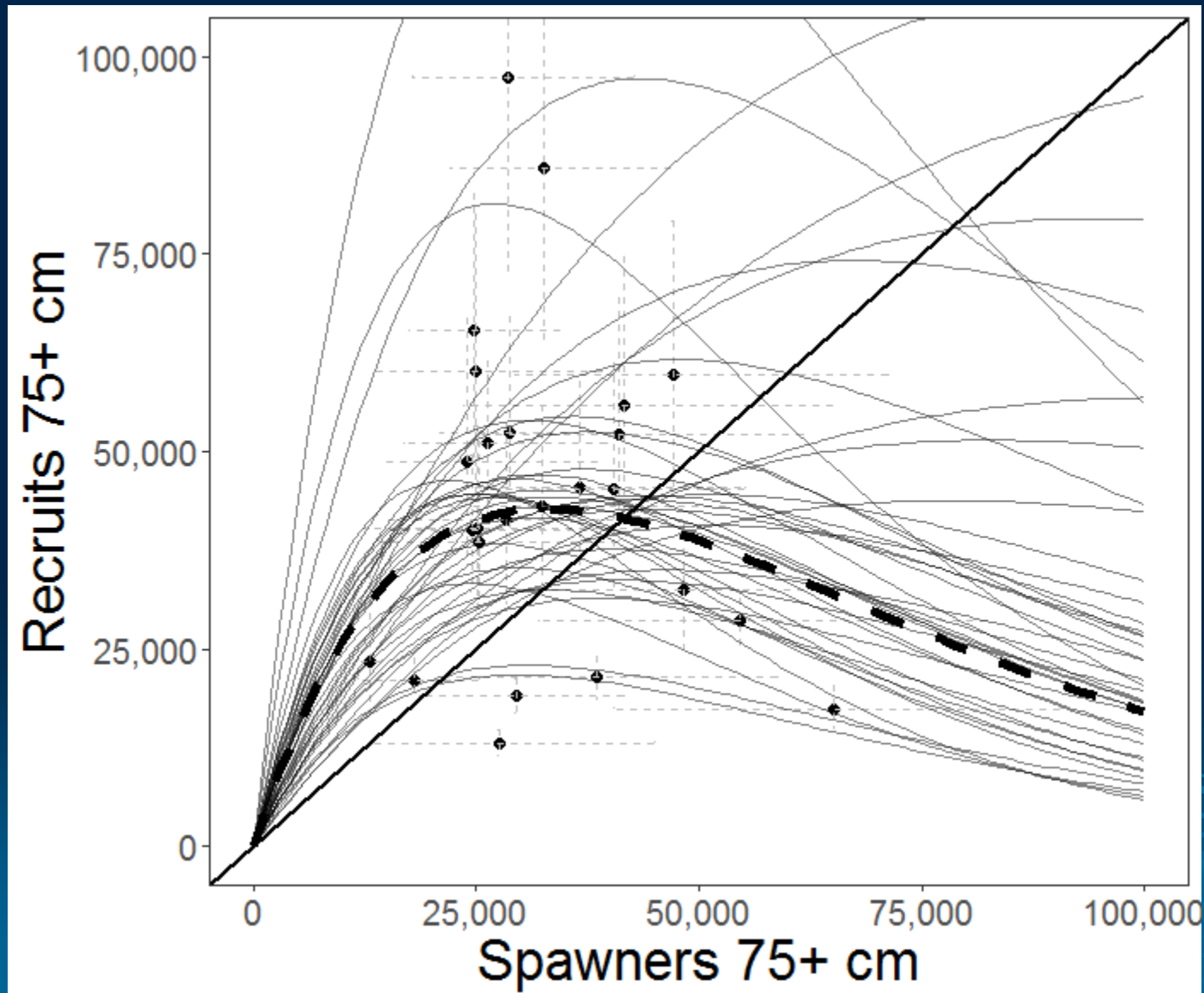
# Late Run Abundance (75+ cm)



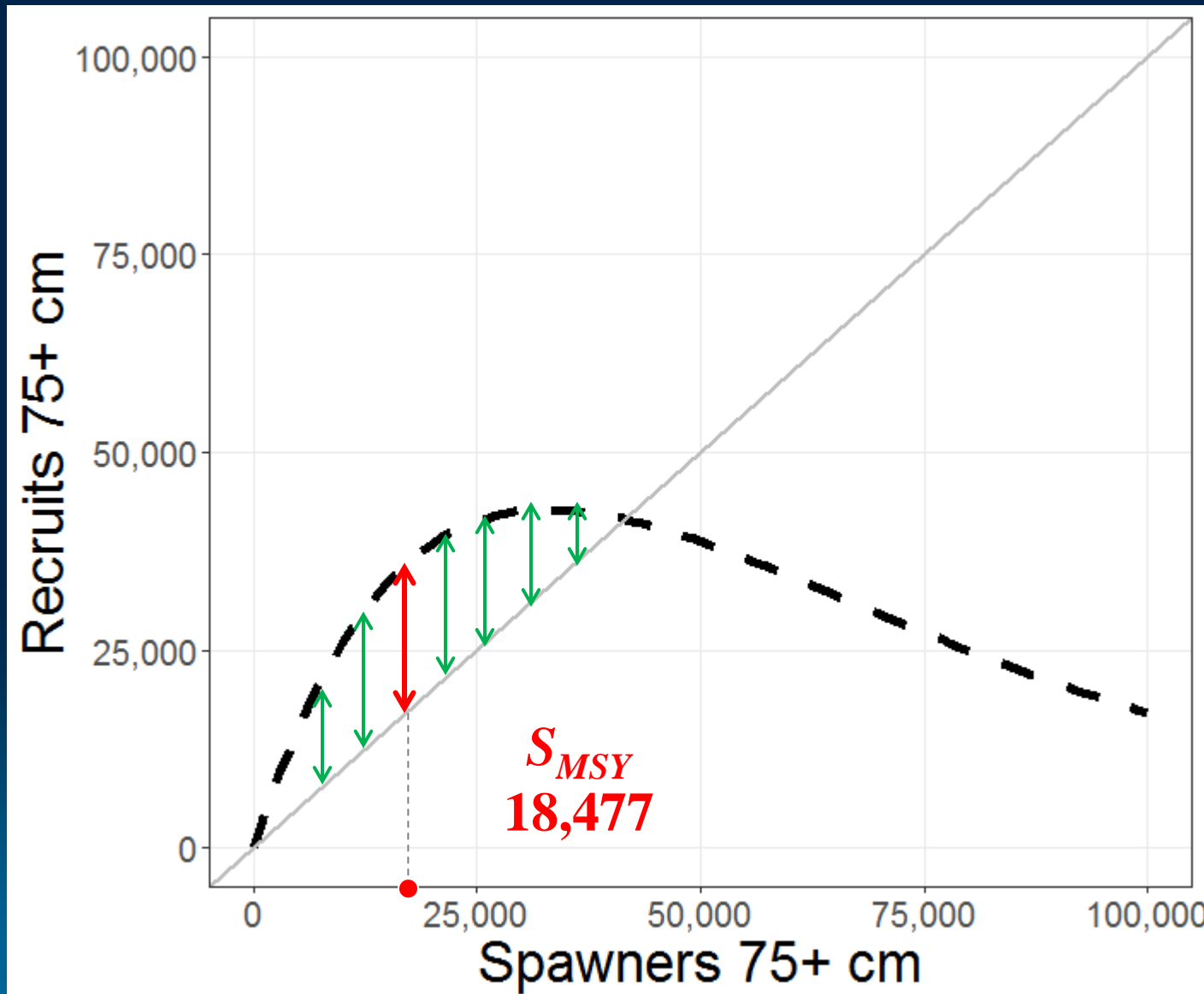
# LR Escapement, Recruitment (75+ cm)



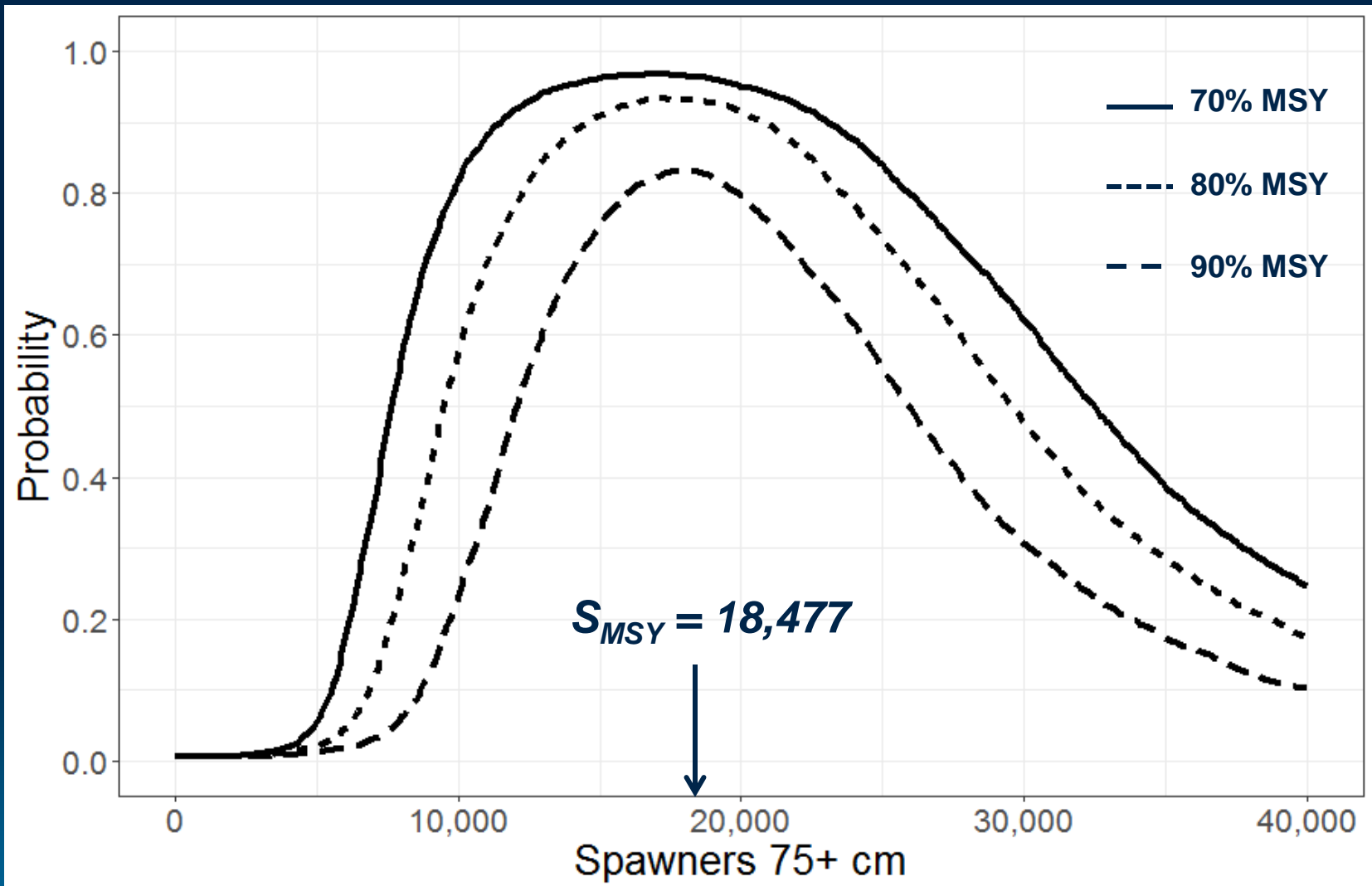
# LR Spawner-Recruit Analysis (75+ cm)



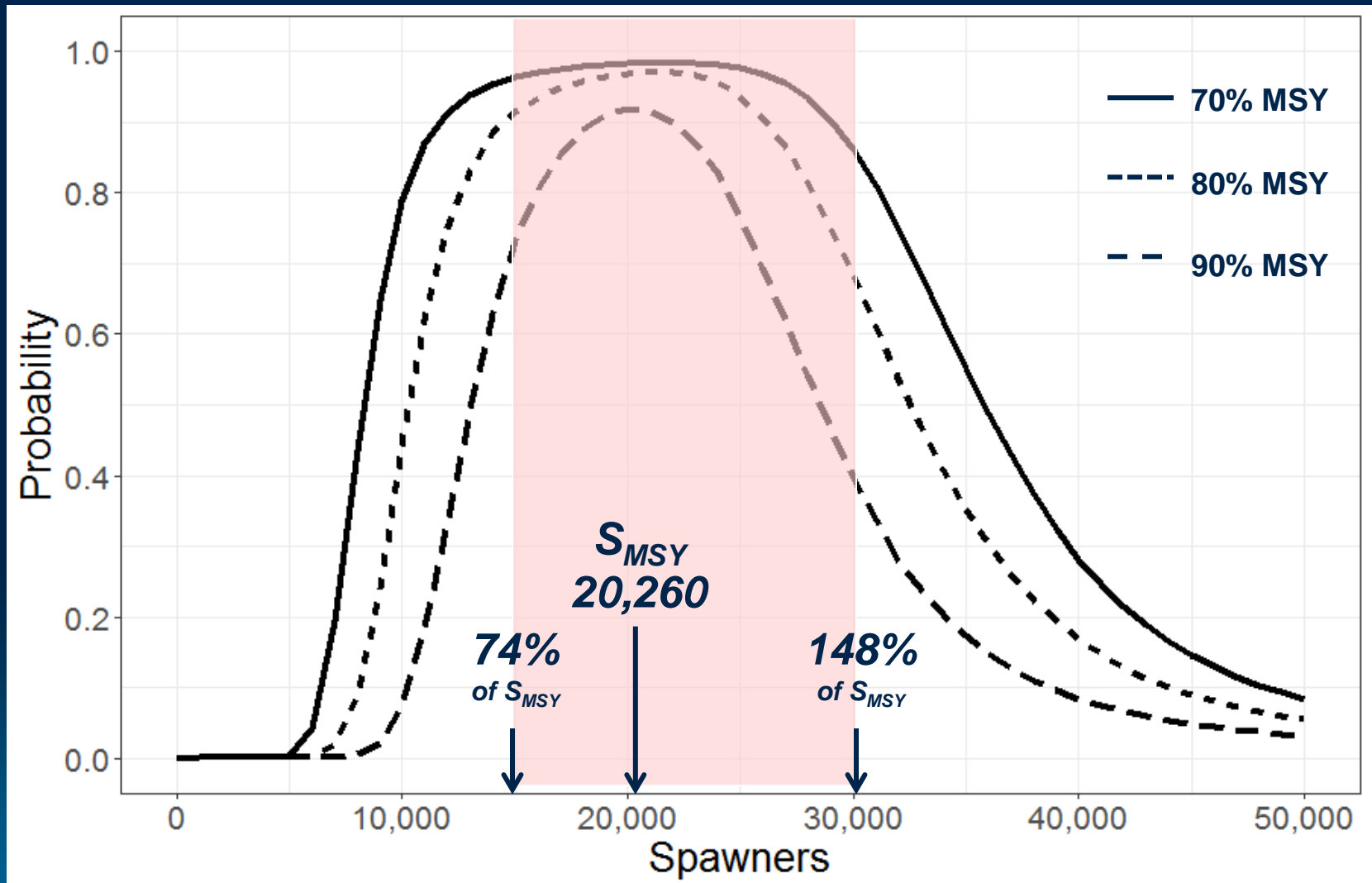
# LR Spawners providing MSY (75+ cm)



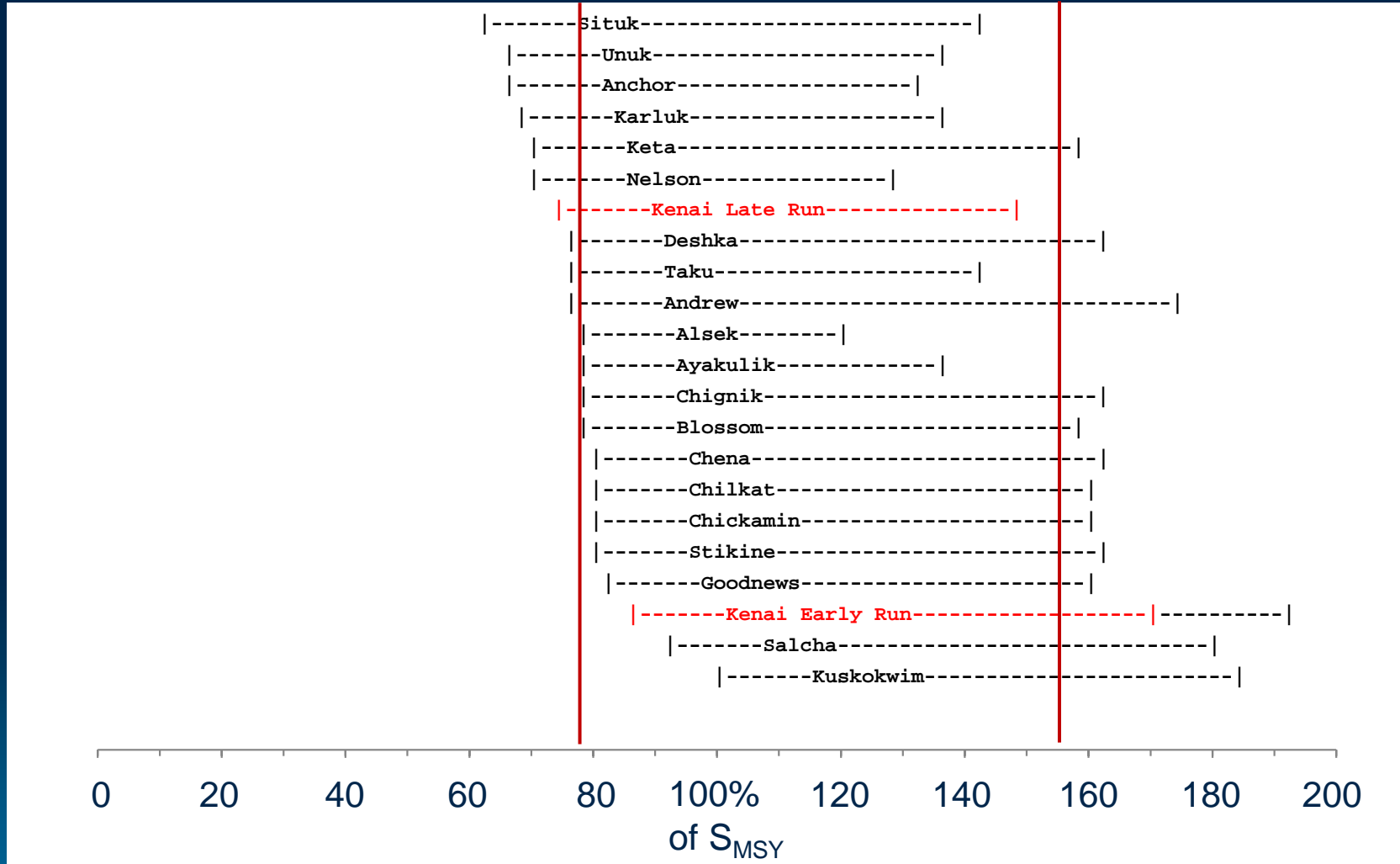
# LR Optimal Yield Profiles (75+ cm)



# 2013 Late Run OYPs (all sizes)



# Alaska King Salmon Goals





# Alaska King Salmon Goals

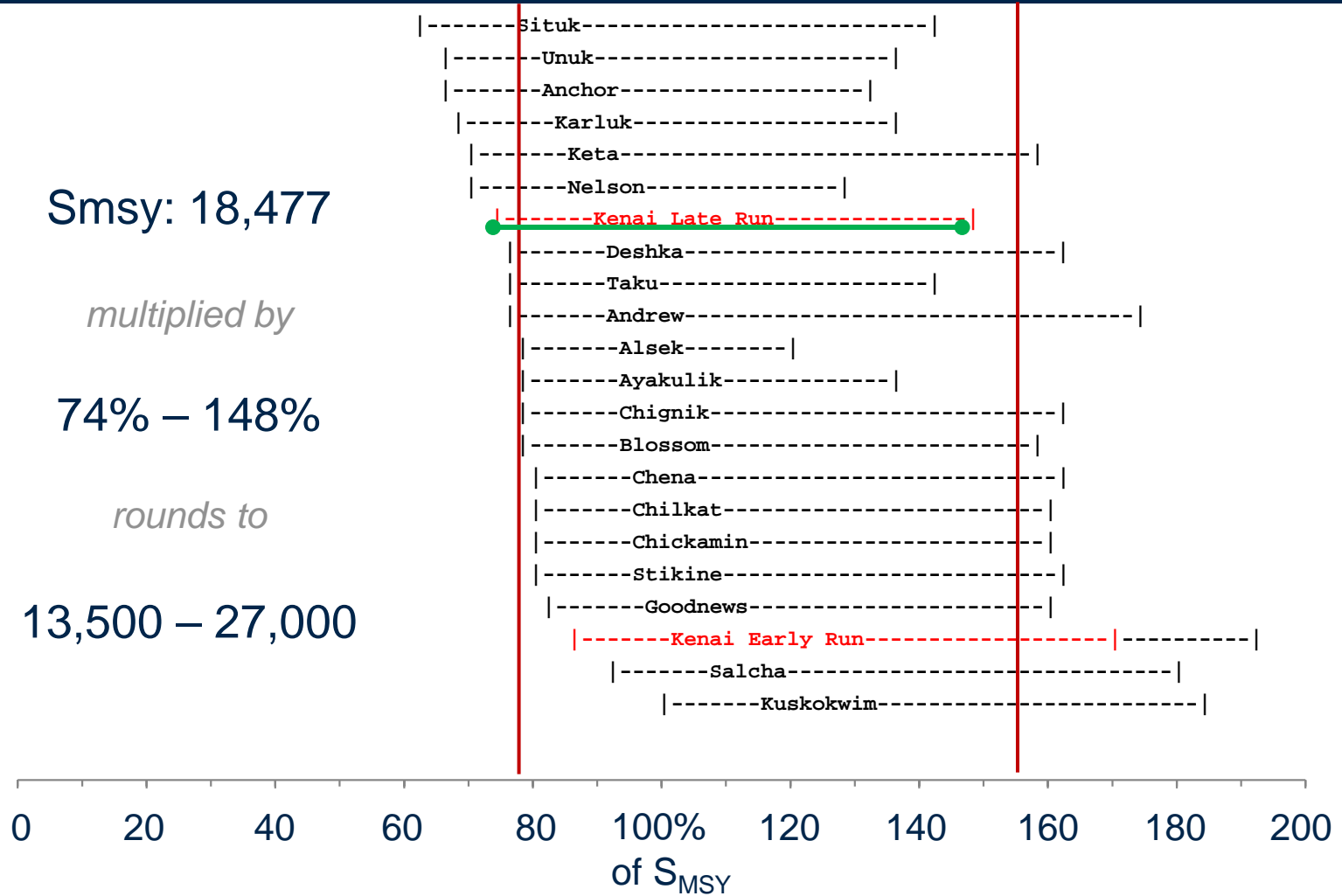
Smsy: 18,477

*multiplied by*

74% – 148%

*rounds to*

13,500 – 27,000

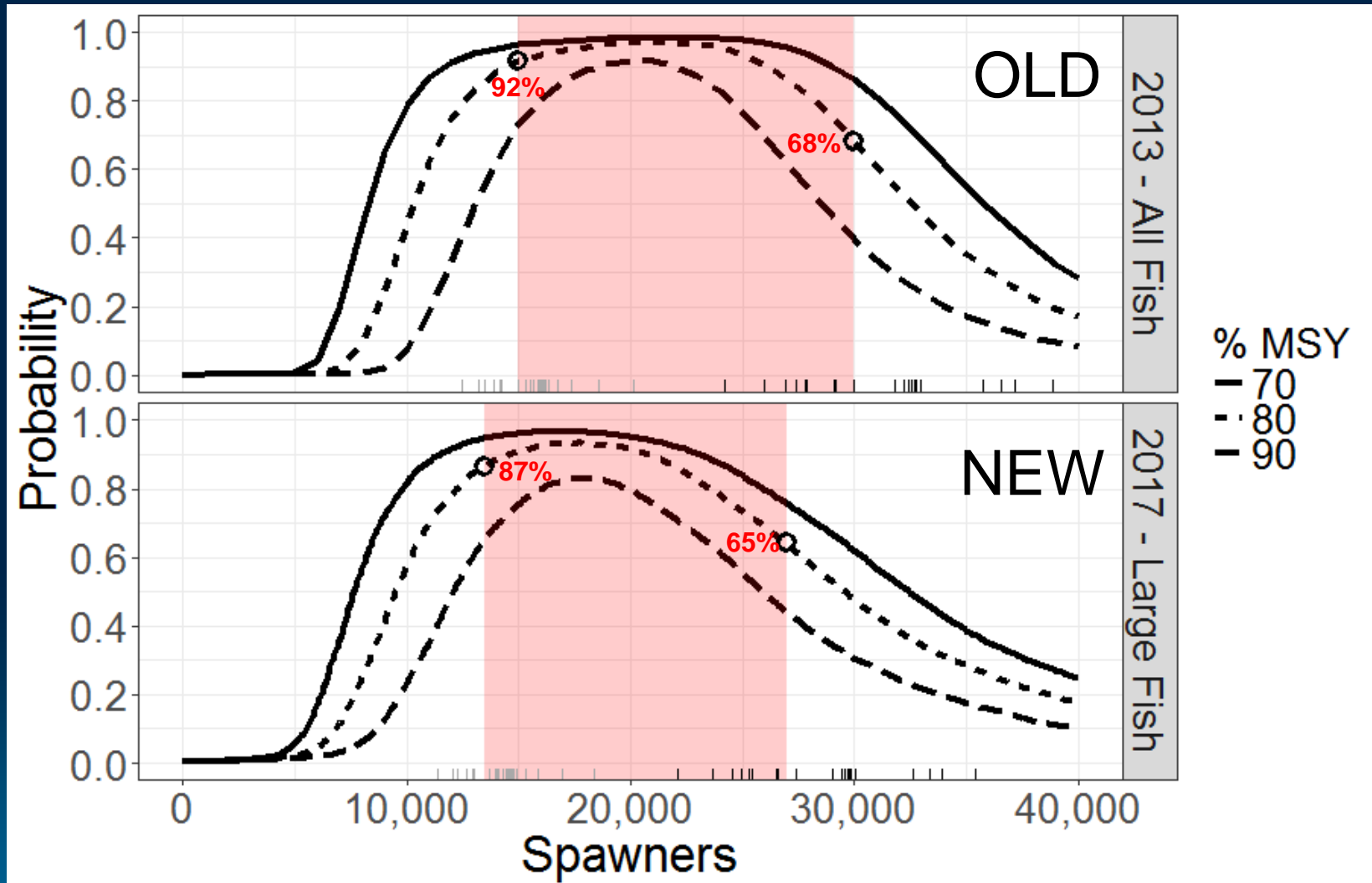


# Another Example

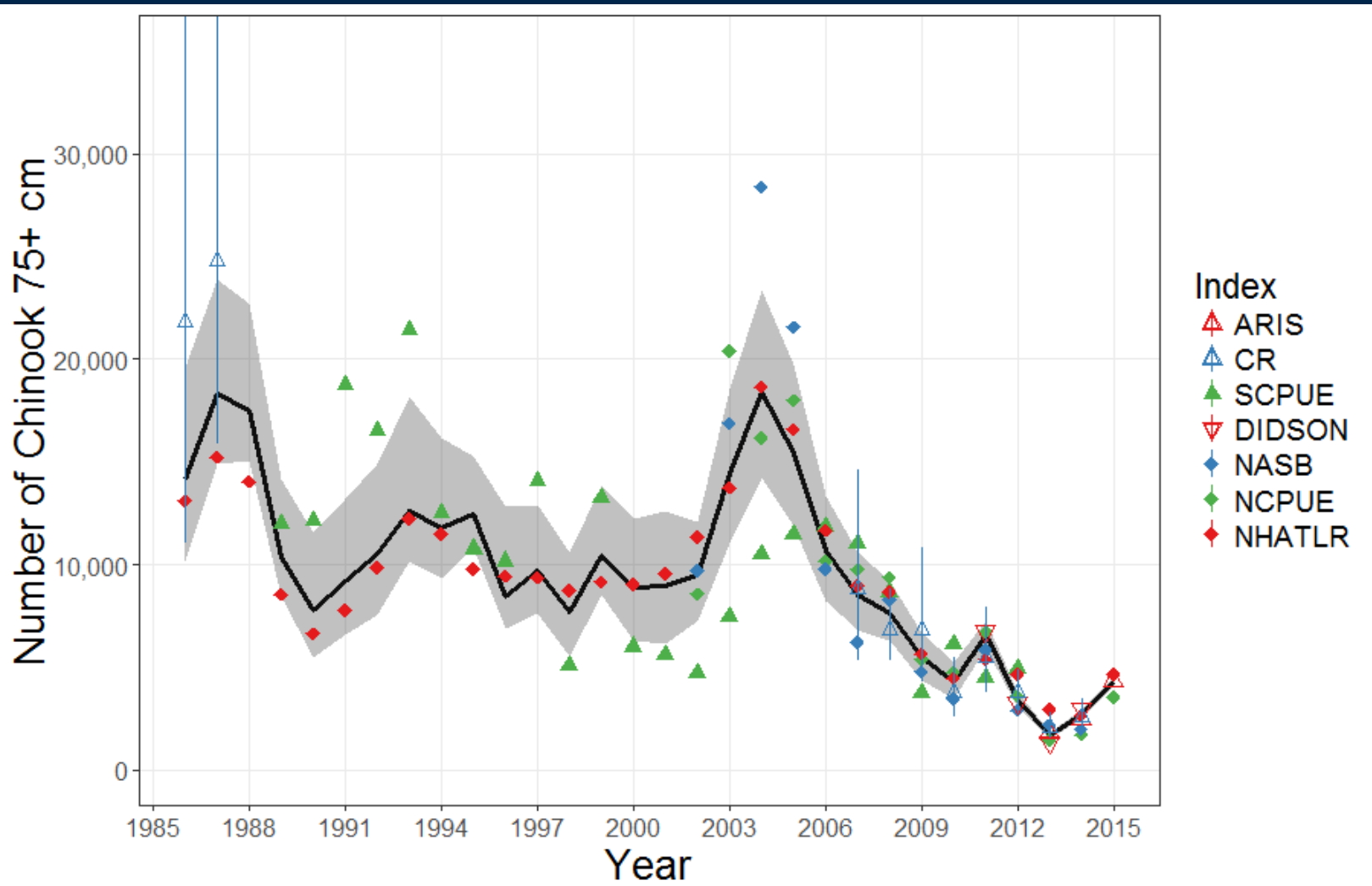
	Kenai Late Run	Ayakulik
Original Smsy	20,260	5,165
Original Goal	15,000 – 30,000	4,000 – 7,000
% of Smsy	<b>74% - 148%</b>	<b>77% - 136%</b>
What Changed?	More and better data, different currency	More data, improved analysis
New Smsy	18,477	6,213
New Goal	13,500 – 27,000	4,800 – 8,400

Original criteria applied to updated information

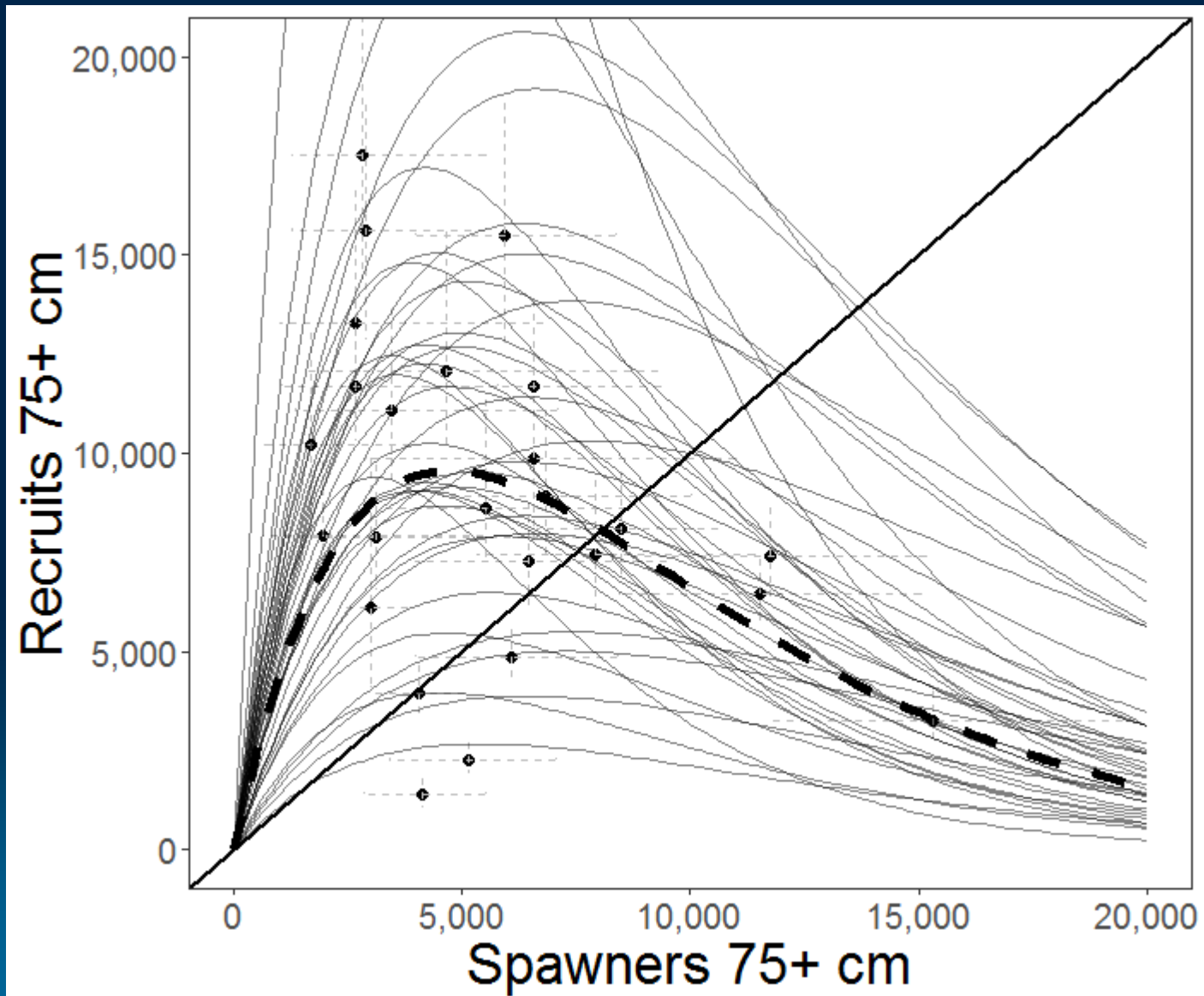
# 2013 Late Run Goal



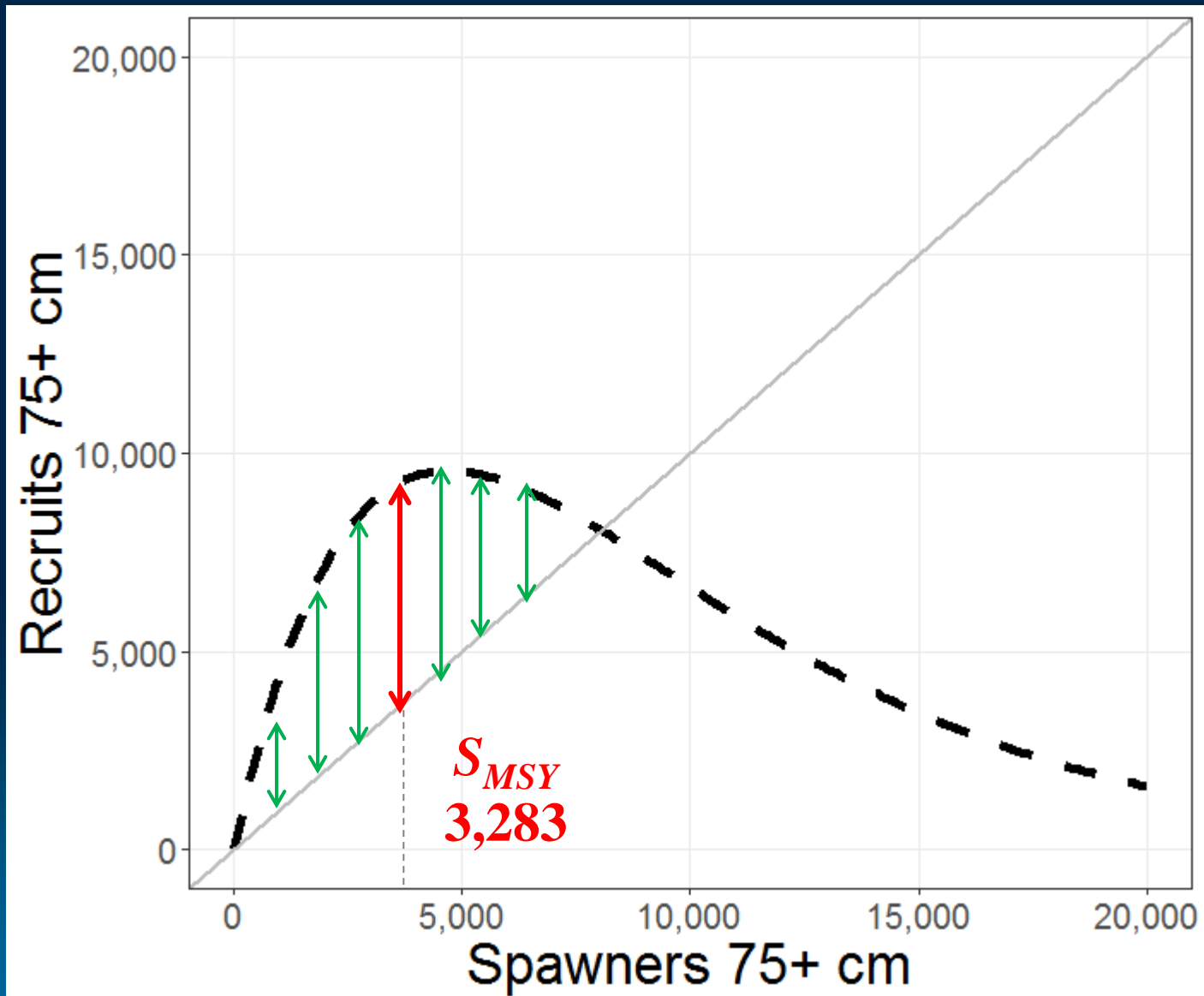
# Early Run Abundance (75+ cm)



# Early Run SRA (75+ cm)

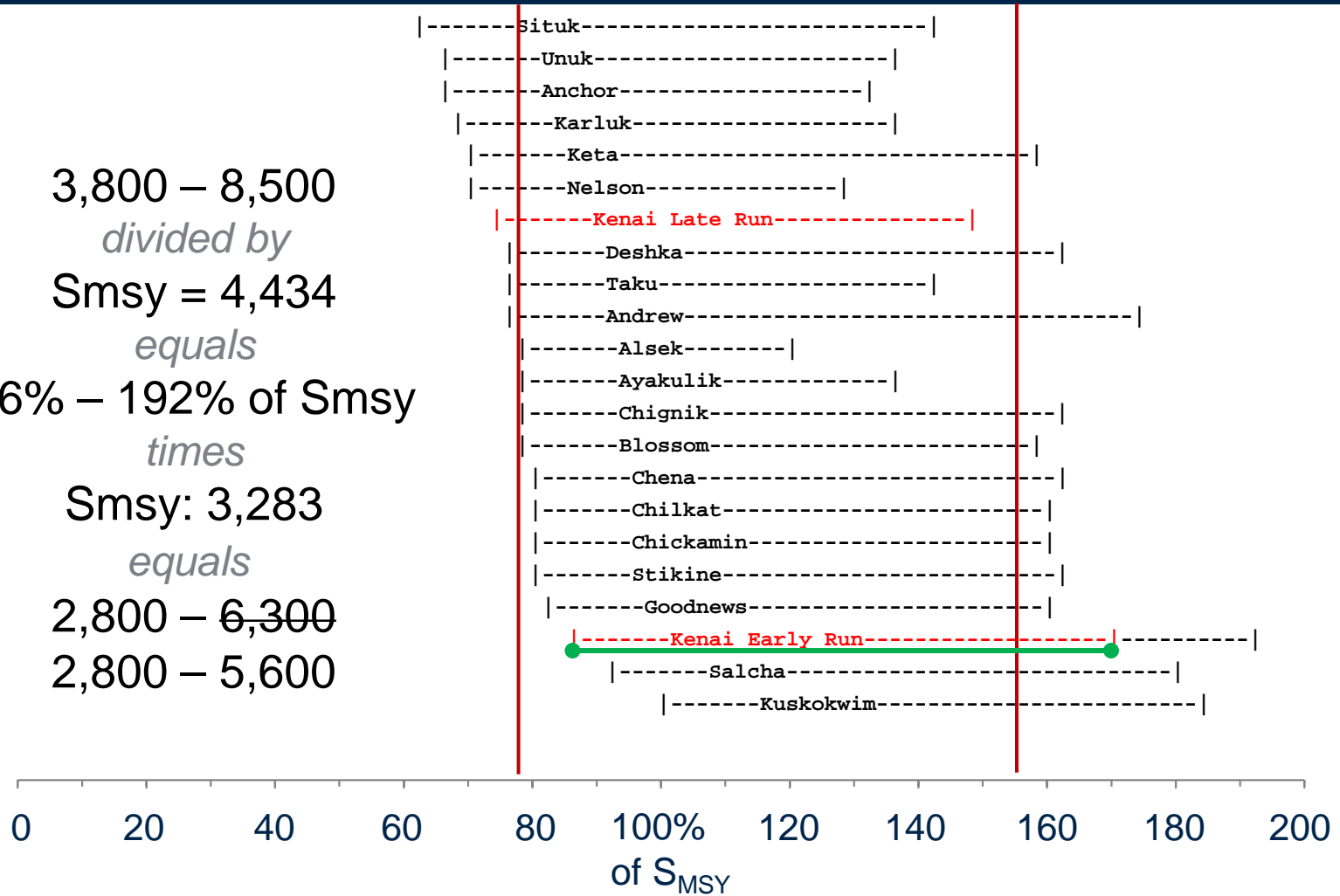


# Early Run $S_{MSY}$ (75+ cm)

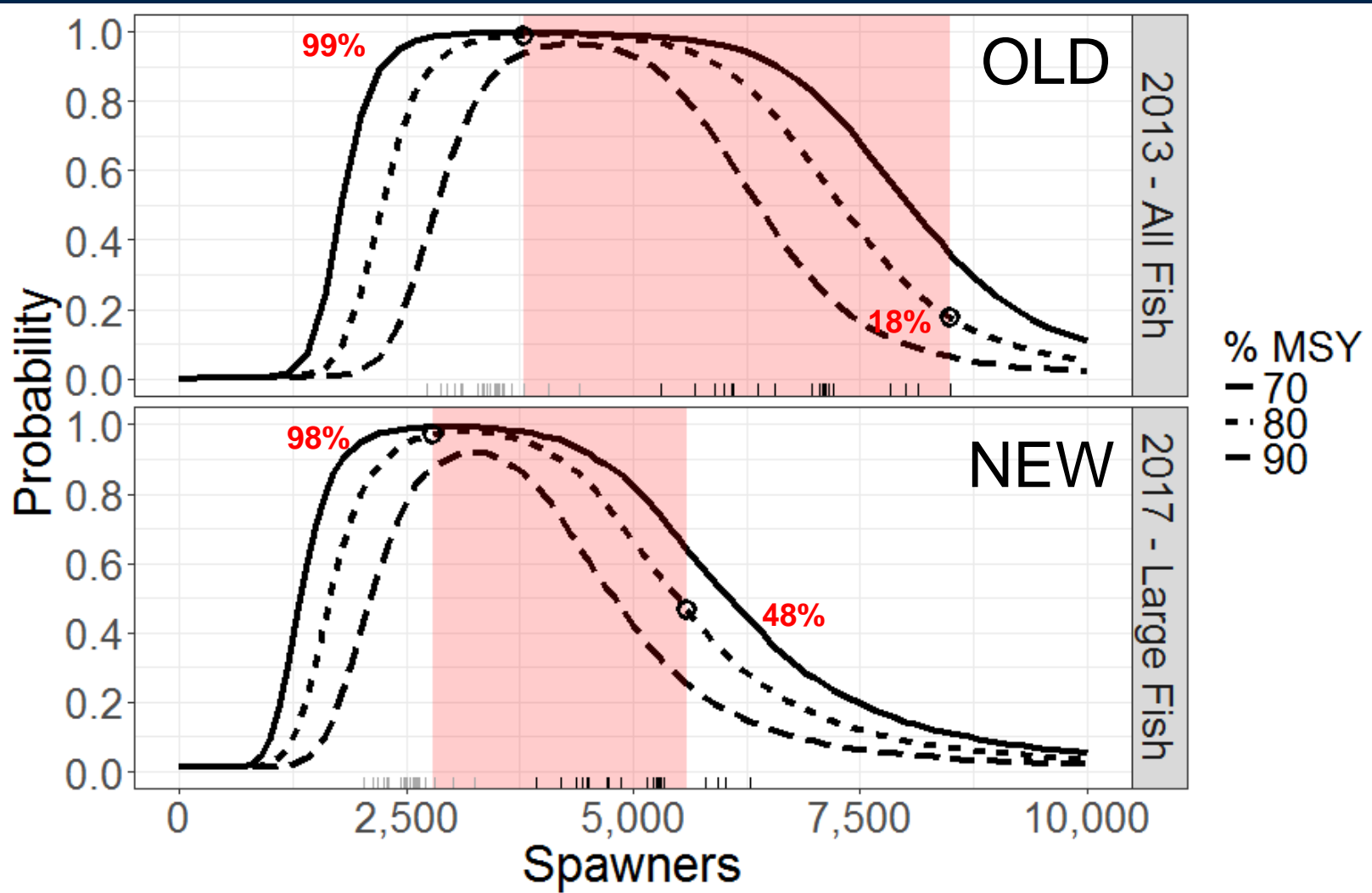


# Early Run Goal in Context

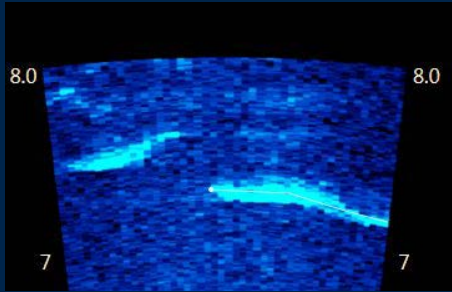
3,800 – 8,500  
*divided by*  
 Smsy = 4,434  
*equals*  
 86% – 192% of Smsy  
*times*  
 Smsy: 3,283  
*equals*  
 2,800 – 6,300  
 2,800 – 5,600



# Early Run OYPs







# Escapement Goals for Kenai River King Salmon 75 cm and Longer

- 1) Why size-based goals?
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# Effects on Management I

If future runs continue to be small in number and in size, fishing opportunities may be reduced compared to the *status quo*

- New LR goal is 90% of old goal
- 2014-2016 estimates of kings 75+ cm were only 61-77% of all-size king estimates

# Effects on Management II

Daily inseason estimates for kings 75+ cm

- Postseason estimates for kings of all sizes

Revisions to inseason estimates less likely

- Estimates based on sonar alone
- Methods more straightforward and settled

# Effects on Management III

Small fish will no longer have the potential to influence management

Less risk of putting very few females on the spawning beds

# Acknowledgements

## Researchers:

Adam Reimer – DSF Biometrician

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Pat Shields – DCF Management Biologist

Matt Miller – DSF Management Coordinator

Tim Baker – DCF Management Coordinator