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# Evaluation of Juvenile Salmonid Passage and Behavior at Foster Dam Utilizing Radio Telemetry, 2015 and 2016

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**Presenter Information**

James Hughes, Stephanie Liss, Ryan Flaherty, Eric Fischer, Brian Bellgraph, Gary Johnson, and Fenton Khan



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# Evaluation of Juvenile Salmonid Passage and Behavior at Foster Dam Utilizing Radio Telemetry, 2015 and 2016

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Fish Passage 2017  
Oregon State University, Corvallis, OR  
June 19 – 21, 2017

# Presentation Outline

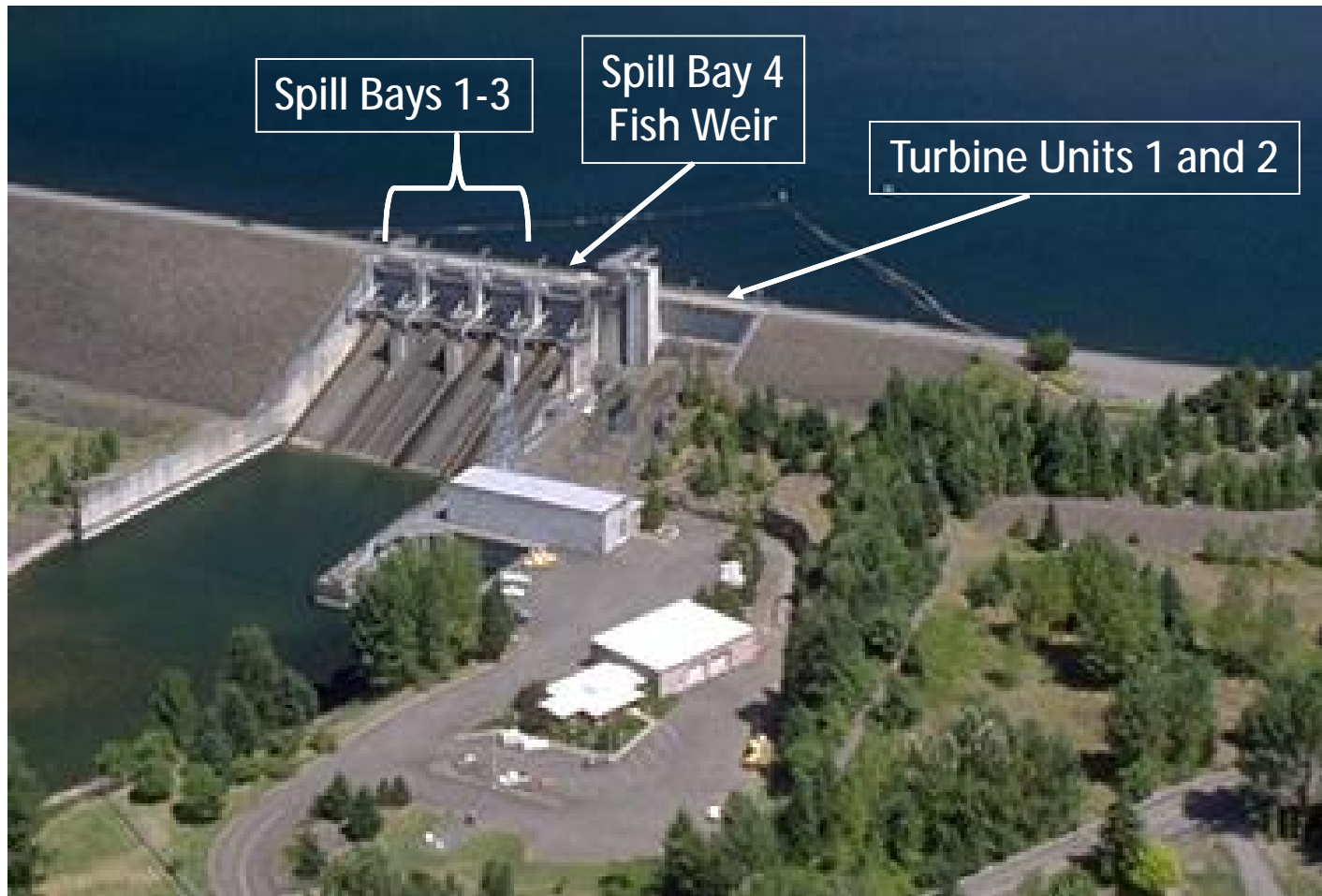
- ▶ Study Area
- ▶ Methods
- ▶ Objectives
- ▶ Results
- ▶ Summary and Next Steps



# Study Area



# Foster Dam



# Foster Dam



# Project Objectives

- ▶ Perform a full project assessment at two reservoir elevations for passage and survival of radio-tagged juvenile Chinook salmon and steelhead
  - Estimate
    - Passage distribution
    - Route-specific and dam passage survival





- ▶ Fish Source – Oregon State University Wild Fish Surrogate Program
  - Tagged and released in 2015 and 2016
    - Yearling Chinook salmon – 750
    - Age-2 steelhead – 800
    - Subyearling Chinook salmon – 1,350
- ▶ Tags
  - LOTEK Nano radio tag; model NTC-M-2
  - Passive Integrated Transponder (PIT)
- ▶ Radio Telemetry Detection Arrays
  - Underwater and aerial antennas
    - Foster Dam – individual routes
    - Foster tailwaters
  - Autonomous Orion receivers (Sigma Eight Inc.)
  - Multiprotocol Integrated Telemetry Acquisition System (MITAS)



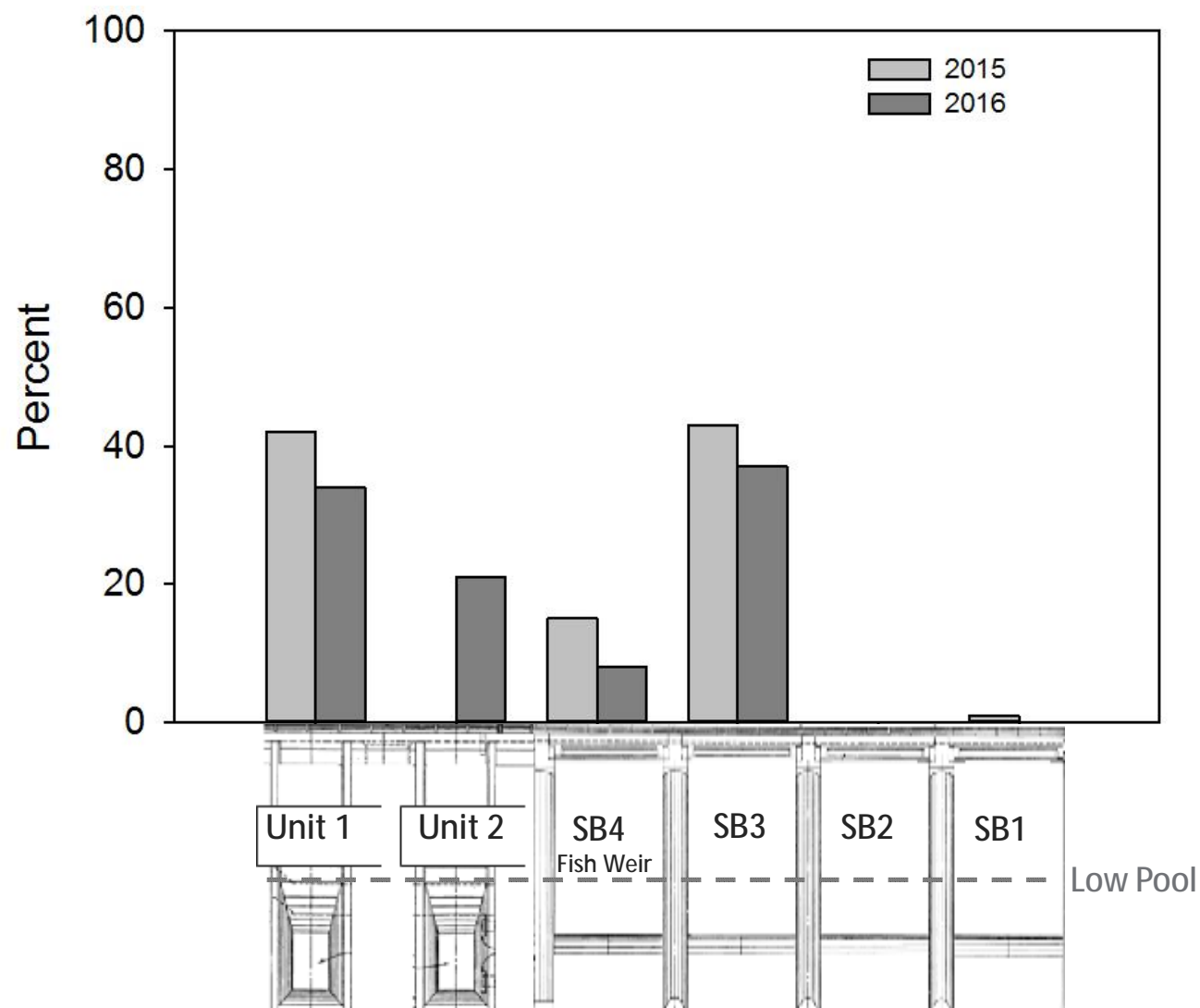


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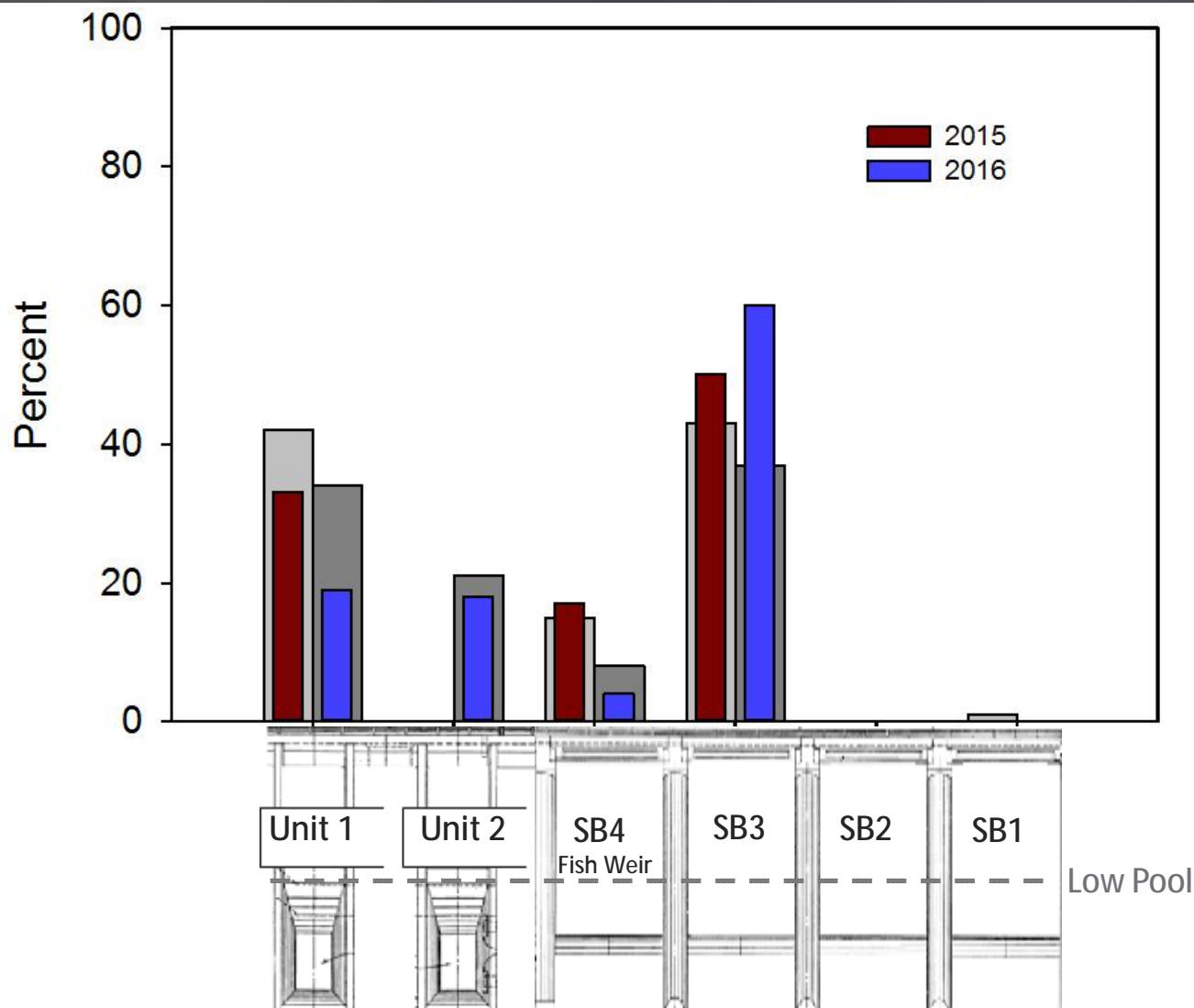
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# Results

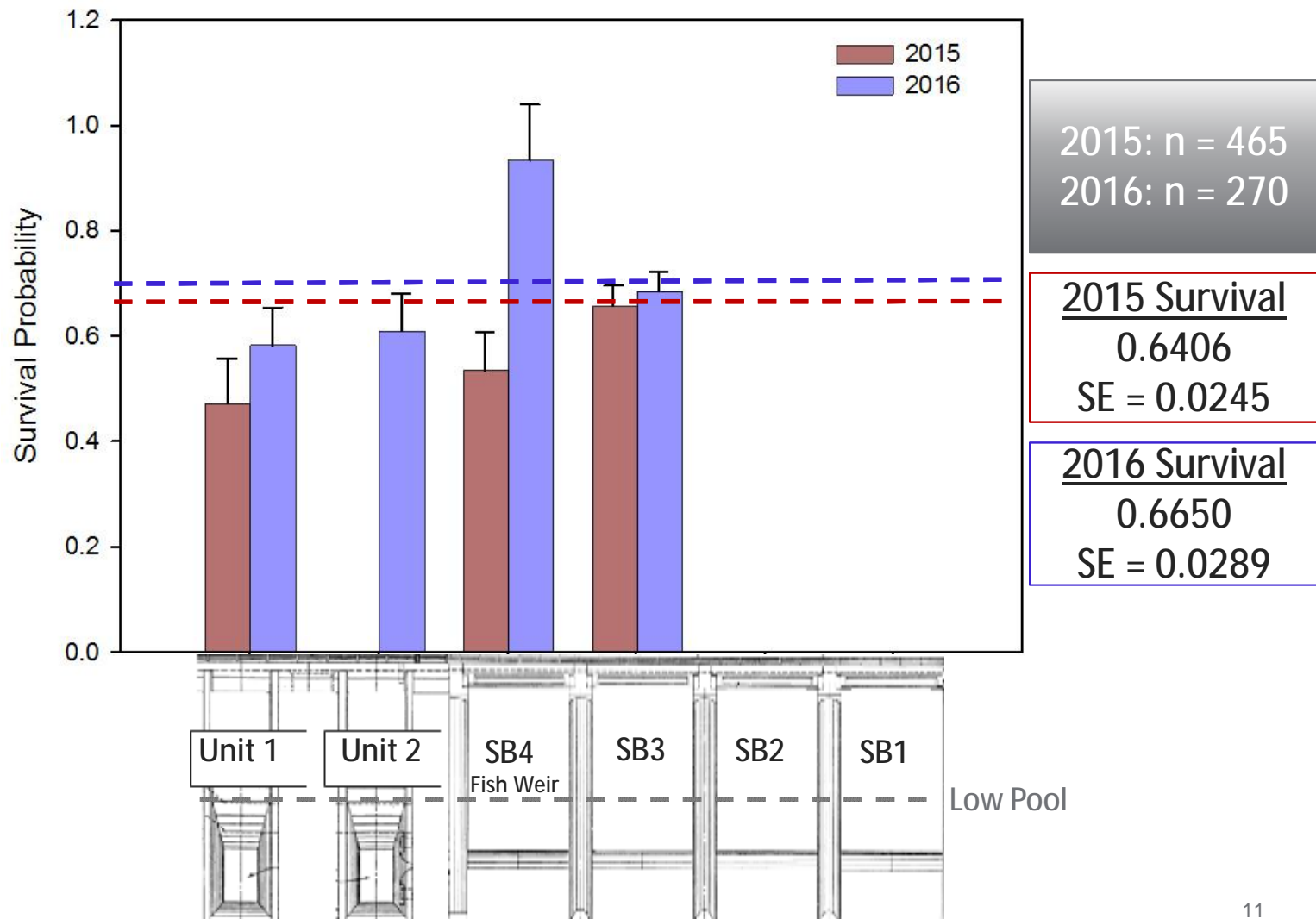
# Discharge Spring – Low Pool; Yearling Chinook Salmon



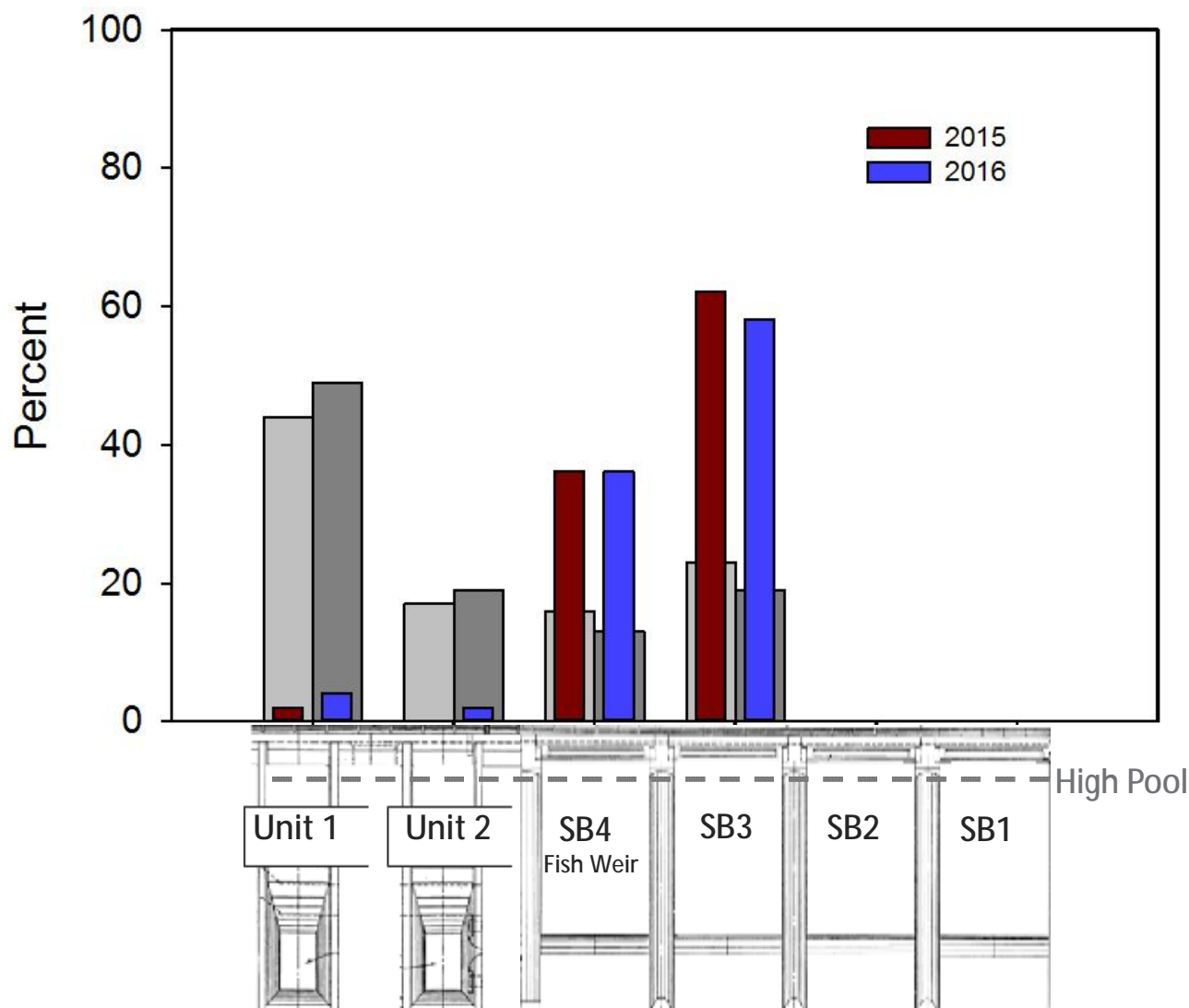
# Passage Distributions Spring – Low Pool; Yearling Chinook Salmon



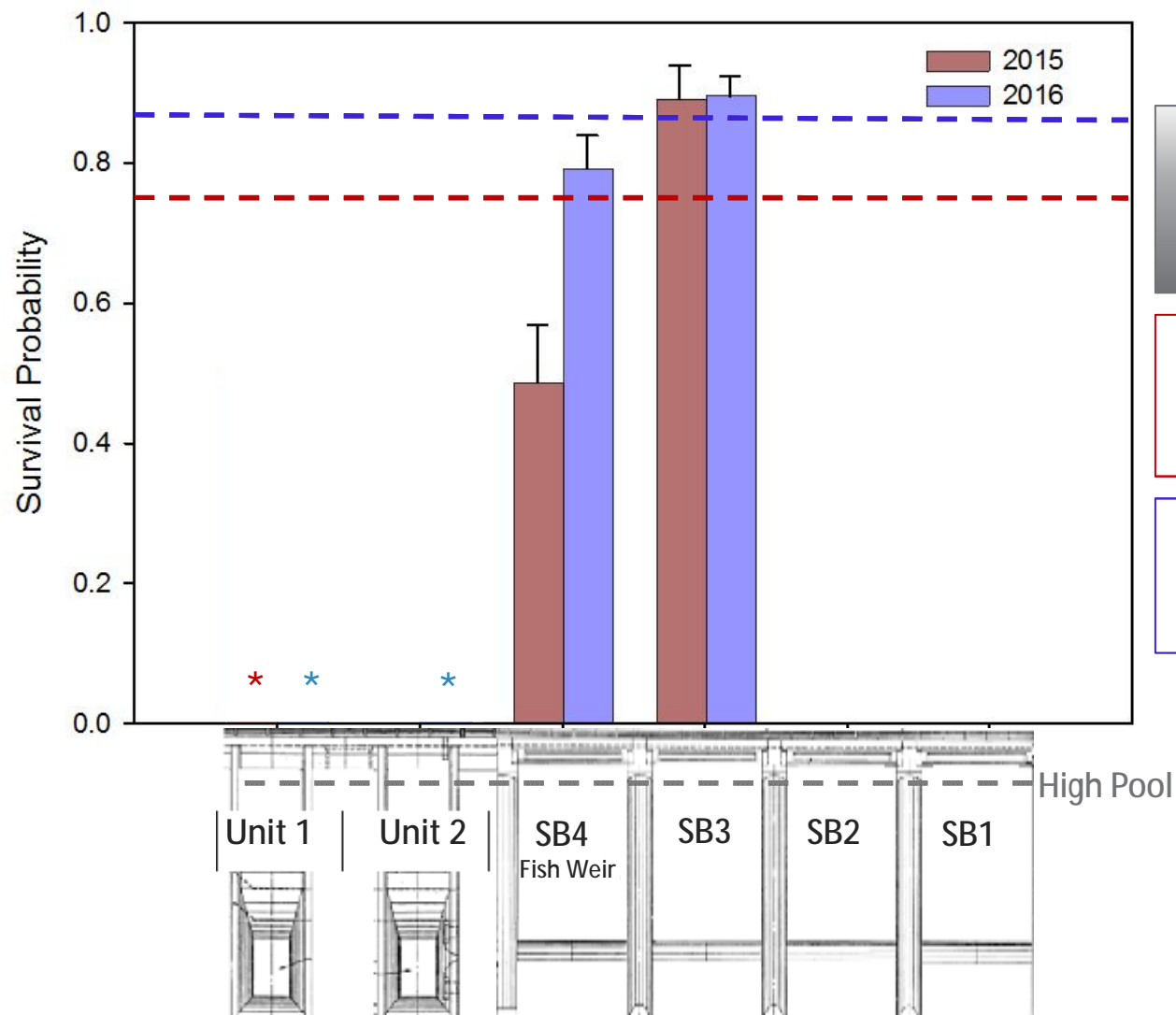
# Survival Spring – Low Pool; Yearling Chinook Salmon



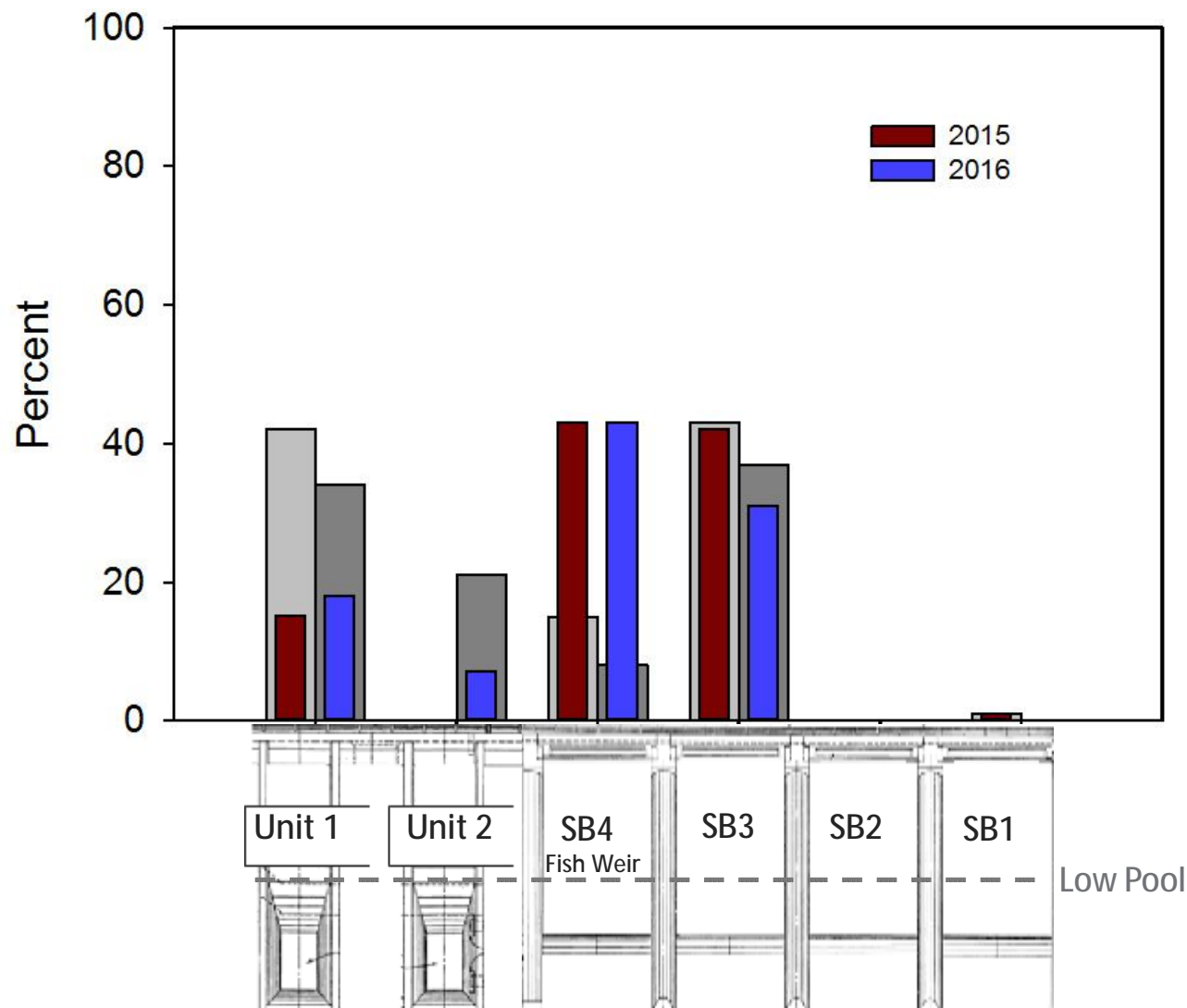
# Passage Distributions Spring – High Pool; Yearling Chinook Salmon



# Survival Spring – High Pool; Yearling Chinook Salmon

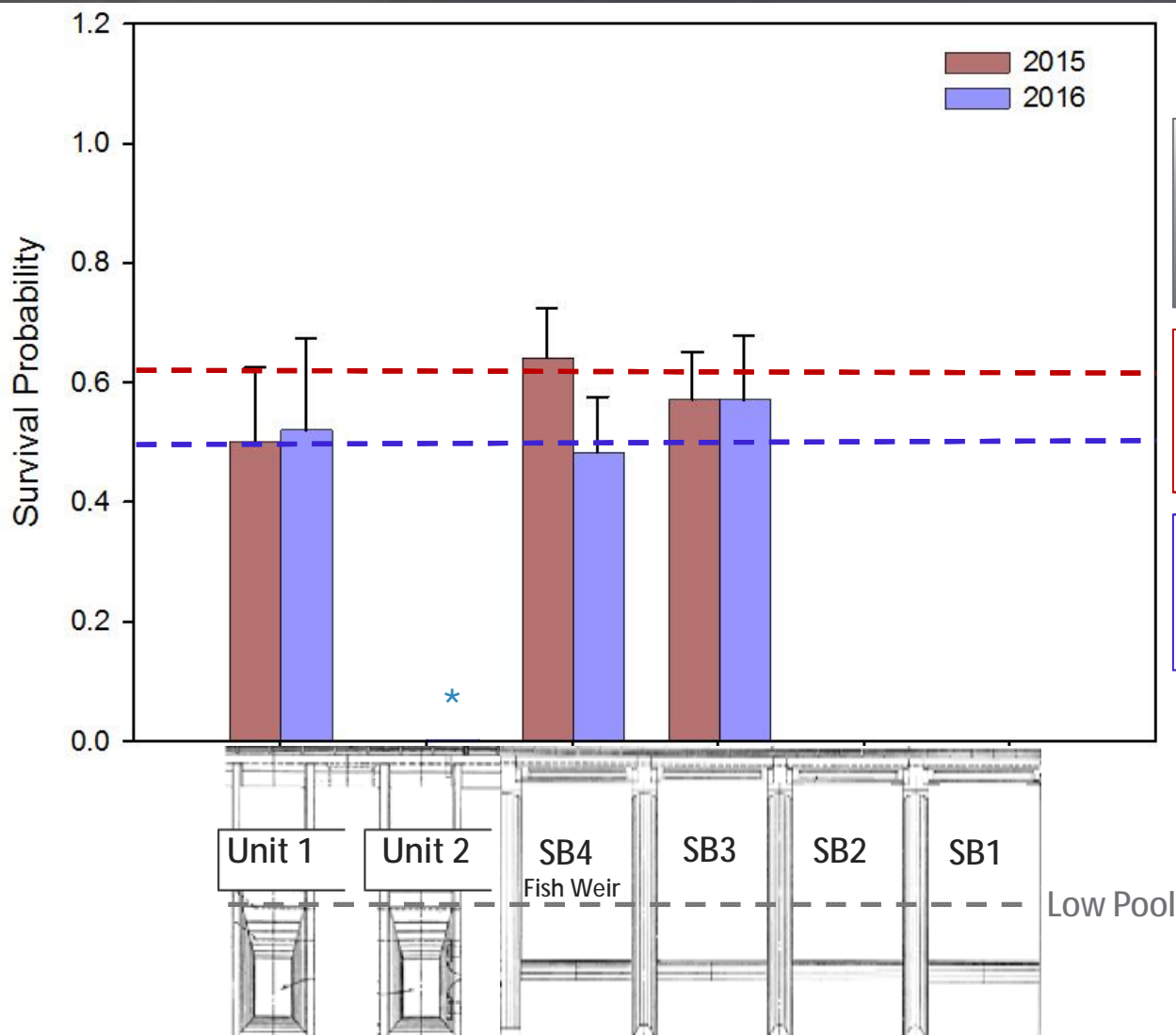


# Passage Distributions Spring – Low Pool; Steelhead (Age-2)





# Survival Spring – Low Pool; Steelhead (Age-2)

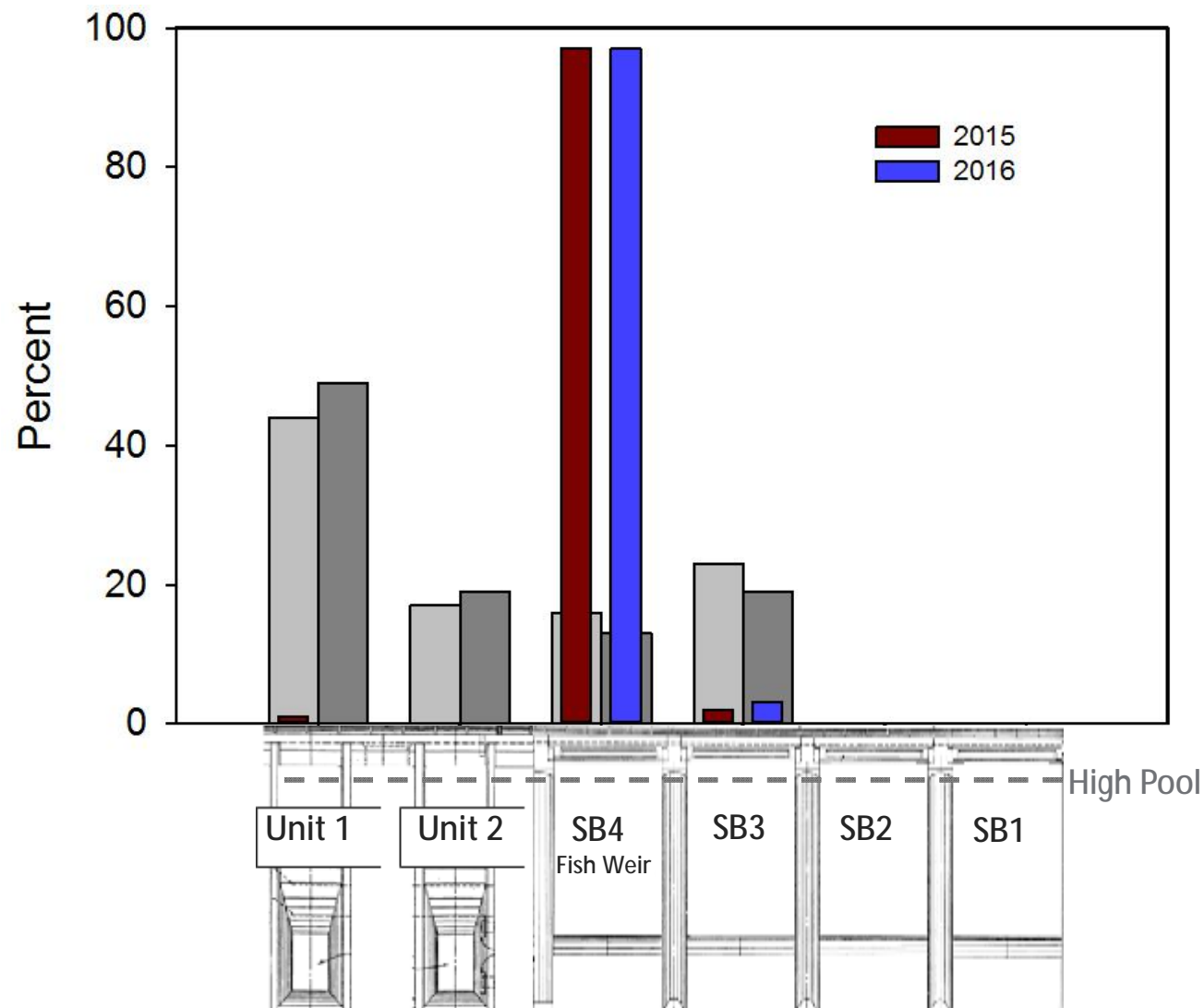


2015: n = 112  
2016: n = 75

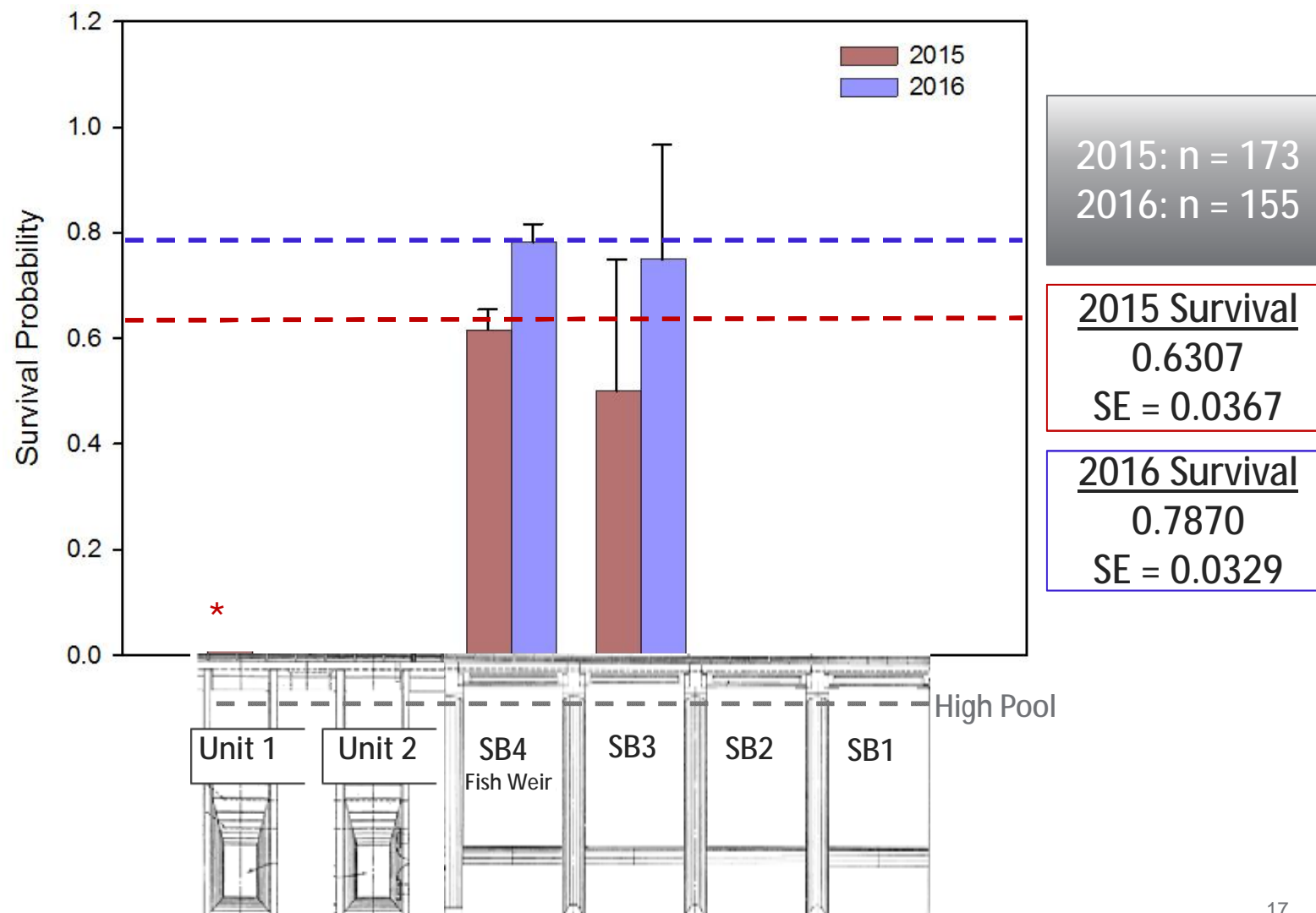
2015 Survival  
0.6310  
SE = 0.0477

2016 Survival  
0.5020  
SE = 0.0591

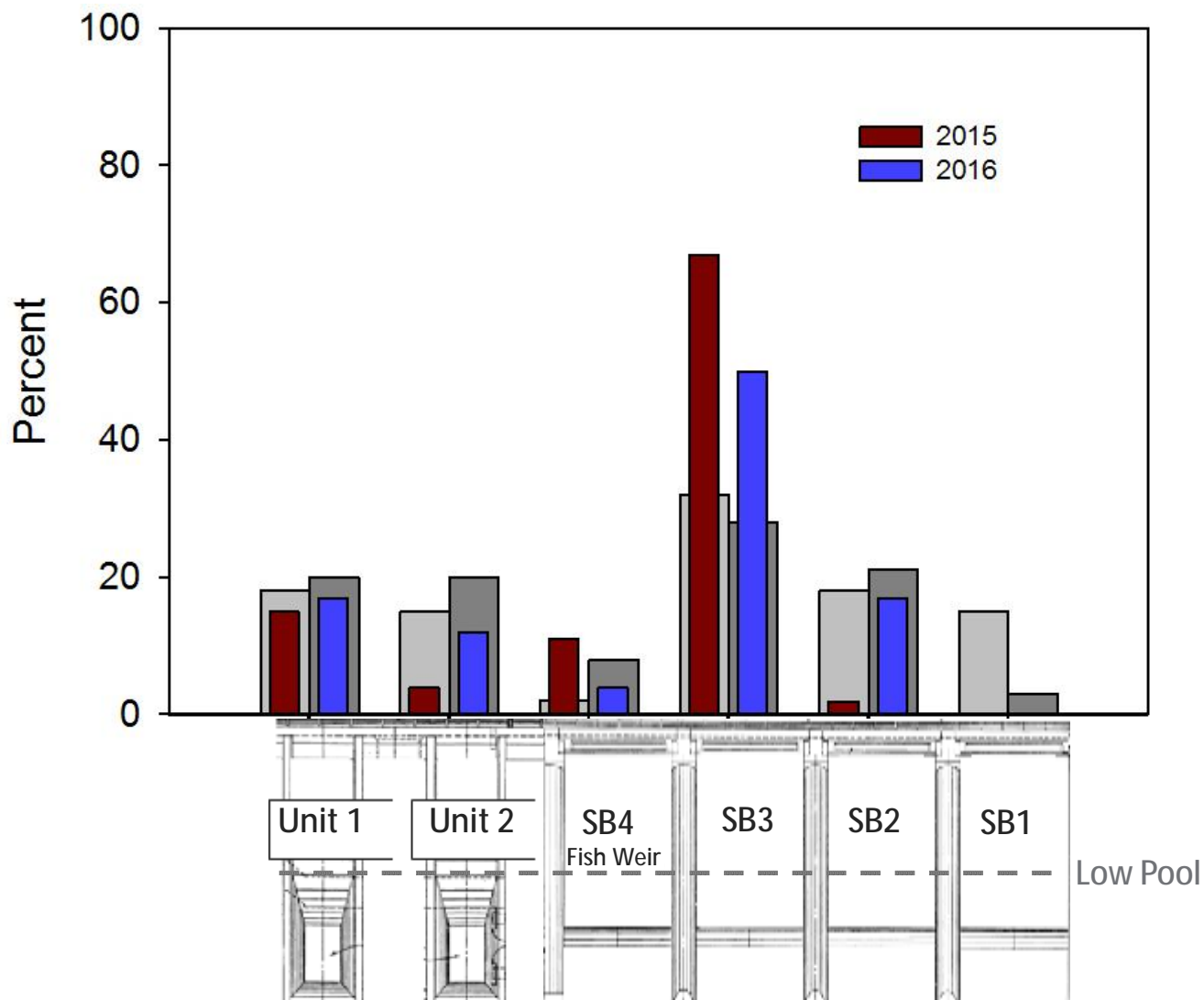
# Passage Distributions Spring – High Pool; Steelhead (Age-2)



# Survival Spring – High Pool; Steelhead (Age-2)

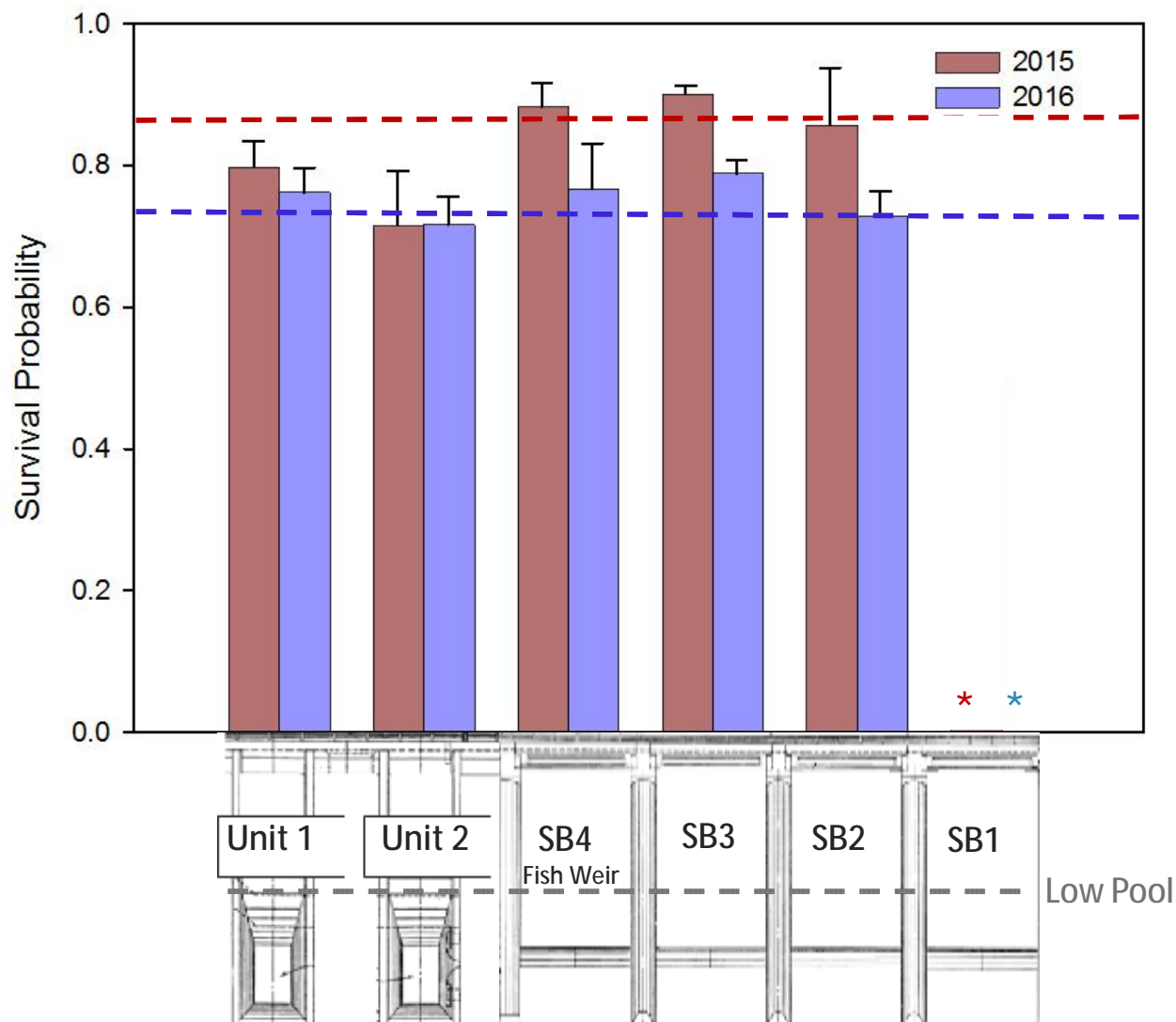


# Passage Distributions Fall – Low Pool; Subyearling Chinook Salmon



# Survival

## Fall – Low Pool; Subyearling Chinook Salmon



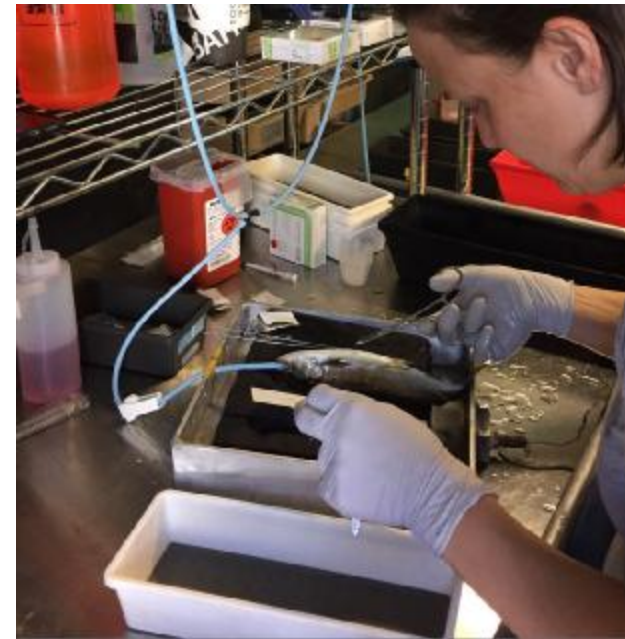
2015: n = 871  
2016: n = 1014

2015 Survival  
0.8760  
SE = 0.0112

2016 Survival  
0.7603  
SE = 0.0130

# Summary and Next Steps

- ▶ Preferred route of passage
  - Yearling Chinook salmon – Spillway (SB3)
  - Steelhead (Age-2) – Fish Weir (SB4)
  - Subyearling Chinook salmon – Spillway (SB3)
  
- ▶ New fish weir completed spring 2018
  - New fish weir discharge of 300-860 cfs
  - Normal discharge of 530 cfs
  - Old fish weir discharge was 250 cfs
  
- ▶ Post-construction evaluation in 2018



# Acknowledgments

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# Questions?