

Preliminary analyses of
pre-TRP vs. post-TRP observer data
(Deep-set longline fishery, 2001-2014)

Presented by

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False Killer Whale Take Reduction Team Meeting
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Objectives

1. **Summaries of observer data:**
 - a. Fishing effort by EEZ, 2001-2014
 - b. False killer whale and 'blackfish' takes

2. **Comparison of Pre-TRP and post-TRP periods**
 - a. Mortality and serious injury rates
 - b. Proportion of non-serious injuries

3. **Estimate how long it would take to detect changes in...**
 - a. Total false killer whale & blackfish take rates
 - b. Proportion of non-serious injuries

Deep-set Fishery Observer Data Preliminary Analyses 2001-2014

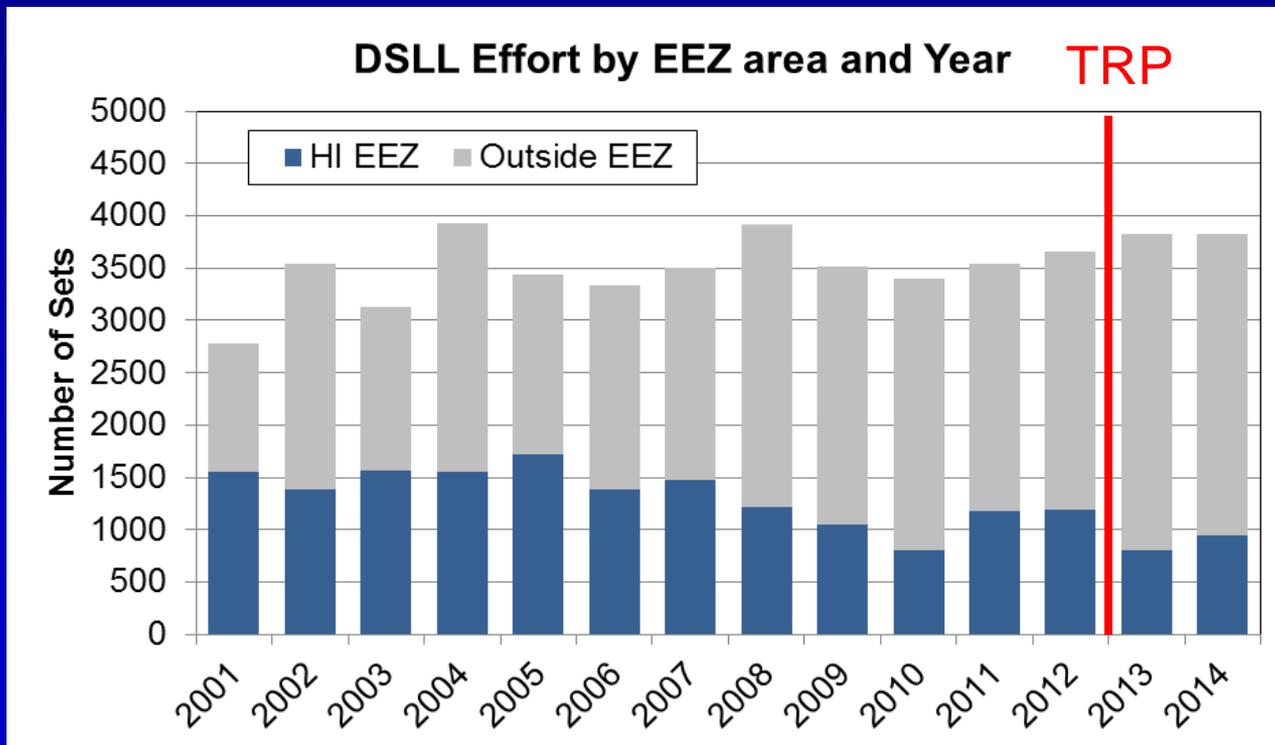
Data Inclusion/Exclusion Criteria:

- 2001-2004 'Tuna' trips (n=935)
- 2004-2014 'deep-set' trips (n=2851)
- Excluded trips flagged as *INVALID* (n=14)
- Excluded *research* trips (n=119)
- For 2014:
 - 130 *APPROVED* trips
 - 144 *not yet APPROVED* trips

Deep-set Fishery Observer Data Preliminary Analyses 2001-2014

	Pre-TRP	Post-TRP
Data years	2001-2012	2013-2014
No. sets	41,680	7,661

Summary of
observed
fishing effort



Average
number of
sets per year:

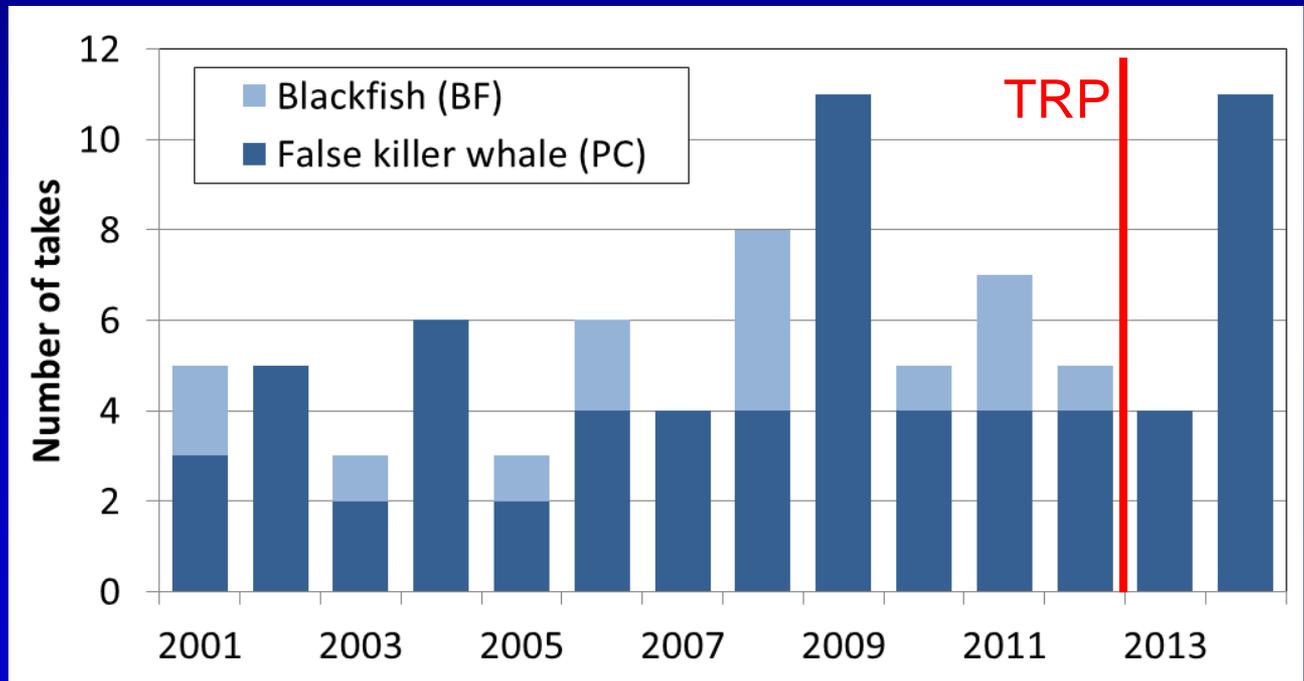
3,524

Deep-set Fishery Observer Data Preliminary Analyses 2001-2014

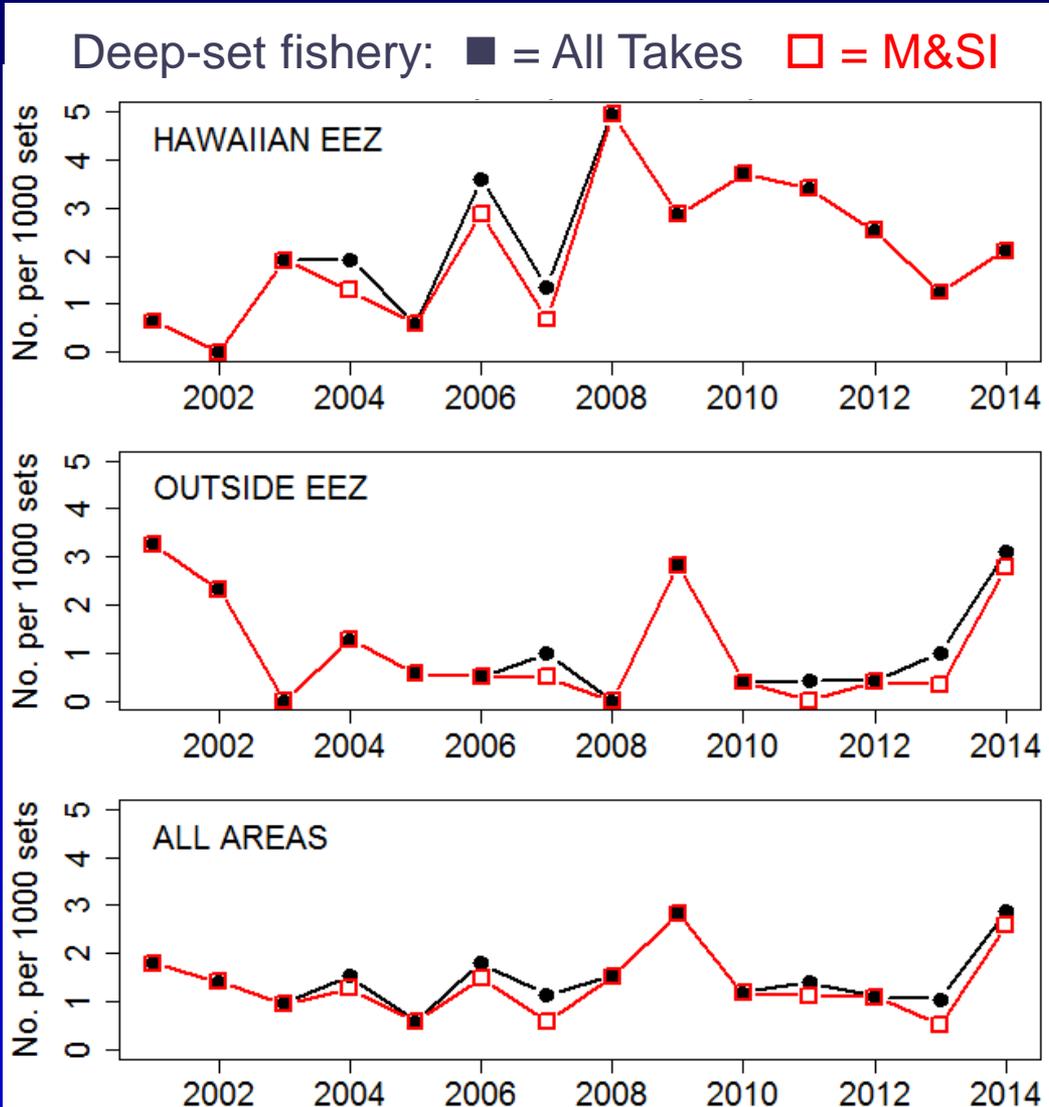
Summary of
observed takes
and mortality &
serious injuries
(M&SI)

Analyses
combine all
false killer
whale and
'blackfish'
takes

	Pre-TRP	Post-TRP
All takes	60	15
M&SI	55	11



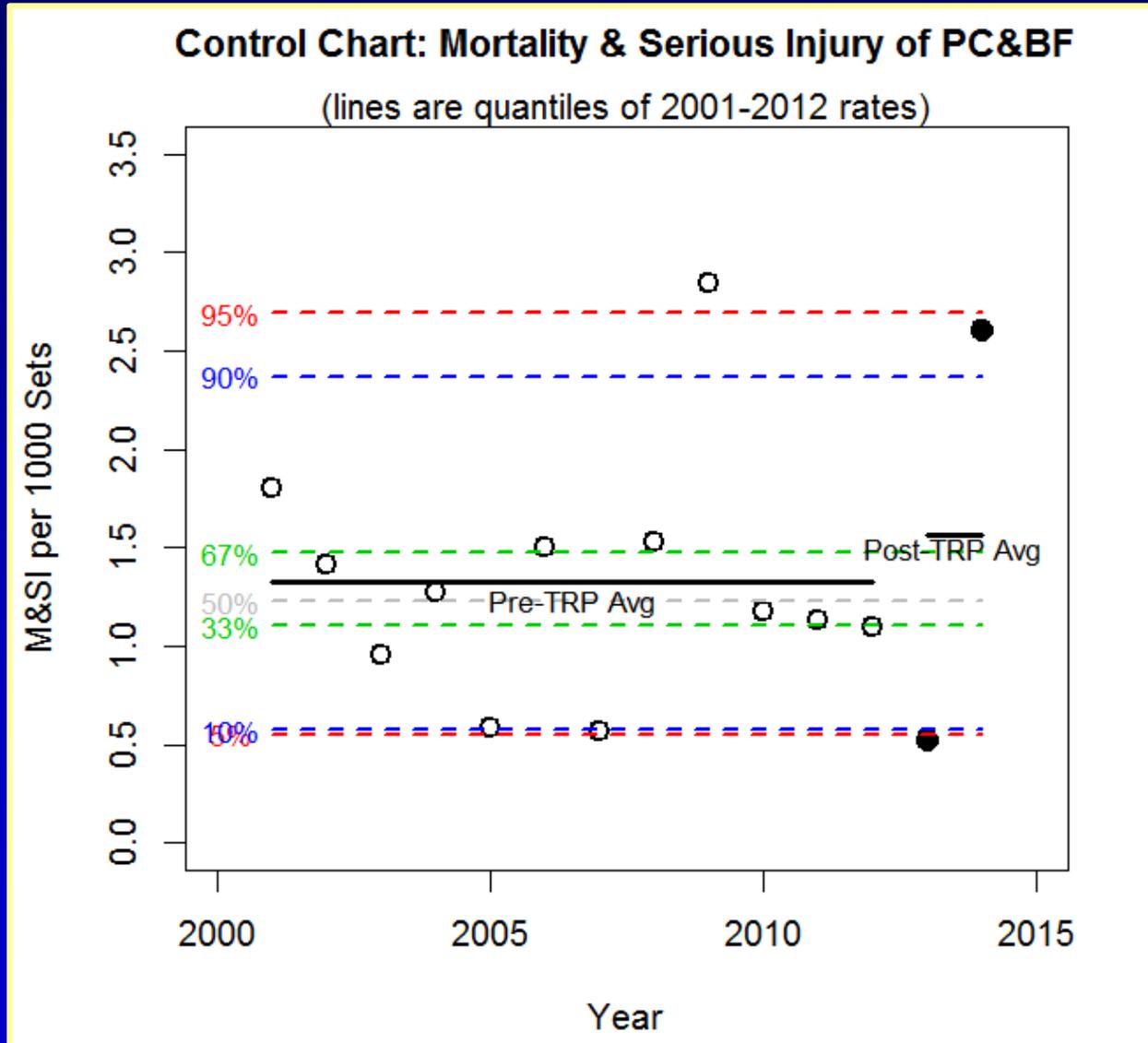
False killer whale and blackfish take and M&SI rates by EEZ area, 2001-2014



M&SI = mortality and serious injuries

(includes pro-rated interactions for which injury severity could not be determined)

False killer whale and blackfish mortality and serious injury (M&SI) rates, 2001-2014



Control Chart

- Visualization tool to assess post-TRP rates in context of variation observed in pre-TRP years
- ‘Outlier’ years (high/low) during both periods.
- No evidence of post-TRP reduction in M&SI rate

Statistical evaluation of pre-TRP and post-TRP M&SI rates using bootstrap test of difference

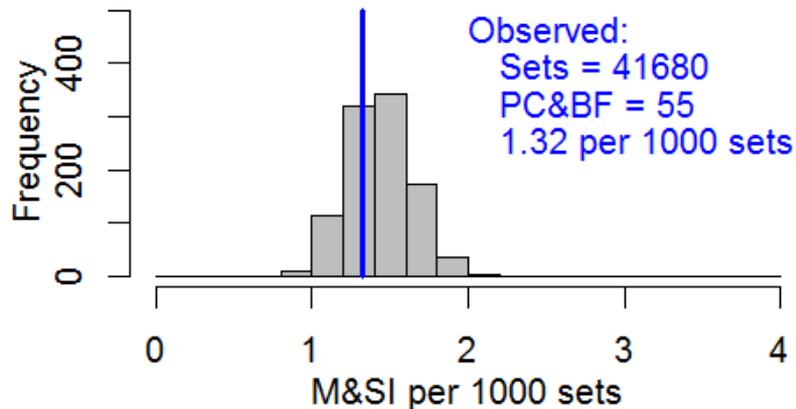
Mortality and serious injury rate

Observed post-TRP rate of M&SI is slightly greater than pre-TRP

Variation is large and this is not a significant difference ($p=0.338$)

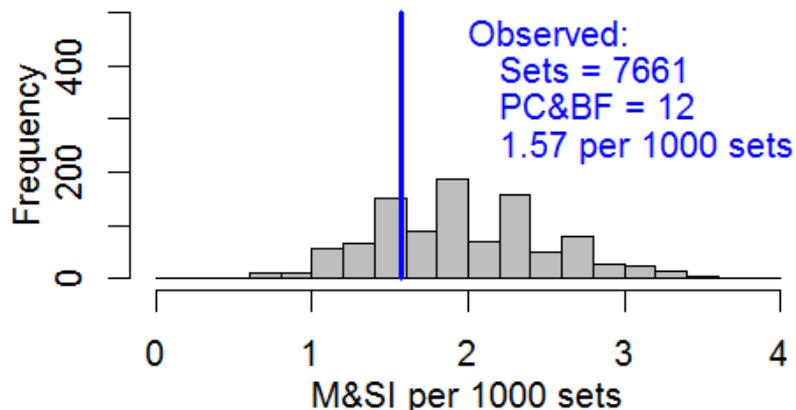
PC&BF: M&SI per 1000 sets

Bootstrap distribution, Pre-TRP

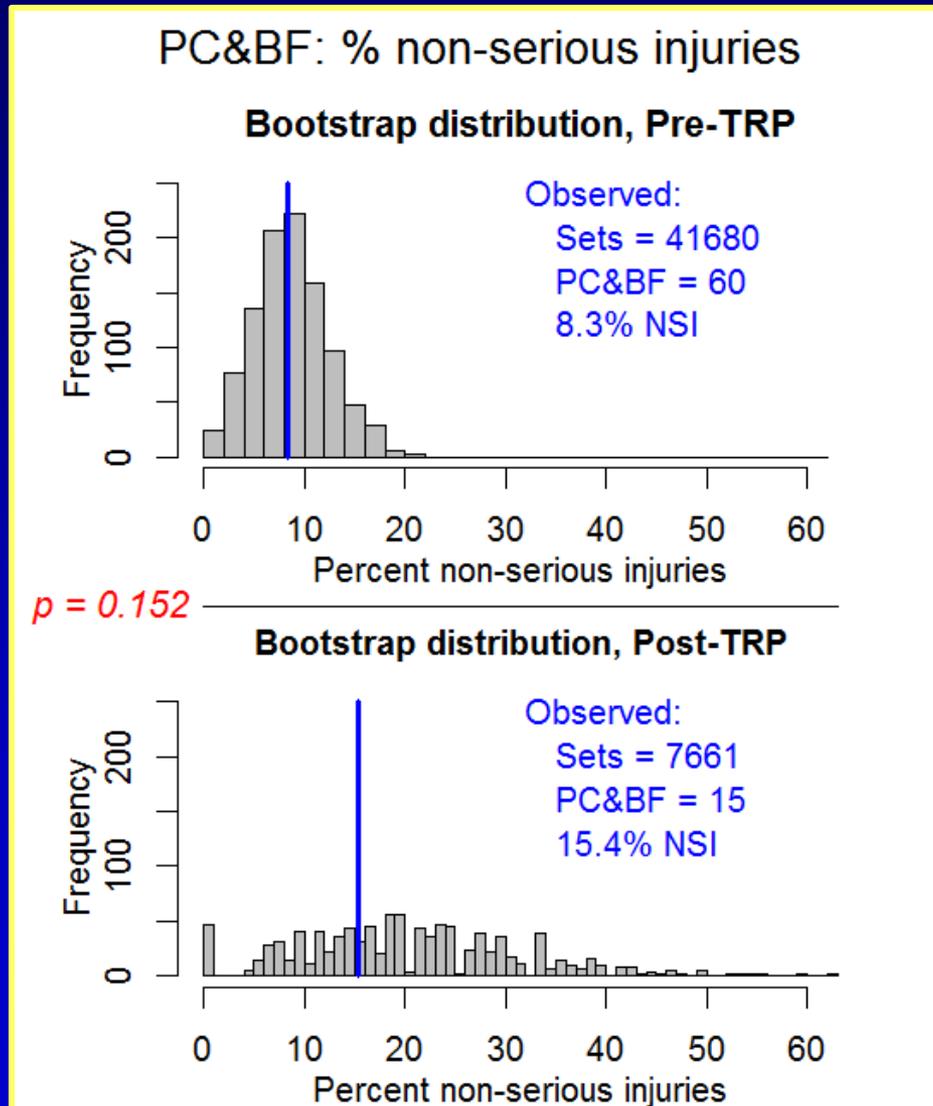


$p = 0.338$

Bootstrap distribution, Post-TRP



Have gear changes allowed a greater proportion of interactions to result in *non-serious* injuries?



Take Outcomes

- Dead
- Serious Injury
- Non-serious injury
- Cannot be determined

One measure of TRP success would be a statistically significant increase in the % non-serious injuries.

Observed % NSI is greater post-TRP, but variation is large and increase is not significant ($p=0.152$)

Can we estimate how long it will take to detect a post-TRP change?

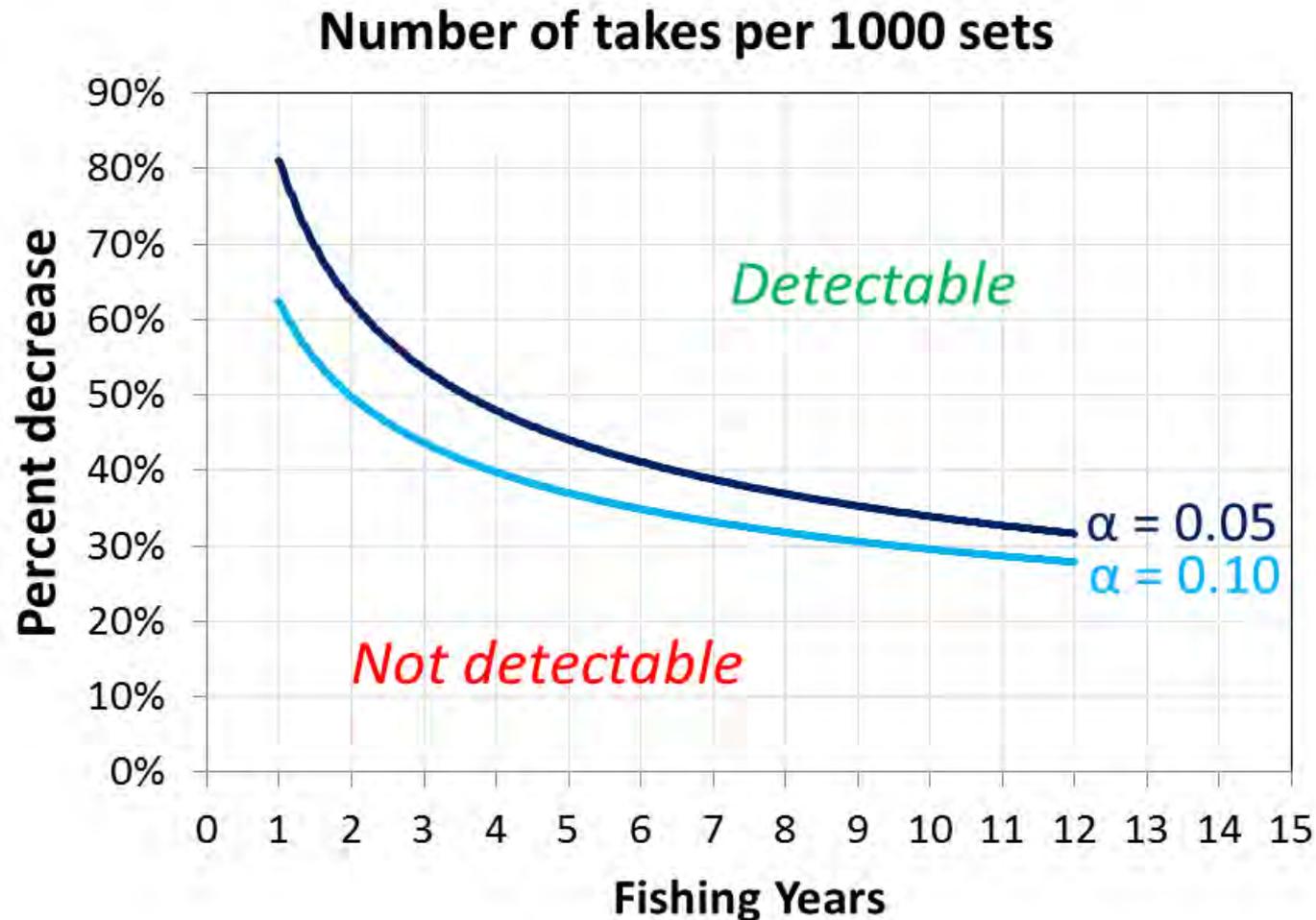
Bootstrap simulations:

- Use observer data to simulate a change
- Re-sample the simulated data to see if the change can be detected statistically, given the observed variation.

Mortality and serious injury (M&SI):

- Primary measure of TRP success (because it is compared to PBR)
- Affected by two different processes:
 1. Total false killer whale (and 'blackfish') takes
 2. Proportion of takes that are **non-serious** injuries

How long will it take to detect a decrease in total false killer whale takes?



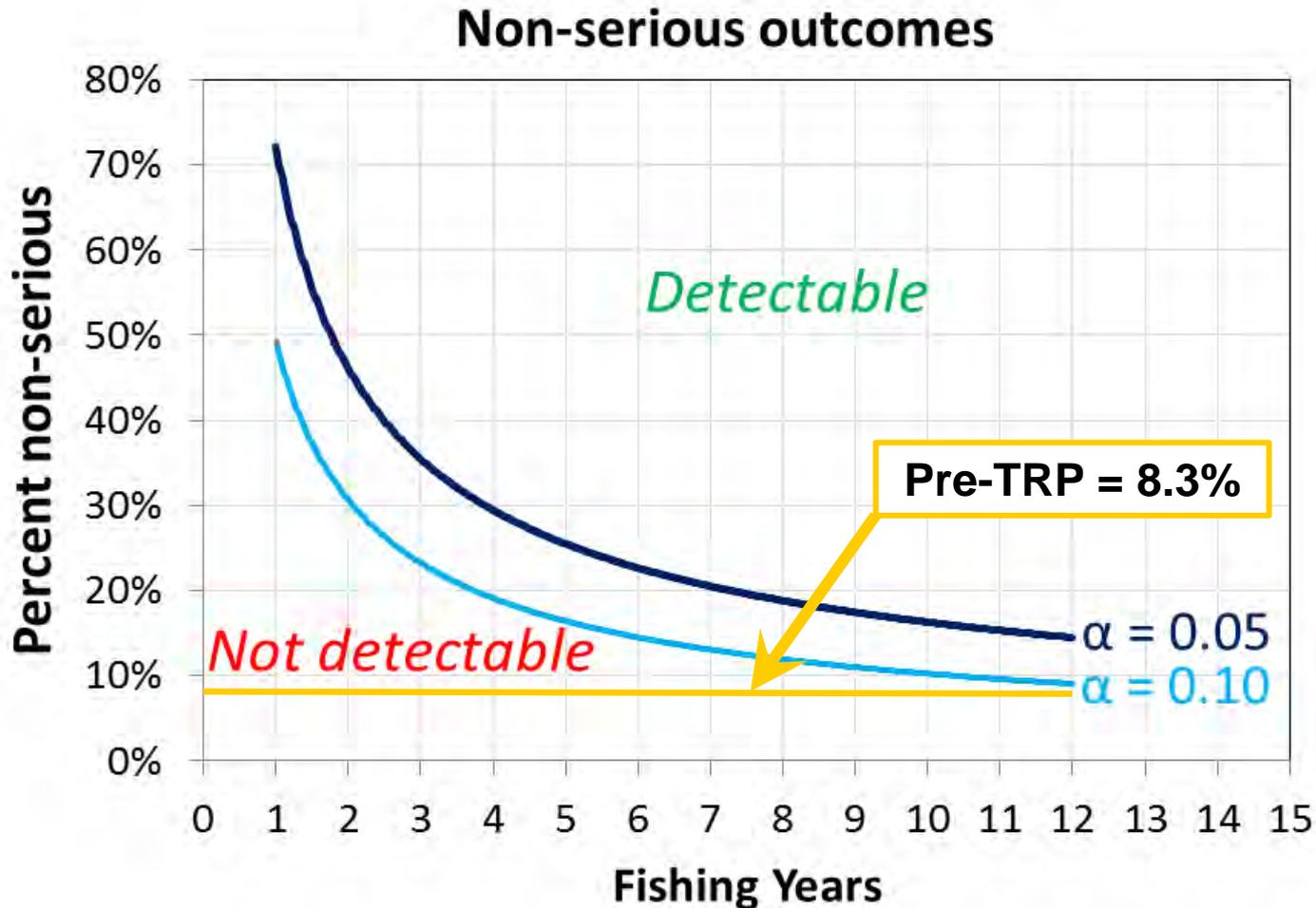
Bootstrap simulation results

Assumed 3,524 sets/year

Includes 'blackfish'

How long will it take to detect an increase in the proportion of non-serious injuries?

Bootstrap simulation results



Conclusions

- False killer whale take rates vary interannually.
- Cannot presently detect any post-TRP changes in M&SI rates or proportion non-serious.
 - **Good news:** Greater number of 2014 takes does not indicate things got worse.
 - **Bad news:** Greater % NSI does not (yet?) indicate things got better.
- Only large (40-50%) reductions in M&SI are detectable within 3-5 years.
- If present, an increase in the proportion of NSI to 25-35% (from pre-TRP 8.3%), should be detectable within 3-5 years.

Questions?

