

*Science, Service, Stewardship*



# MRIP New Statistical Catch Estimation Method

August 2011

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# Estimating Recreational Fishing Catch and Effort

NOAA Fisheries provides two estimates of recreational fishing activity:

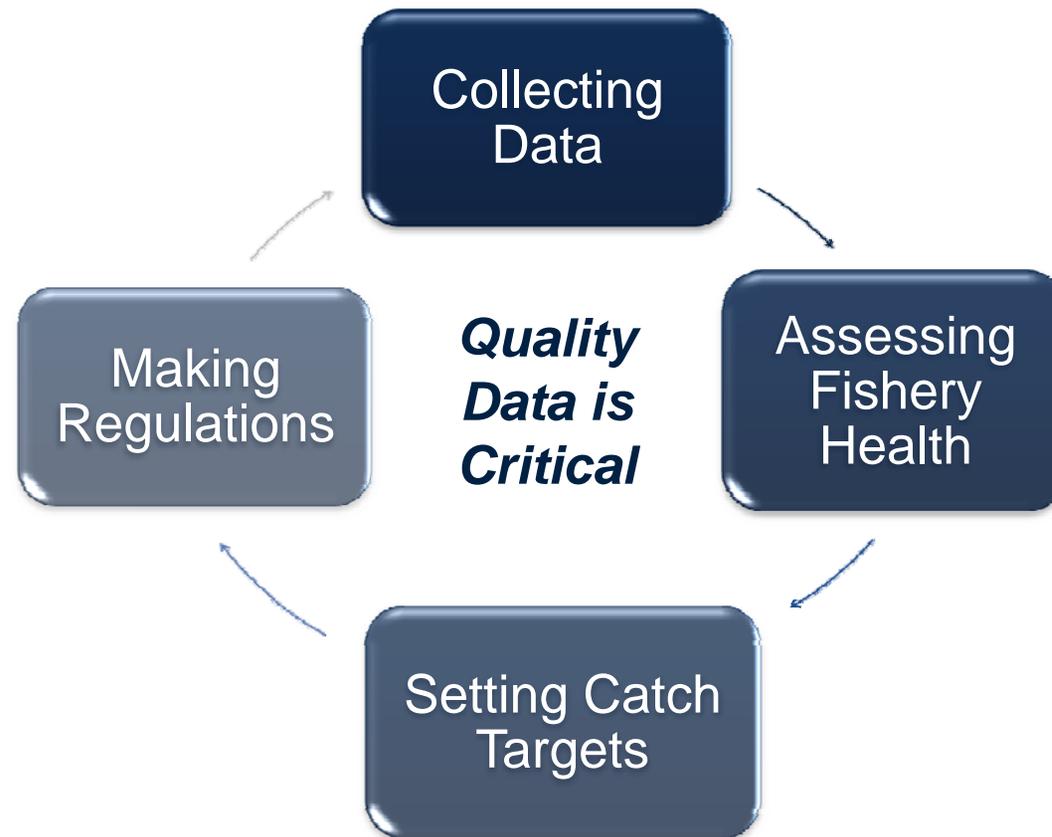
- **Catch**, or the number, species and size of fish caught.
  - Generally determined through shore-side intercepts.
- **Effort**, or the number of fishing trips taken during a particular reporting period.
  - Generally determined through telephone surveys.



## How Data Are Used

Fishery management decisions are based on a continuous cycle.

Our goal is to ensure fisheries remain productive – now and for generations to come.





# The Marine Recreational Information Program

Created in 2007 to address:

- Recommendations of the National Research Council's *Review of Recreational Fisheries Survey Methods*.
- New requirements of the 2006 Magnuson-Stevens Act.
- Stakeholder confidence in catch and effort estimates.



## NRC Findings on Catch Estimation Method

- Estimation process is not matched to how we gather data.
- Shore-side sampling methods emphasize maximizing angler intercepts at the expense of statistical rigor.
- These two factors inserted potential for bias into the point estimates and their precision.

*NRC recommended we fix both  
the way we estimate catch and the way we gather data.*

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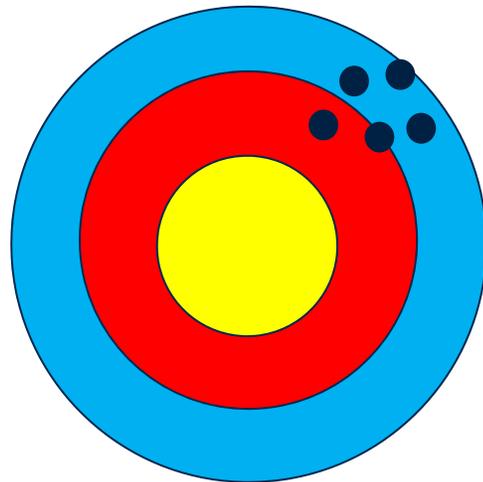
## Our Top Priority

# The potential for bias was the NRC's chief concern about MRFSS

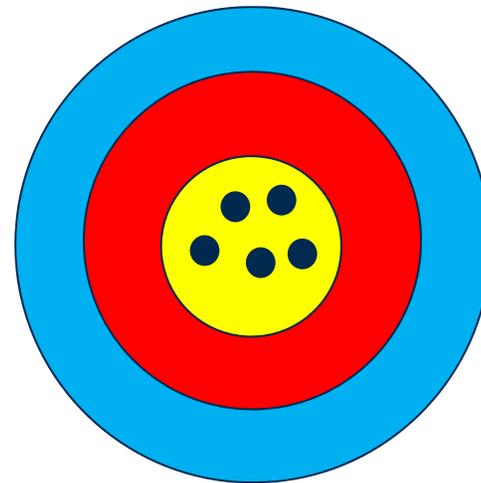
**potential for bias** is the result of unaccounted for  
factors or untested assumptions



# The Effect of BIAS



**Precise, but  
inaccurate**



**Precise and  
accurate**



## MRIP Responds to the NRC Findings – A New Catch Estimation Method

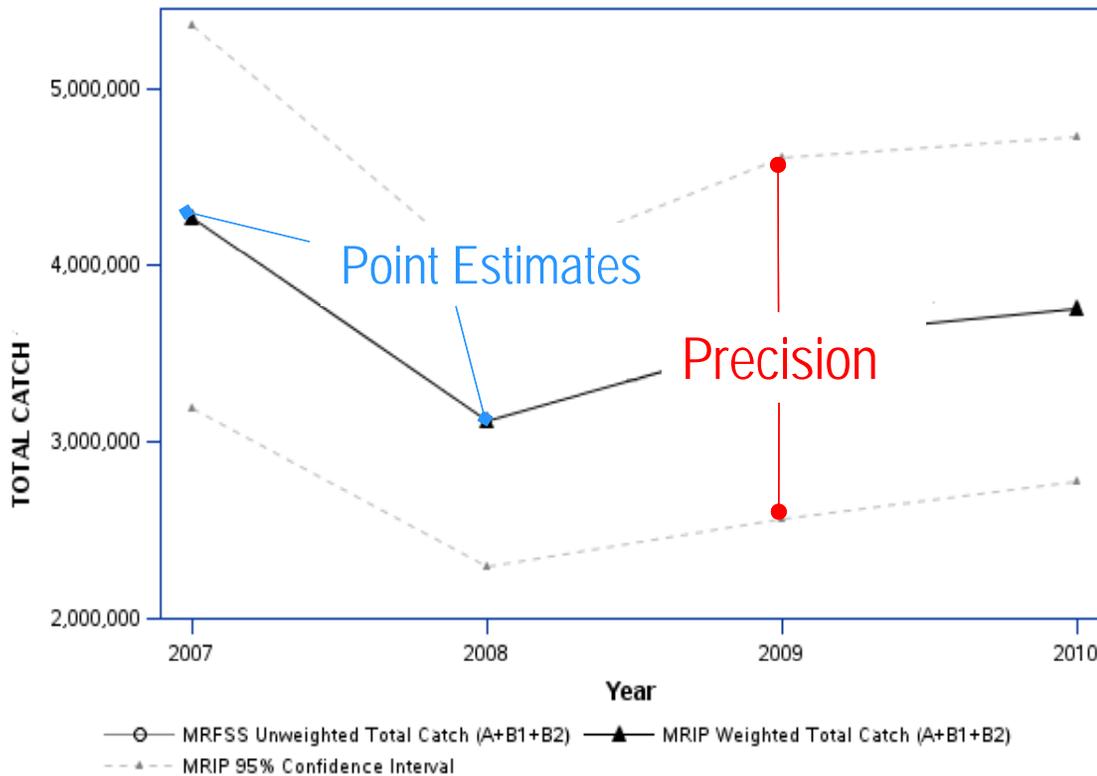
We've **eliminated the potential for bias** in the with a new catch estimation method by:

- Aligning the formulas we use to produce catch estimates with the way in which we collected catch data.
- Appropriately weighting data to account for sampler discretion in surveying **alternate sites**.
- Dropping **alternate mode** data chosen at samplers' discretion.

This peer-reviewed methodology, developed in partnership with leading experts in the field, ensures the new MRIP catch estimates will be free of design bias. 8



# Anatomy of an Estimate



Removing potential bias affects both the **point estimate** and its associated measure of **precision**, expressed either as the Percent Standard Error (PSE) or graphically as the Confidence Interval.



# Potential Impact of Changes

Changes in catch estimates can affect:

- **Stock assessment results**
  - Is the stock overfished? What's the biomass?
- **Management actions**
  - What's the appropriate catch limit? Are we under or over the catch limit?

Where there are significant changes in the estimates, revisions to fishing regulations may be necessary.



## What's Next

- Complete the new MRIP catch estimates for 2004 to 2011 and **release the updated estimates in Feb 2012.**
  - Ongoing QA/QC review of method, coding and programming, legacy data.
  - Parallel evaluation of estimates produced by new vs. old methodology.
  - Strategy for updating management to synchronize with improved estimates.



## Key Takeaways

- The new catch estimation method will yield **more accurate numbers** with a **known level of precision**.
  - Estimates can be made more precise through **committing the resources to increased sample sizes**.
- This exhaustively researched, peer-reviewed methodology is a **fundamental improvement** that allows for a range of future enhancements.
- Additional changes are underway to improve sampling methodology and address effort issues.

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## MRIP Questions

Contact us with questions at:  
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