

Science, Service, Stewardship



MRIP UPDATE: Improving Recreational Catch Estimation

HMS AP Meeting
September 20, 2011

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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.*



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 Statistical Team

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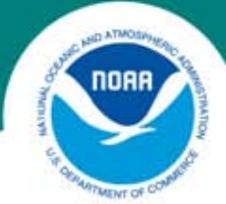


Potential Impact of Changes

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.
 - 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.



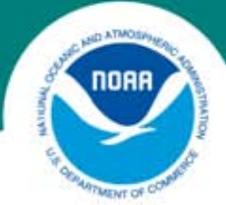
What's Next-2

- Improvements to the design of the Access Point Angler Intercept Survey (APAIS).
 - Reducing sampler discretion.
 - Enhancing statistical precision.
- Improvements to effort estimates.
 - Dual-frame mail/phone surveys
 - Use of National Saltwater Angler Registry.
- Enhancing precision through increased sampling.
 - Evaluating trade-offs of resource allocation.
 - Meeting requirements for ACLs and AMs



Other Upcoming MRIP Activities

- For-hire survey: Gulf pilot and beyond
- Timeliness Workshop: improving capability for in-season management
- Private Access undercoverage bias study
- Angler self-reporting programs workshop
- LPS & HMRFS
 - re-estimation
 - expansions/improvements



Re-estimation and Intercept Survey Changes:

- How MRIP differs from MRFSS, and significance of the changes
- Potential for revisions to LPS design



What's Changing with MRIP *Matching Sampling Designs*

What We've Done in the Past	What We're Fixing	Changes to New Catch Estimation Design	Changes to New Shoreside Sampling Design
<p>We assumed our shoreside sampling was random and therefore representative of the whole population of anglers.</p>	<p>Shoreside sampling design was not truly random, but rather a multi-stage cluster design.</p>	<p>The new estimation method is appropriate for a multi-stage cluster sample. Our designs for sampling anglers and estimating catch are now matched.</p>	<p>N/A. A multi-stage cluster sample design will still be used.</p> <p>We will emphasize getting complete counts of anglers and boats at sites sampled.</p>



LPS versus MRFSS

Matching Sampling Designs

- Similarities
 - LPS dockside sampling uses multi-stage cluster design
 - New estimation method will need to account for this
- Differences
 - LPS interview is boat-based; MRFSS is angler based
 - One less “stage” to worry about
 - LPS does not produce landings weight estimates
 - “stage” of selecting fish not a factor in landings number estimation
 - length frequency distributions could change
 - Counts of LPS boats on site likely more accurate than MRFSS angler counts



What's Changing with MRIP

Measuring Catch per Trip

What We've Done in the Past	What We're Fixing	Changes to New Catch Estimation Design	Changes to New Shoreside Sampling Design
<p>We assumed that catch sampled during peak times could accurately estimate catch across an entire 24-hour period.</p>	<p>We're testing the assumption that non-peak catch differs significantly from peak period catch.</p>	<p>The new estimation method is weighted to account for catch during all periods of the day.</p>	<p>We will sample sites during 4 specified six-hour blocks. Sampling during both peak and non-peak times will enable us to more accurately estimate catch across a whole day.</p>



LPS versus MRFSS

Measuring Catch per Trip

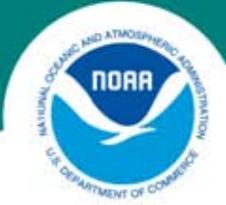
- Similarities
 - LPS also assumes that catch rates during peak sampling hours reflect catch rates across 24-hour period
 - New estimation method will likely need to weight data by time interval of trip return
 - New survey design will likely cover peak and off-peak times
- Differences
 - LPS trips generally return within a narrower time band compared to general survey trips
 - Potential for bias may be reduced as a result



What's Changing with MRIP

More Representative Sampling of Modes

What We've Done in the Past	What We're Fixing	Changes to New Catch Estimation Design	Changes to New Shoreside Sampling Design
<p>Samplers' site assignments were selected based on the pressure rating by mode, day type and month. However, samplers had discretion to sample alternate mode trips that they observed occurring at the assigned site.</p>	<p>The selection probability of the site for the alternate modes sampled cannot be determined. Therefore, it is not possible to weight the estimate to account for the true selection probability.</p>	<p>Data collected for "alternate mode" trips sampled at primary assigned sites will not be used in new estimates.</p>	<p>Samplers will only collect data for the mode for which the site was selected.</p>



LPS versus MRFSS *More Representative Sampling of Modes*

- Similarities
 - LPS also allows for “alternate” mode sampling (private & charter)
- Differences
 - Mode switching likely won't be an issue for LPS since private and charter mode vessels were equally available to interviewers on all LPIS assignments



What's Changing with MRIP

More Representative Sampling of Sites

What We've Done in the Past	What We're Fixing	Changes to New Catch Estimation Design	Changes to New Shoreside Sampling Design
<p>Site assignments were based on PPS sampling based on the pressure rating by mode, day type and month. However, samplers were allowed to move to an alternate site of their choice after 2 hours if there was little or no activity at the assigned site.</p>	<p>The selection probabilities of the alternate sites were not known. Therefore, the estimates were not weighted properly to account for the alternate site selection probabilities.</p>	<p>Selection probabilities of the alternate sites have been estimated (model-based method), and the estimates have been re-weighted to account for them.</p>	<p>Samplers will conduct interviews at a specific cluster of sites in a specific randomized order for the full time period, ensuring more structured sampling and less sampler discretion.</p>



LPS versus MRFSS

More Representative Sampling of Sites

- Similarities
 - Catch data will need to be weighted appropriately according to time spent at each site
 - Selection probabilities within a cluster of sites may be difficult to determine: start site, time spent and order not pre-defined
- Differences
 - LPS interviewers do not choose alternate sites
 - LPS already selects “clusters” of sites for sampling



LPS versus MRFSS Estimating *Effort*

- MRFSS
 - Major recommendation of NRC report for MRFSS was establishment of a registry of anglers for sampling
 - State licenses and federal registry will be incorporated in newly designed effort surveys
- LPS
 - Effort survey sampling frame based on HMS permits
 - Adjustments made for off-frame trips based on dockside survey
 - Response rates significantly higher than CHTS
 - Non-response bias will be evaluated in MRIP pilot in 2012



LPS versus MRFSS Tournament Sampling

- MRFSS
 - Tournaments sites not covered in MRFSS intercept survey
 - Will be covered in new MRIP intercept survey design
 - New estimation design will appropriately account for tournaments
- LPS
 - Tournaments are currently sampled if randomly selected
 - New estimation design will appropriately account for tournaments



Key Takeaways

- The new estimation methods 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.
- We will be working closely with MRIP state and federal partners as we proceed with implementation