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FES Development, Review, and Transition

An Overview of a Multi-year Process

Development

The FES is the result of
extensive testing and analysis



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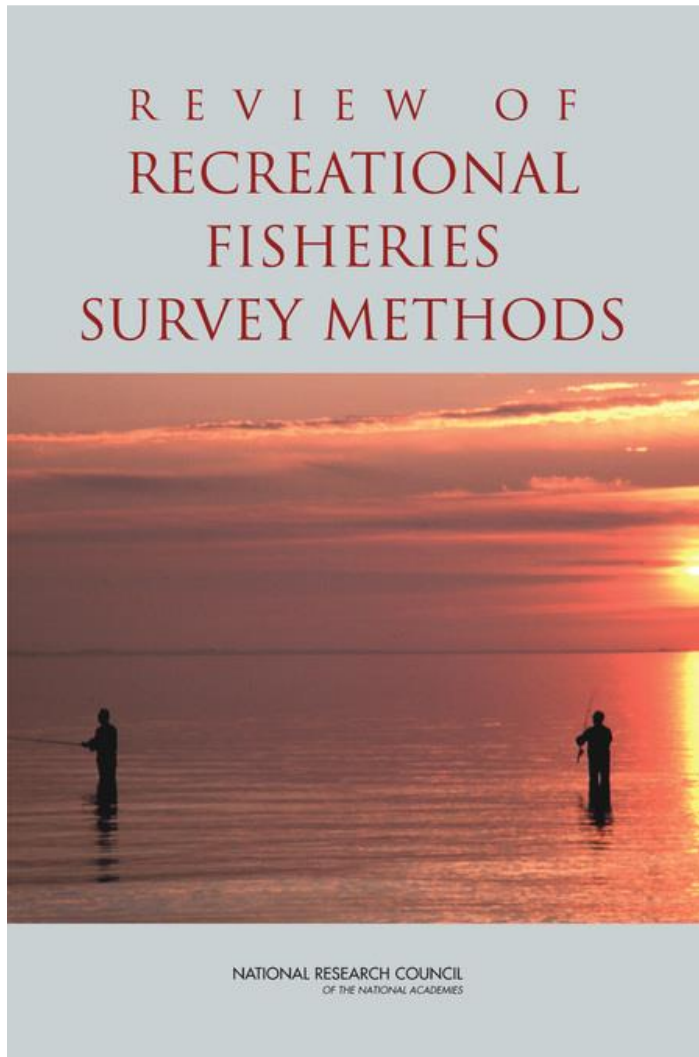


In 1979, the Coastal Household Telephone Survey began to collect data about angler effort.



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Limitations of the CHTS



In its 2006 review of marine recreational fisheries data collection in the United States, the National Research Council acknowledged the known limitations of landline-based random-digit dialing.

Limitations of the CHTS

National Research Council Findings (2006)

- The CHTS suffered from **inefficiency**.
- Declining response rates increase the risk of **nonresponse bias**.
- The survey's restriction to coastal counties and landline-based telephones may have contributed to **coverage bias**. Landline sampling methods were increasingly complicated by the growing use of cell phones.



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Limitations of the CHTS

National Research Council Recommendations (2006)

- A comprehensive, universal sampling frame of licensed saltwater anglers should be established
- In the absence of such a list, a dual-frame procedure that samples from lists of licensed anglers and lists of residential households should be used

Magnuson-Stevens Act Reauthorization (2007)

- Establish a National Saltwater Angler Registry



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Pilot Studies

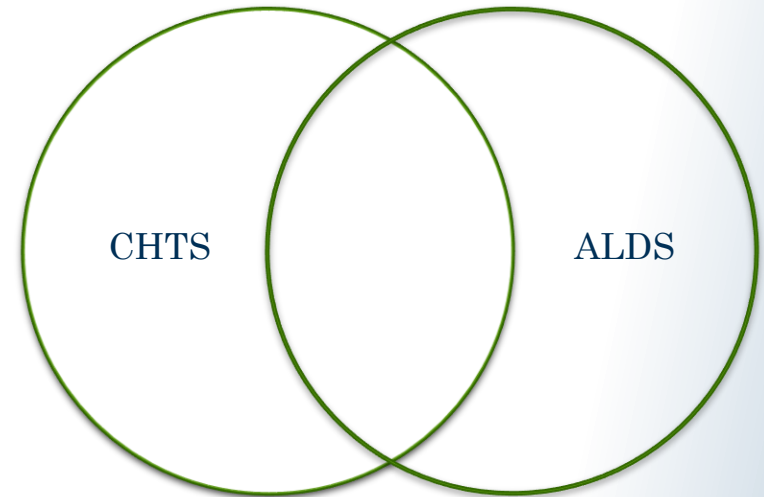
- Design an improved method for estimating fishing effort
- Maximize efficiency by incorporating fishing license information
- Maximize response rates
- Evaluate non-sampling errors and bias

Pilot Studies: Angler License Directory Telephone Survey (2007-2012)

- Sampled from state lists of licensed saltwater anglers
- More efficient for identifying anglers
- Gaps in coverage
- Limited improvements in response rates

Pilot Studies: Dual-Frame Telephone Survey

- Integrated CHTS and ALDS sampling
- Improved coverage, but gaps remained
- Approach for defining dual-frame domains is unreliable
- Both component surveys achieved low response rates



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Pilot Studies: Dual-Frame Mail Survey (2009-2010)

- Sampled from license lists and address frames
- Self-administered mail survey
 - License sample: single-phase data collection
 - ABS: two-phase data collection
- Nearly complete coverage
- Higher response rates than the CHTS, ALDS
- Approach for defining domain more effective but still prone to error
- Two-phase design was costly and time consuming



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Pilot Studies: Dual-Frame, Mixed-Mode Survey (2012)

- Sampling identical to dual-frame mail survey
- ABS screening completed via mail
- Topical sample allocated into mail and phone treatments
- Mail surveys
 - Higher response rates
 - Produce stable estimates within existing estimation schedule
 - Less susceptible to bias resulting from recall error, coverage error, nonresponse error
- Mail surveys are a feasible alternative to the CHTS



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Pilot Studies: Fishing Effort Survey Design (2012-2013)

- License databases used to stratify address sampling
- Data collected in single phase
- Tested incentives and multiple versions of questionnaire
- Demonstrated the benefits and feasibility of the FES design

A Spotlight on Non-Response

Challenge

- A fishing-related mail survey has the potential to receive more responses from avid anglers than from less avid or non-anglers – “Avidity Bias”

Potential Impact

- Differential response would over-represent anglers and overestimate fishing effort

Mitigation

- The FES is presented as a Weather and Outdoor Activity survey and includes a \$2 incentive

A Spotlight on Non-Response

Identifying Potential for Bias

- FES data demonstrate that households with licensed anglers are more likely to respond to the survey and to report fishing activity

Reducing Potential for Bias

- Weighting adjustments account for the differential response between households that do and do not match to license databases



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A Spotlight on Non-Response

Non-Response Follow-up Study (2012-2013)

- During each wave of the 14-month study, a sample of 320 nonresponding households was mailed a follow-up questionnaire and an additional \$5 cash incentive
- The study found no significant differences in fishing activity between initial respondents and follow-up respondents
- Ongoing comparisons show a similar lack of difference in fishing activity between early and late FES responders
- These results suggests that nonresponse is not a significant source of bias and demonstrates the effectiveness of FES weighting adjustments



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FES Development

By the Numbers

8

Years spent developing and testing methods of data collection

9

States where methods were tested

5

Pilot studies conducted

3

Independent reviews



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Final Recommendations

- The FES design is a **feasible alternative** for collecting recreational fishing data
- The FES design produces **higher response rates** and gives respondents more time to complete the survey, which we believe leads to **more accurate responses** to questions about fishing activity
- The FES can generate stable effort estimates **within the CHTS' estimation schedule**
- The FES sampling design is **more efficient** than simple random sampling

Recommendations continue on next slide.



Final Recommendations

- The FES design is **less susceptible to bias** resulting from non-response and non-coverage
- Address-based sampling provides **more representative samples** than landline random-digit dialing
- The FES design is **a superior approach** for monitoring recreational fishing effort



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Peer Review

The FES has been reviewed by NOAA Fisheries staff, external expert consultants, independent peer reviewers, and a committee convened by the National Academies.



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Peer Review Process

- Staff from NOAA Fisheries' Office of Science and Technology provided substantive review
- Three independent peer-reviewers were selected by the American Statistical Association's Survey Research Methods Section
- Five members of an external expert consultant team also provided reviews

Reviewers provided comments on the methods, results, and conclusions described in the final project report

Peer Review Comments

I can find nothing of concern in the methods, analyses, or conclusions.



The research...is sturdy and the results...convincing.

The single phase mail survey...is the clear winner.

The Project Report was reviewed and its approval recommended by the MRIP Operations Team and Executive Steering Committee, and the design was certified as scientifically valid



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National Academies Review

Committee on the Review of the Marine Recreational Information Program

- Luiz Barbieri, Co-Chair (Florida Fish and Wildlife Conservation Commission)
- Cynthia M. Jones, Co-Chair (Old Dominion University)
- Jill A. Dever (RTI International)
- David Haziza (Université de Montréal)
- Jeffrey C. Johnson (University of Florida)
- Bruce M. Leaman (International Pacific Halibut Commission)
- Thomas J. Miller (University of Maryland Center for Environmental Science)
- Sean P. Powers (University of South Alabama)
- Steve Williams (Pacific States Marine Fisheries Commission)



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National Academies Review



Findings

“The methodologies associated with the current FES, including the address-based sampling mail survey design, are **major improvements** from the original Coastal Household Telephone Survey”

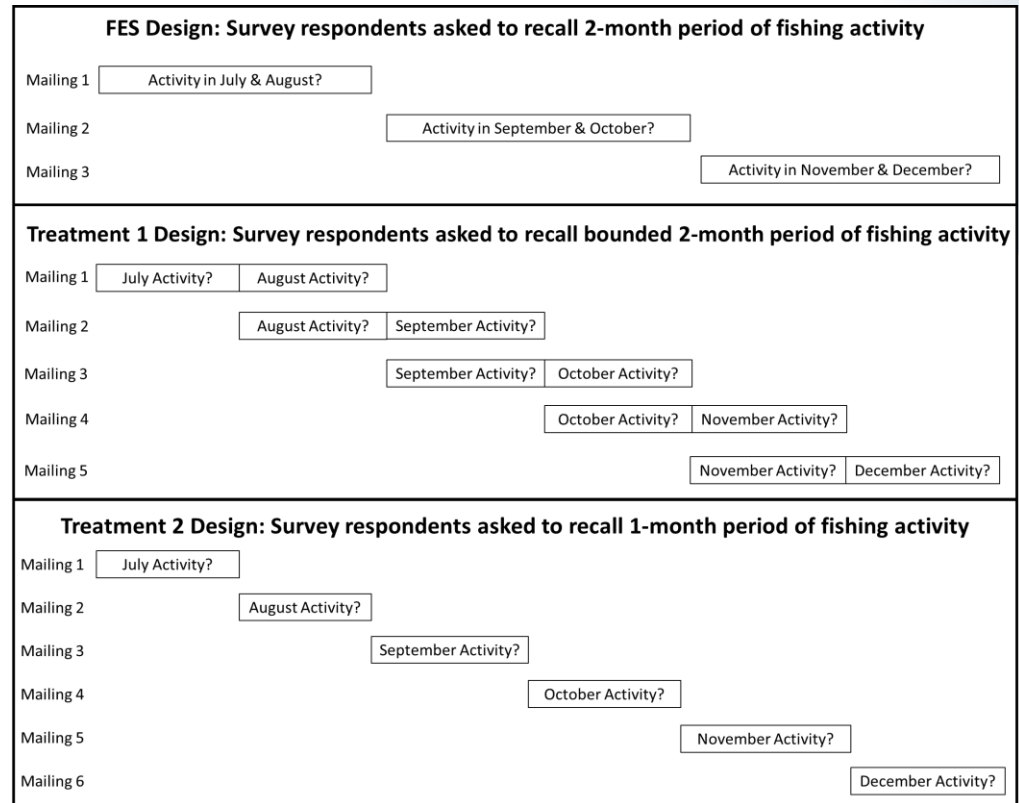
National Academies Review Effort Survey Recommendations

- Continue to evaluate the cognitive properties of a two-month recall period*
- Consider evaluating a prospective data collection methodology and continue to research survey panels*
- Consider conducting targeted annual non-response studies
- Evaluate the use of electronic data collection*
- Evaluate variables on the sampling frame*
- Evaluate other variance estimation methods

MRIP Response to Date

Properties of 2-month recall period

- Pilot study to examine the impact of reference period on recall
- Compared FES to shorter recall period
- No significant differences in estimates



MRIP Response to Date

Consider evaluating a prospective data collection methodology and continue to research survey panels.

- Tested longitudinal mail survey to estimate annual fishing participation
- Longitudinal estimates were not significantly different from FES estimates of participation
- Results suggest that the prospective, panel approach did not result in more accurate estimates



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MRIP Response to Date

Evaluate the use of electronic data collection.

- In 2018, we initiated a pilot study of a “web push” design that encouraged participants to respond to the FES through a computer or mobile device
- Study results are currently being evaluated
- The decision to implement a web push design will evaluate response rates, respondent representativeness, reported fishing activity, timeliness, and cost



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Transition

A cross-disciplinary Transition Team has guided the transition to a new and improved survey design



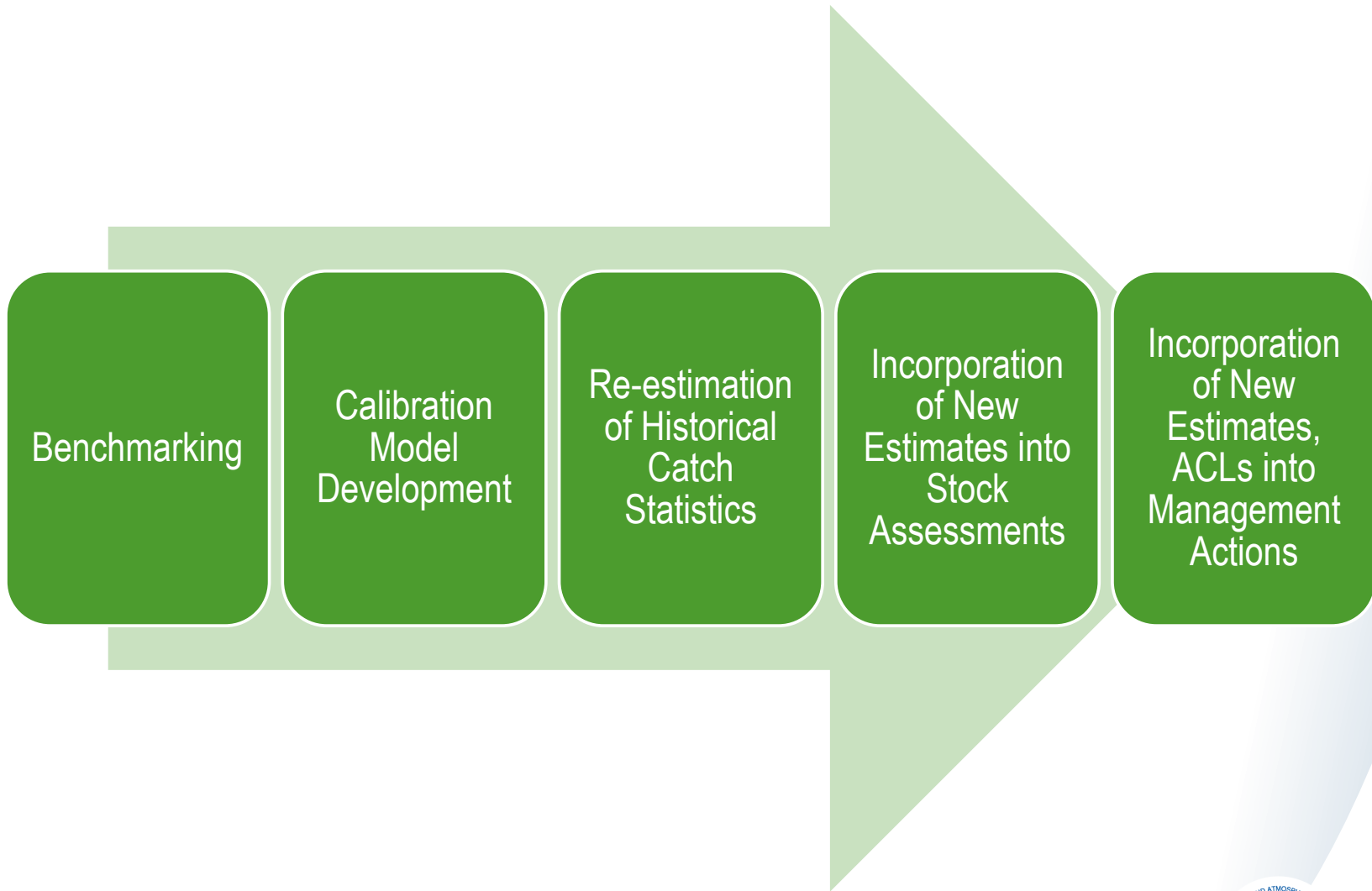
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Transition Planning

Goals

- Appropriately integrate revised estimates into stock assessments and management actions
- Create a replicable process for implementing new or improved scientific methods
- Build stakeholder support, understanding, and engagement in implementing the new survey
- Advance the mission of NOAA Fisheries

Transition Planning



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FES Transition Timeline

- 2014** A Transition Team comprised of state and federal partners, scientists, stock assessors, and managers is established to foster the transition to new and improved sampling and estimation designs
- 2015** NOAA Fisheries publishes Policy Directive 04-114
- The Transition Team develops a transition plan
- Benchmarking begins



FES Transition Timeline

2016 NOAA Fisheries explores stock assessment scenarios

NOAA Fisheries works with independent expert consultants to evaluate differences in CHTS and FES statistics, explore possible sources of bias

The development of a calibration model begins

FES Transition Timeline

2017

The calibration model is peer reviewed, unanimously endorsed, and approved. The peer review workshop includes members of the Center of Independent Experts and Mid- and South Atlantic SSCs, and is accessible via webinar

Historical statistics are re-estimated

The CHTS is discontinued

FES Transition Timeline

- 2018** New estimates are incorporated into stock assessments
- 2019** We are working with states, marine fisheries commissions, and fishery management councils to respond to questions and concerns about the reasons different recreational fishing surveys have produced different estimates of recreational catch

Questions?



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