



# ANGLER NONRESPONSE IN STEELHEAD REPORT CARD PROGRAM

*Oncorhynchus mykiss*

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# Introduction & Acknowledgments

- *Human dimensions of angler nonresponse in California's recreational steelhead fishing report card program (Gusman Costa and Hause 2023)*
- Many current and former department staff have contributed to the Steelhead Report and Restoration Card Program (SRCP)



# Presentation Outline



- Report Card Background
- Current Issues with the SRRCP Dataset
- Nonresponse Bias
- Evaluating Trends & Angler Attributes
- Next Steps For Management



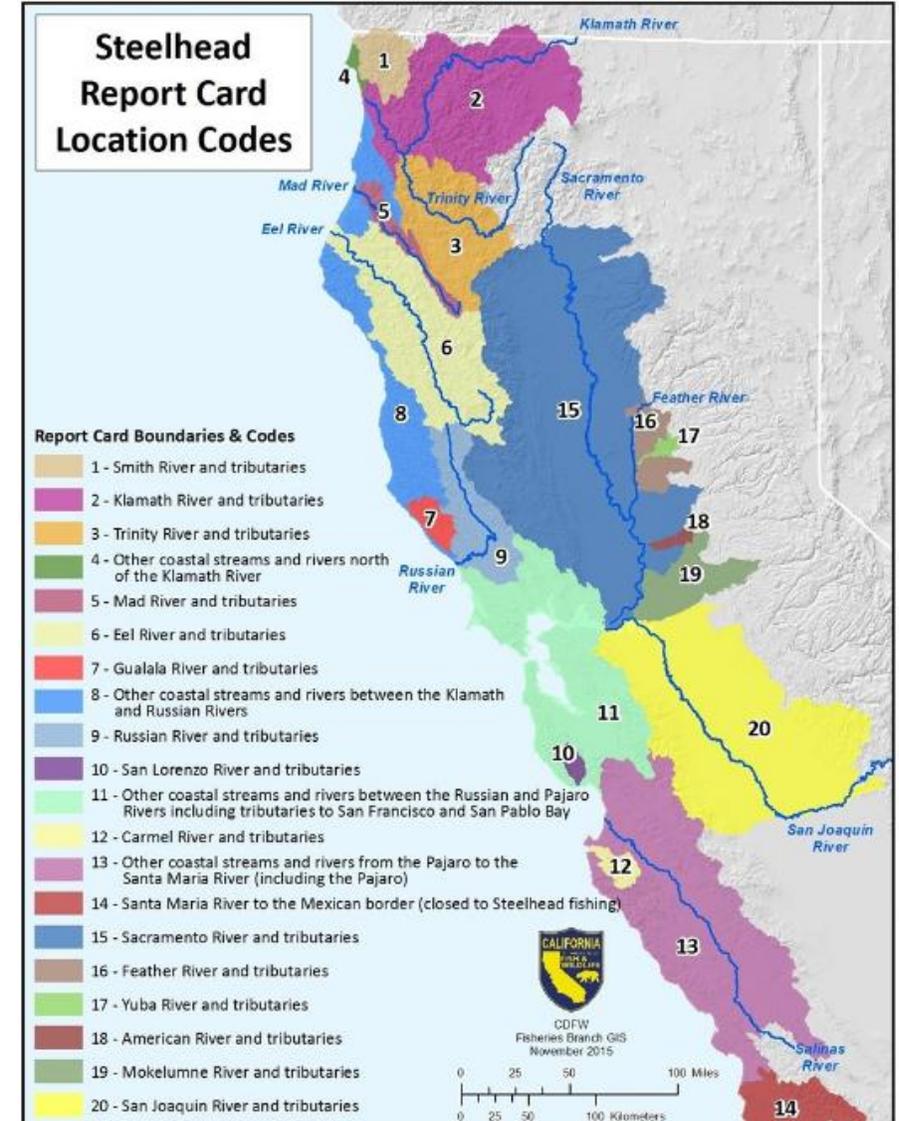
# Steelhead Report Card History

- 1999
  - Report Card was modified to include both wild and hatchery produced steelhead
- 2003
  - Began implementation of “Did Not Fish”
- 2004
  - SHRRC now required anglers to return their report card annually
- 2006
  - Changed name of card from “Catch Card” to “Fishing Card”
  - Required card to be filled out prior to beginning fishing and if moving locations
  - Required anglers to immediately record catch information upon keeping a steelhead and released steelhead upon completion of a trip
- 2009
  - Online reporting became available

<input type="checkbox"/> DID NOT FISH FOR STEELHEAD						
STEELHEAD REPORT & RESTORATION CARD						
Month	Day	Location Code	Wild Released	Hatchery Kept	Hatchery Released	Hours Fished
8	4	5				

# Issues Faced by the SRRCP

- Delayed Data Processing
  - Steelhead runs overlap the calendar year
- Low Resolution
  - There are only 20 location codes
- **Nonresponse Bias**
  - **Historically ~30% of report cards are returned annually**
  - **Potential differences in fishing activity between respondents and nonrespondents**
  - **Unable to produce reliable estimates**



# Addressing Nonresponse

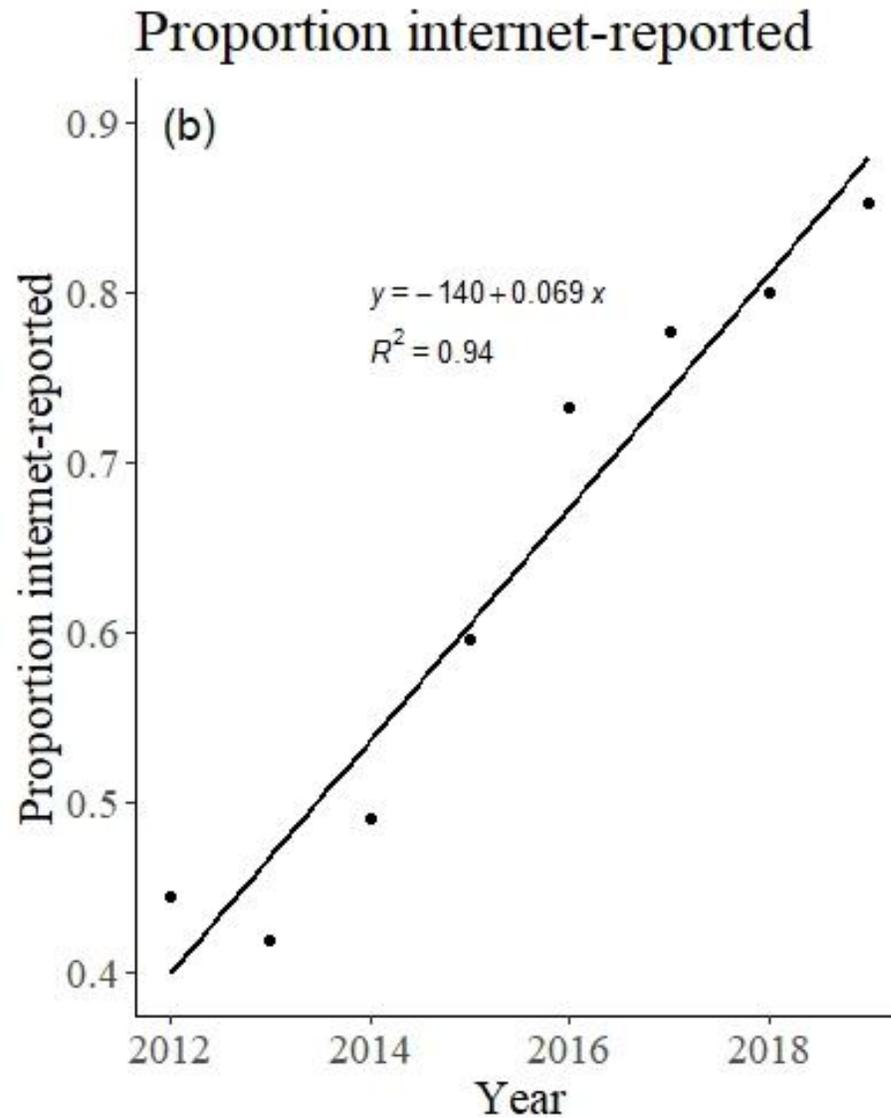
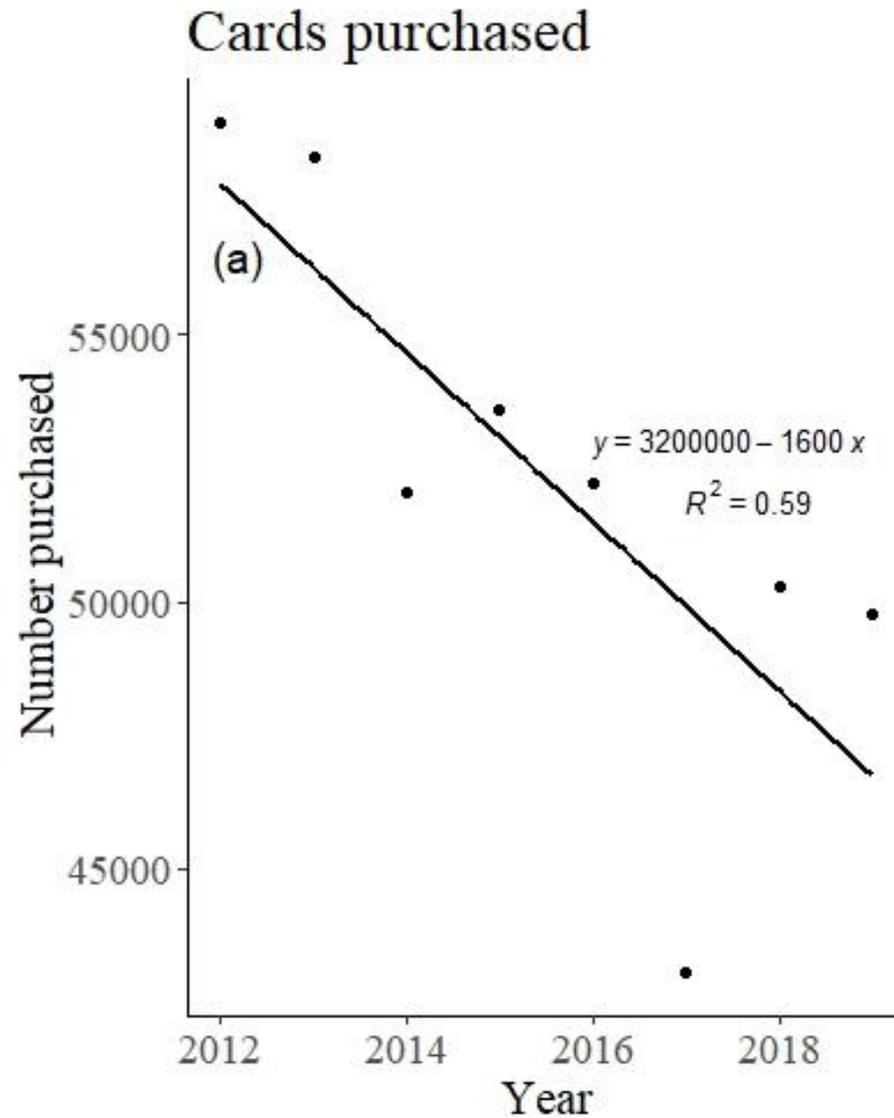
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- Questions Needing Addressed
  - What are the current trends in reporting rates and methods of reporting (online vs mail)?
  - Can we determine any relationships between angler attributes and likelihood of returning a card?
- Available Data
  - Automated License Data System (ALDS)
    - Hunting and Fishing License Customer Data
    - Vessel Permits
    - All Angler and Hunter Report Cards
  - 2012-2019 (8 report card years)

# Report Card Trends (Cards Sold & Returned)

Year	Cards Purchased	Cards Returned	% Returned	% Online
2012	58,993	25,255	42.8	43.5
2013	58,337	15,501	26.6	40.5
2014	52,061	15,132	29.1	47.8
2015	53,598	17,368	32.4	58.4
2016	52,210	19,089	36.6	72.2
2017	43,045	16,666	38.7	76.8
2018	50,309	17,882	35.5	79.0
2019	49,794	16,988	34.1	84.5
<b>Average</b>	<b>52,293.38</b>	<b>17,985.12</b>	<b>34.4</b>	<b>62.3</b>

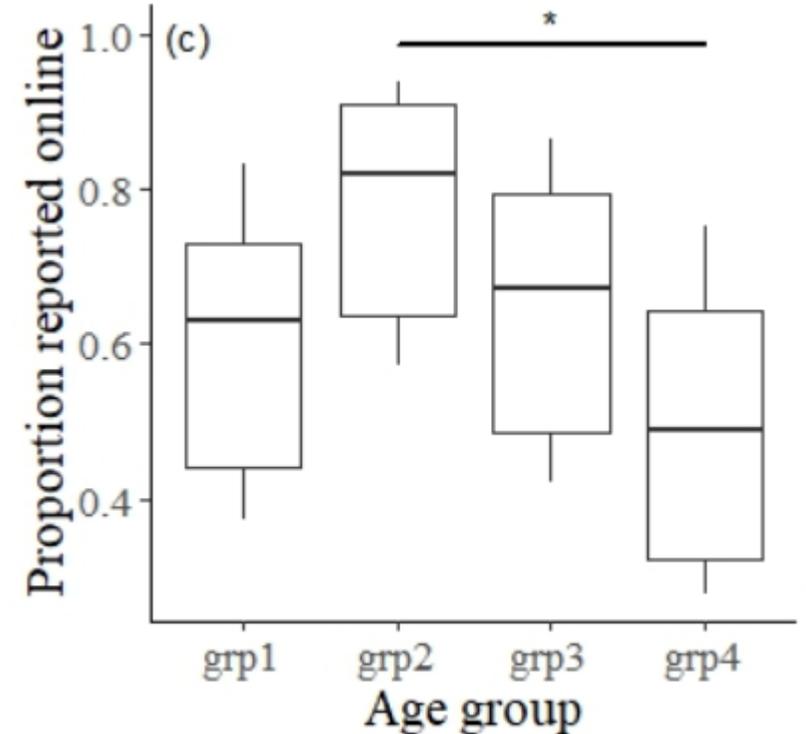
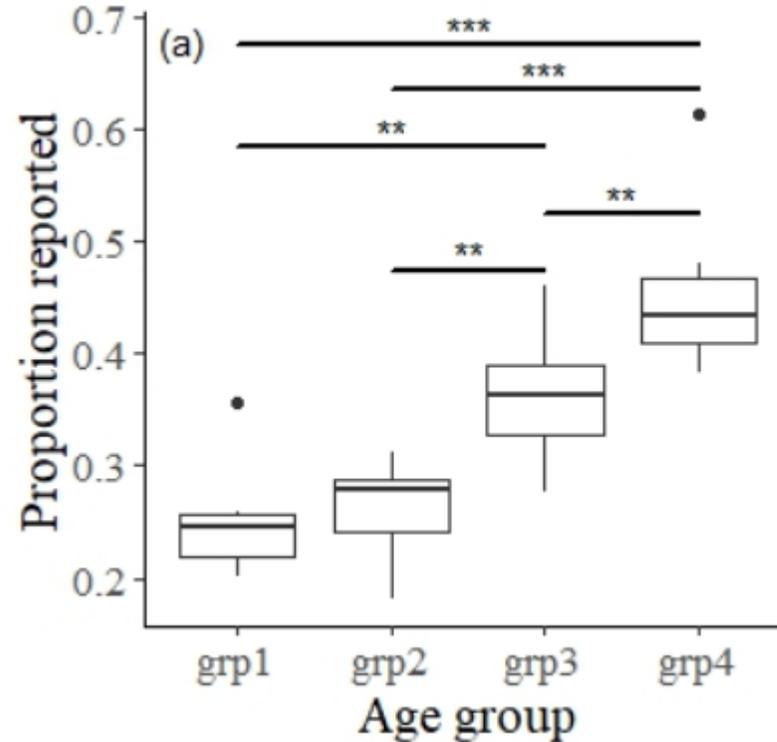
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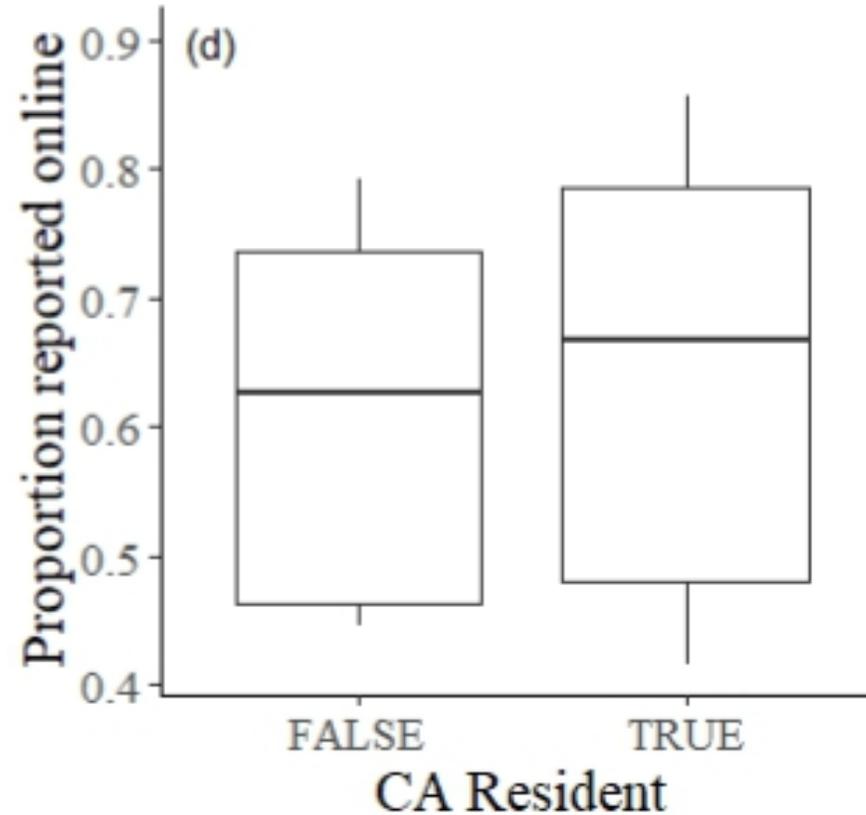
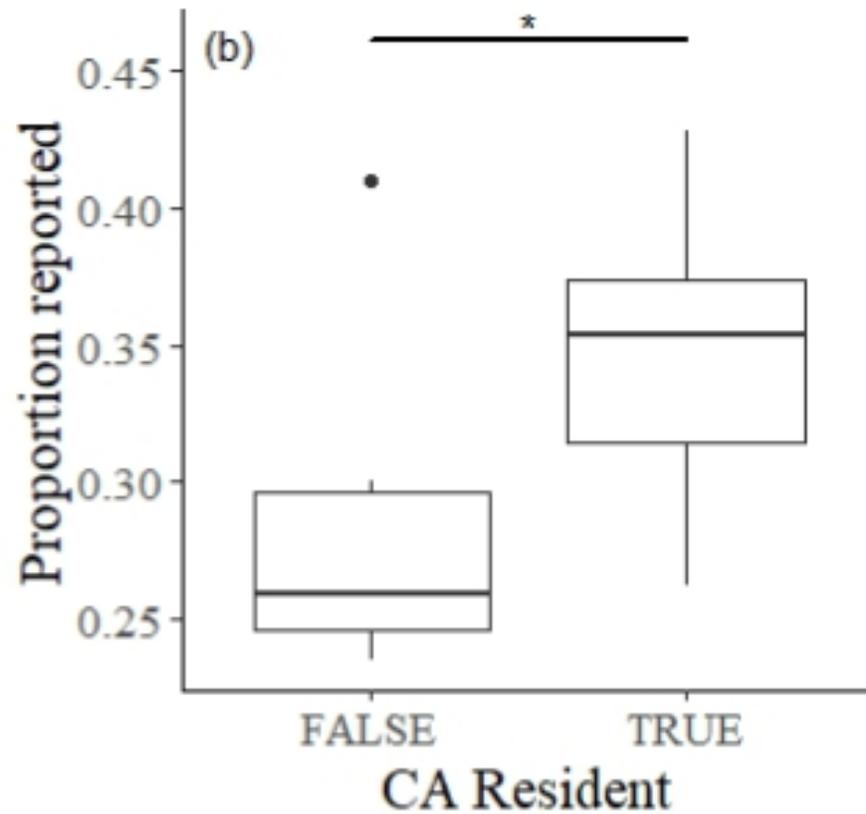
# Report Card Trends (Age)

- Grouped anglers in four age groups

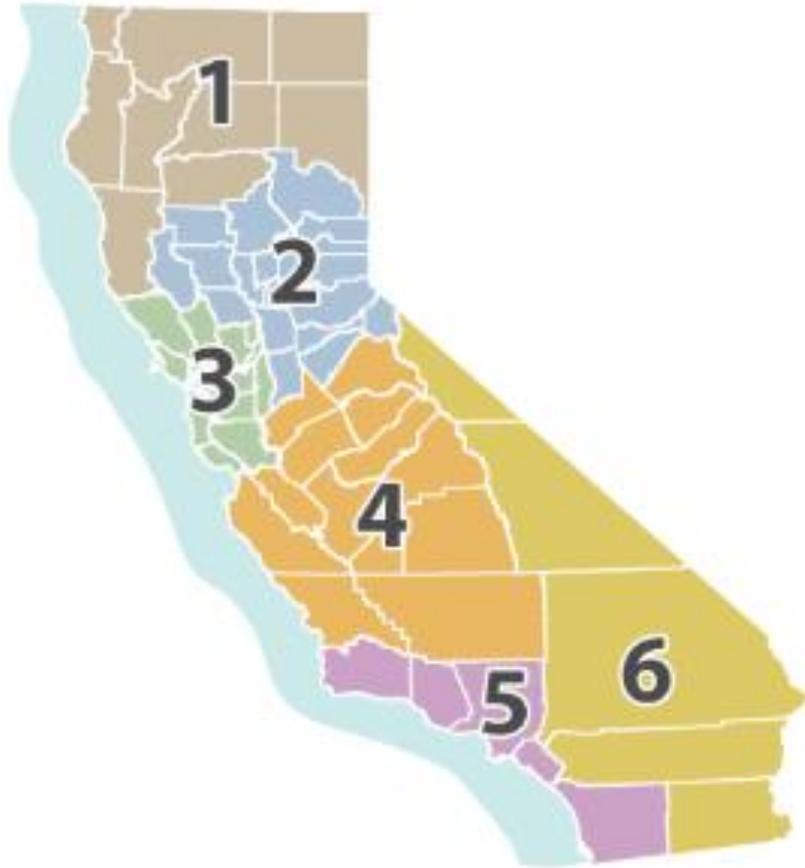
- Children-Adolescents
  - 5-19 years old
- Young Adults
  - 20-39 years old
- Middle Aged Adults
  - 40-64 years old
- Older Adulthood
  - 65+ years old



# Report Card Trends (Residency)



# Modeling Angler Attributes Towards Likelihood to Return Report Card



1. Age
  - Annual Age
2. Region
  - Follows CDFW's geographic regions
3. License Type
  - Lifetime or Annual
4. Year Quarter
  - January – March
  - April – June
  - July – September
  - October – December
5. Purchase Frequency
  - Infrequent (<3)
  - Frequent ( $\geq 3$ )

# Angler Attributes- Age

- Positive effect on return rate
- Increase in age by one year increased odds of reporting by 1.4%

Variable	P-value	Odds Ratio
Age	< 0.001	1.014
Region 2 (North Central)	< 0.001	1.079
Region 3 (Bay Delta)	< 0.05	0.966
Region 4 (Central)	< 0.001	1.149
Region 5 (South Coast)	< 0.001	1.121
Region 6 (Inland Desert)	0.152	1.077
License Type – Lifetime	< 0.001	1.792
Year Quarter 2	< 0.001	0.772
Year Quarter 3	< 0.05	1.038
Year Quarter 4	< 0.001	1.412
Purchase Frequency $\geq 3$	< 0.001	1.876

# Angler Attributes - Region

- Region 1 (Northern Region) was referent Region
- Odds of reporting lower in:
  - Region 3 (Bay Delta)
- Odds of reporting greater in:
  - Region 2 (North Central)
  - Region 4 (Central)
  - Region 5 (South Coast)

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# Angler Attributes - License Type

- Annual license was referent
- Lifetime license holders were 79% more likely to return

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Purchase Frequency $\geq 3$	< 0.001	1.876

# Angler Attributes- Date of Purchase

- Quarter 1 (January to March) was referent
- 23% lower in Quarter 2 (April to June)
- 3.8% higher in Quarter 3 (July to September)
- 41.2% higher in Quarter 4 (October to December)

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Purchase Frequency $\geq 3$	< 0.001	1.876

# Angler Attributes- Purchase Frequency

- Infrequent purchasing (less than 3) was referent
- Frequent purchasers were 87% more likely to return cards

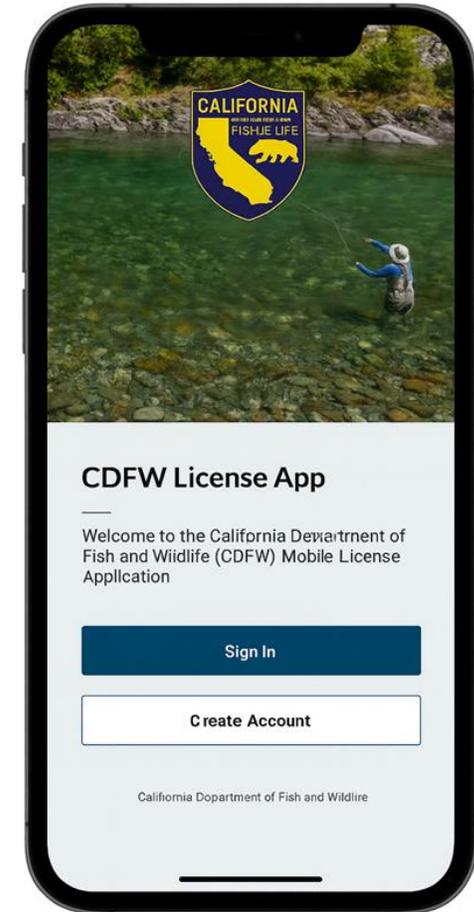
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# Key Takeaways

- Internet reporting has increased significantly
- Increased age, high purchase frequency, and lifetime license holders have a significant impact on return rate probability
- The time of year a card is purchased is a significant predictor of reporting
- Angler residence does not have a substantial effect on likelihood to report

# Recommended Next Steps

- Increase response rates by implementing penalties for nonresponse
- Developing a smartphone application to allow for easier reporting
- Follow-up surveys of nonrespondents
- Angler outreach and education



**Questions?**