



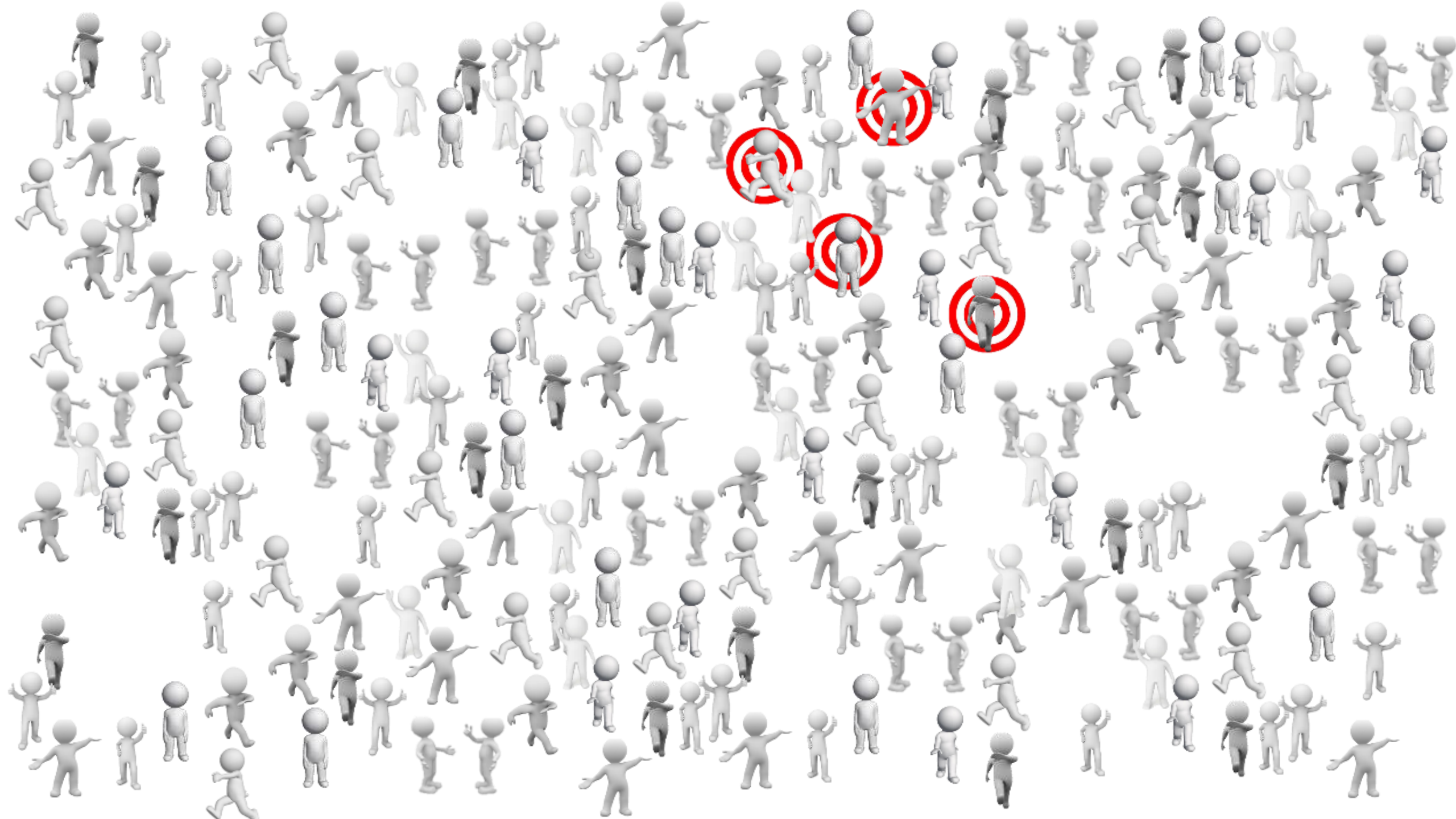
**IT'S TIME TO RENEW
YOUR FISHING LICENSE**

Larry Pape

Keith Hurley

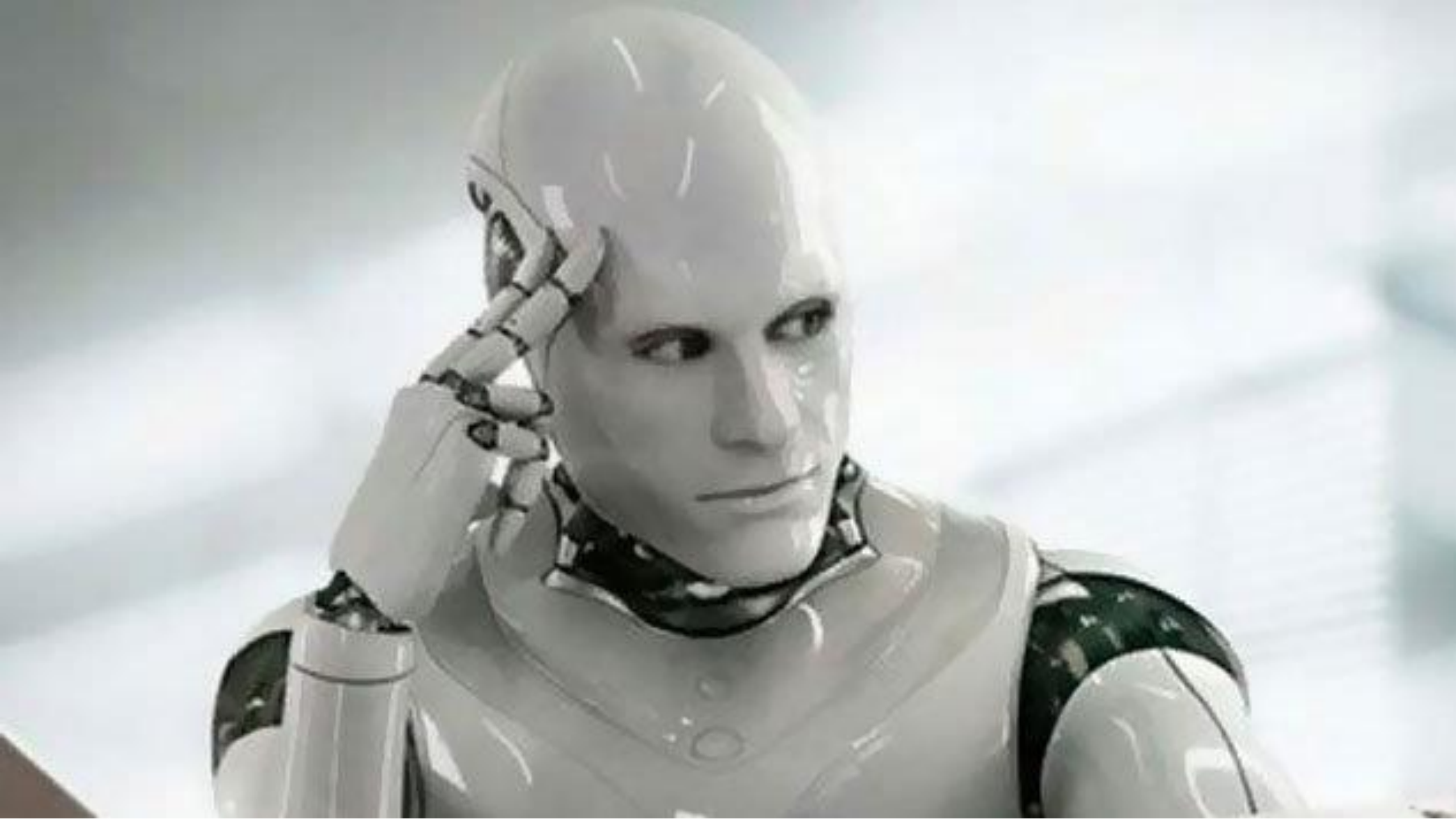
Jane Gustafson

The Intersection of Targeted Marketing and Predictive Modeling



The objective:

**Identify Anglers Likely To Lapse
Before It Happens**



DO NOT CARE:

Get Them All

As long as we get enough, we'd rather maximize accuracy

Why they lapse

Machine learning just tells the who - not the why

Basic

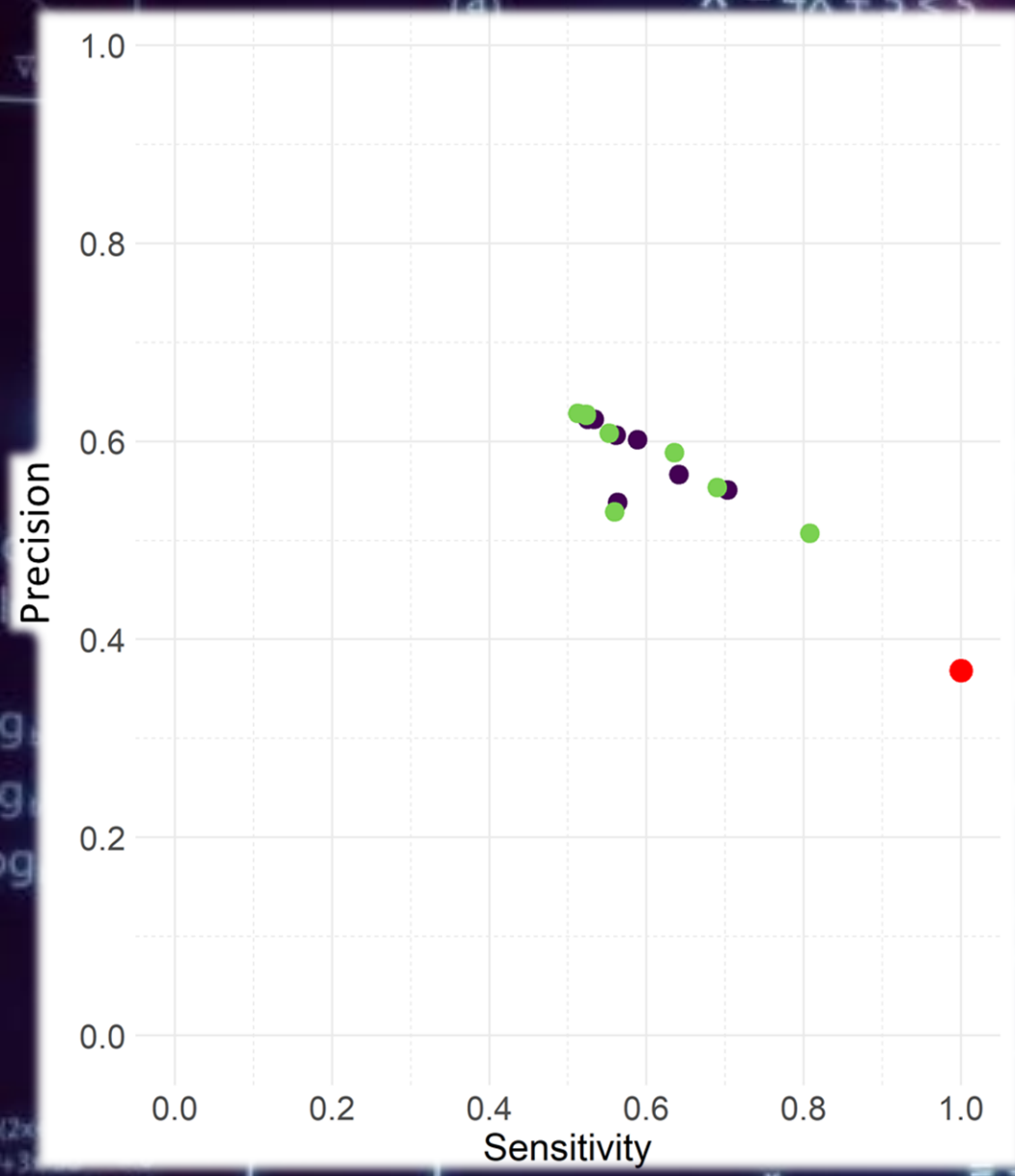
- Gender
- Age
- Residency
- Day Of Year Issued

Zipcode

- Median income
- Mean income
- Percent households
 - with retirement income
 - with children & all parents working
 - below poverty

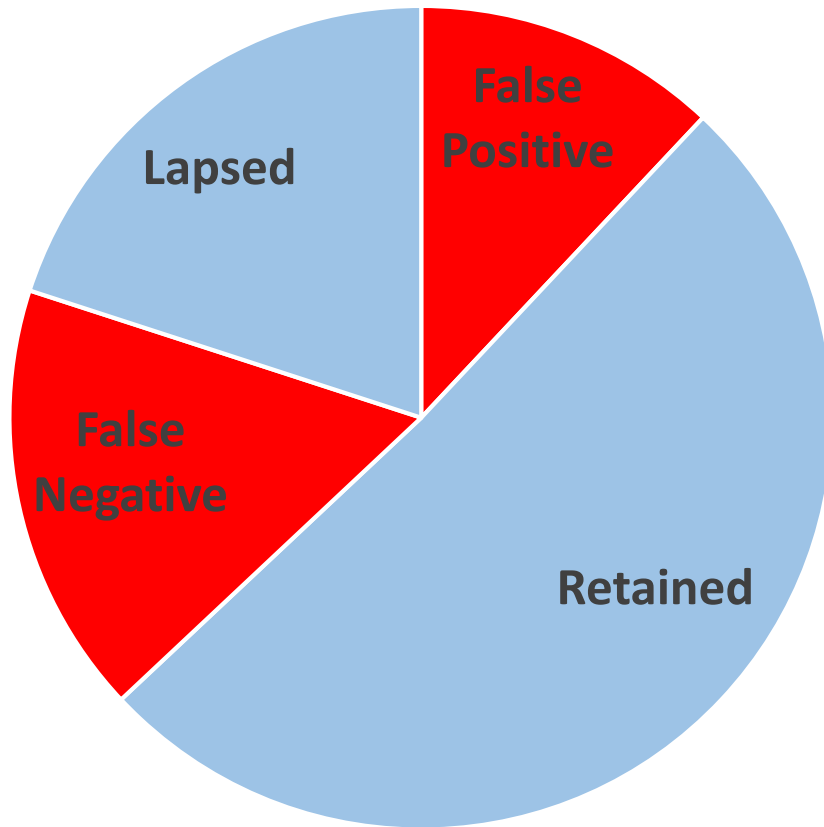
Permit History (3 or 5 years)

- Annual fishing
- Daily fishing
- Annual hunting
- Deer permit
- Spring turkey permit
- Waterfowl stamp
- Paddlefish permit



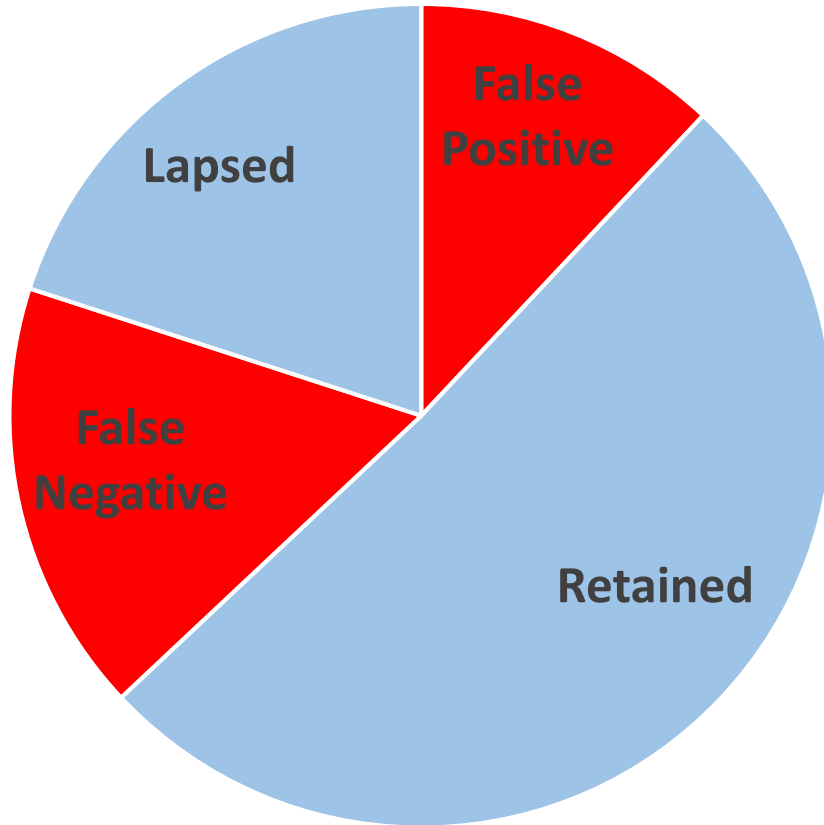
Validation Data (30%)

- 52.3% of all lapsing anglers identified
- 63.7% predicted lapses did lapse



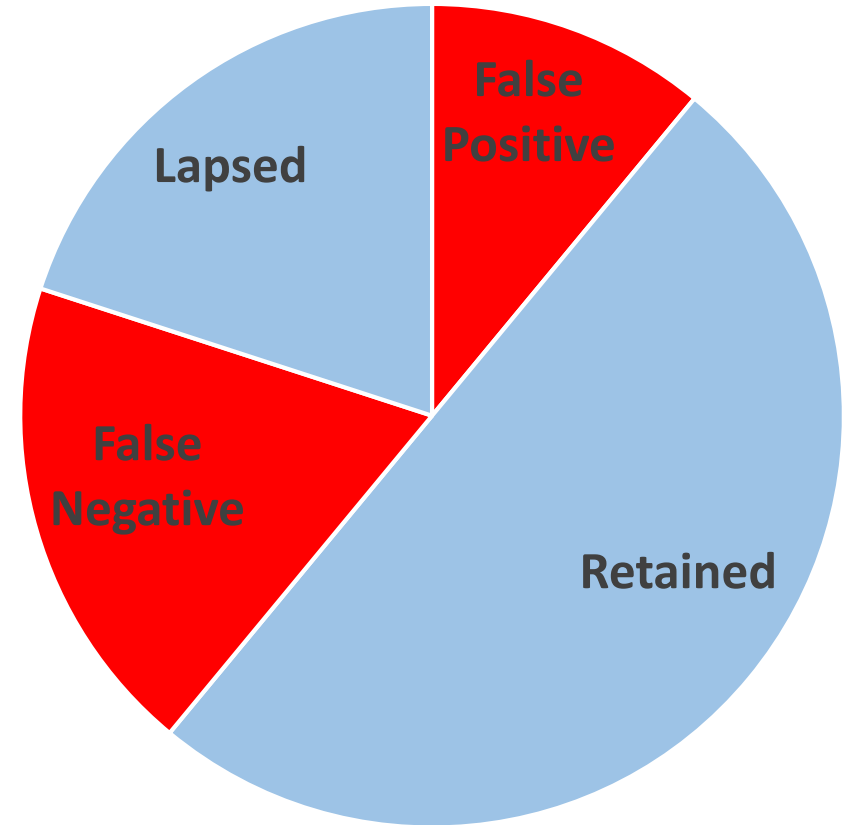
Validation Data (30%)

- 52.3% of all lapsing anglers identified
- 63.7% predicted lapses did lapse



2017 Data

- 51.0% of all lapsing anglers identified
- 64.4% predicted lapses did lapse



2017 Data - Predictions

51,582 Would Lapse In 2018

33,319 Did Lapse

18,263 Misidentified

11,272 Excluded Through Time

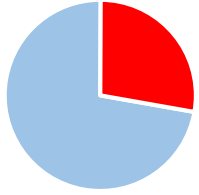
Corrected Precision = 82.6%





2019 Resident Annual Permit Holders

135,566



Predicted Retained

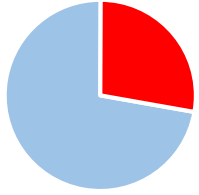
98,566

Predicted LTL

37,784

2019 Resident Annual Permit Holders

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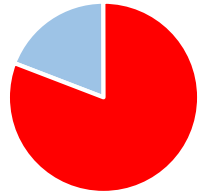


Predicted Retained

98,566

Predicted LTL

37,784



Control Group

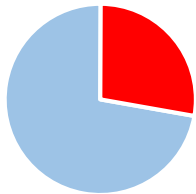
7,232

Campaign Group

30,552

2019 Resident Annual Permit Holders

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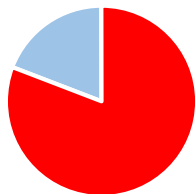


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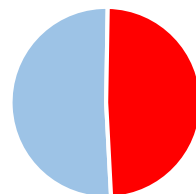


Control Group

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Campaign Group

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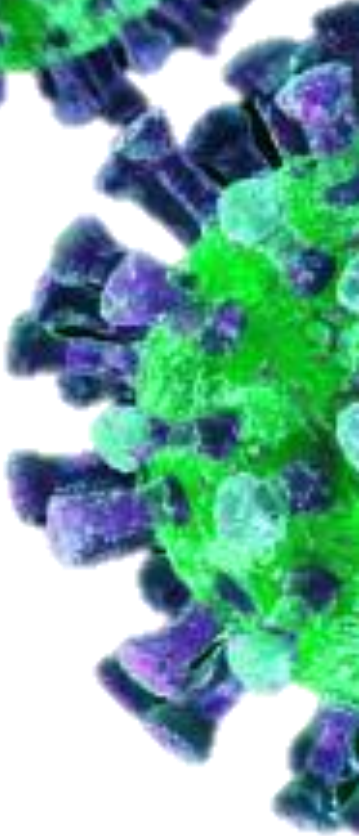
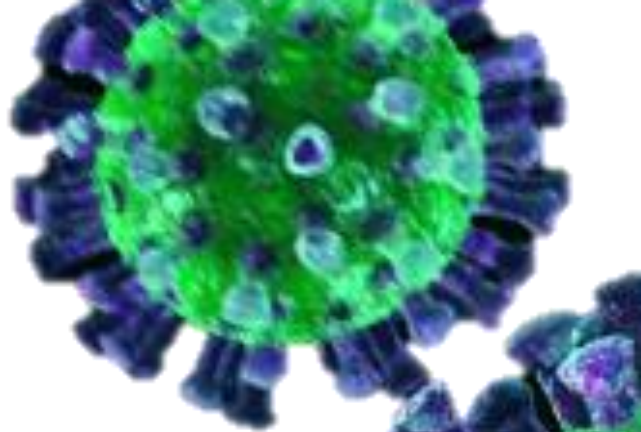

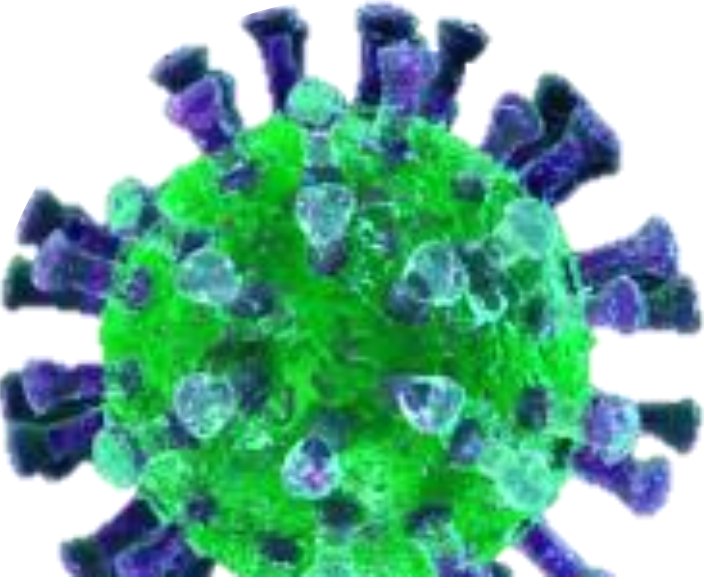


Prior Purchase

15,611

Engaged

14,941



Predictions based on human behavior
are likely to be impacted by
global pandemics!



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Targeted Marketing

Goal: Find the most cost-effective way to reach those predicted to lapse

- Remember: we don't care why they lapse; we want to maximize accuracy of predicting

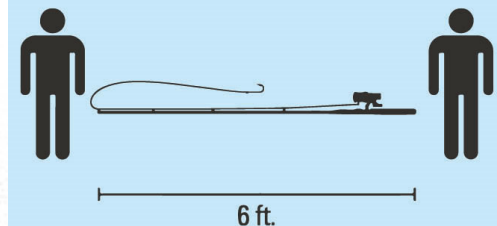
Challenge: Nebraska doesn't require email addresses

Tested two methods of communications:

- Emails
- Postcards
- 5 personalized versions of each
- Included a social distancing message on each

Social Distancing

**Keep one 6-foot fishing
pole distance between
you and others**





IT'S TIME TO RENEW YOUR FISHING LICENSE

Consider this your invitation out of the daily grind and into the fresh air.

Miles and miles of Nebraska's finest lakes, rivers and streams are out there just waiting to be experienced again. Places like Bowling Lake, Holmes Lake, Pawnee State Rec. Area and Wagon Train State Rec. Area.

Chock-full of open space and peaceful sounds, Nebraska's many waterways are the perfect backdrop for pondering life's biggest questions, or ignoring them completely, all while reeling in a few keepers.



Renew your Fishing license and start fishing today!

We encourage you to enjoy fishing while following current directed health measures, such as fishing close to home, practicing social distancing, avoiding crowds and fishing only with immediate household members. Learn more about these safety recommendations on our website.

Renew your license online at
OutdoorNebraska.org
(If you need help call 800-632-5263)

Social Distancing

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NEBRASKA
- GAME  PARKS -

PRSRT STD
U.S. POSTAGE PAID
LINCOLN, NE
PERMIT NO 199



Postcard

- Did include a 1-800 number to purchase a license over the phone


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RENEW YOUR LICENSE AND START FISHING TODAY!

We encourage you to enjoy fishing while following current directed health measures, such as fishing close to home, practicing social distancing, avoiding crowds and fishing only with immediate household members. See below to purchase your permit, find places to fish and brush up on fishing rules and regulations.

BUY YOUR PERMIT

FIND PLACES TO FISH

RULES AND REGULATIONS

Nebraska Game and Parks Commission | 2200 N. 33rd St. Lincoln, NE 68503 | 402-471-0641

Targeted Marketing

Results: Email performed better

- Email is a win-win: it costs less, is faster to implement, you get better metrics
- Personalization: can customize to fishing areas near a recipient
- Can include more information (link to Fishing Guide, where to fish, etc.)
- One click to information or permit purchase
- Can change easily (as Directed Health Measures changed)
- Social distancing image



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Targeted Marketing

Take-Aways

- Timing is important: the most lift happened early in the campaign
 - Covid delay – Project started May; 1st flight had several groups in it
 - Many people bought licenses earlier
- Coincides with our usual highest level of permit sales (Typical: most sales by June 1)
- Look at customer purchase patterns; engage them around that timeframe
 - Optimum time is just a little earlier than purchases were made previous year
- It is imperative that we get accurate email addresses for all anglers to utilize email outreach more effectively
- Other complicating factor: another promotion to lapsed anglers was done in February



Targeted Marketing

Take-Aways

- If you can BETTER predict who lapses, you can spend more on the individual transaction
- We tried postcards as our other model for communication; there are other options
- The cost on these might be more, but better targeting means it's more effective, and thus may cost less overall
- Less people (better targets) + higher cost = less overall spend
- Discounts – could it be worth offering these people discounts?
- Options like personal contacts (phone calls) could be cost effective
- Follow up contacts are also helpful



Targeted Marketing

Looking to the Future

- We will continue to refine the model
- More data + more years of purchase history helps refine the machine learning predictive model
 - Reduce the misidentification rate
- What other communication methods can we test?
- A “normal year” would be helpful
- Still need to continue working on why anglers lapse independent of this project (continue to test and refine)



Questions?

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