SCHOOL OF NATURAL RESOURCES

# Nebraska sportspersons

## NGPC

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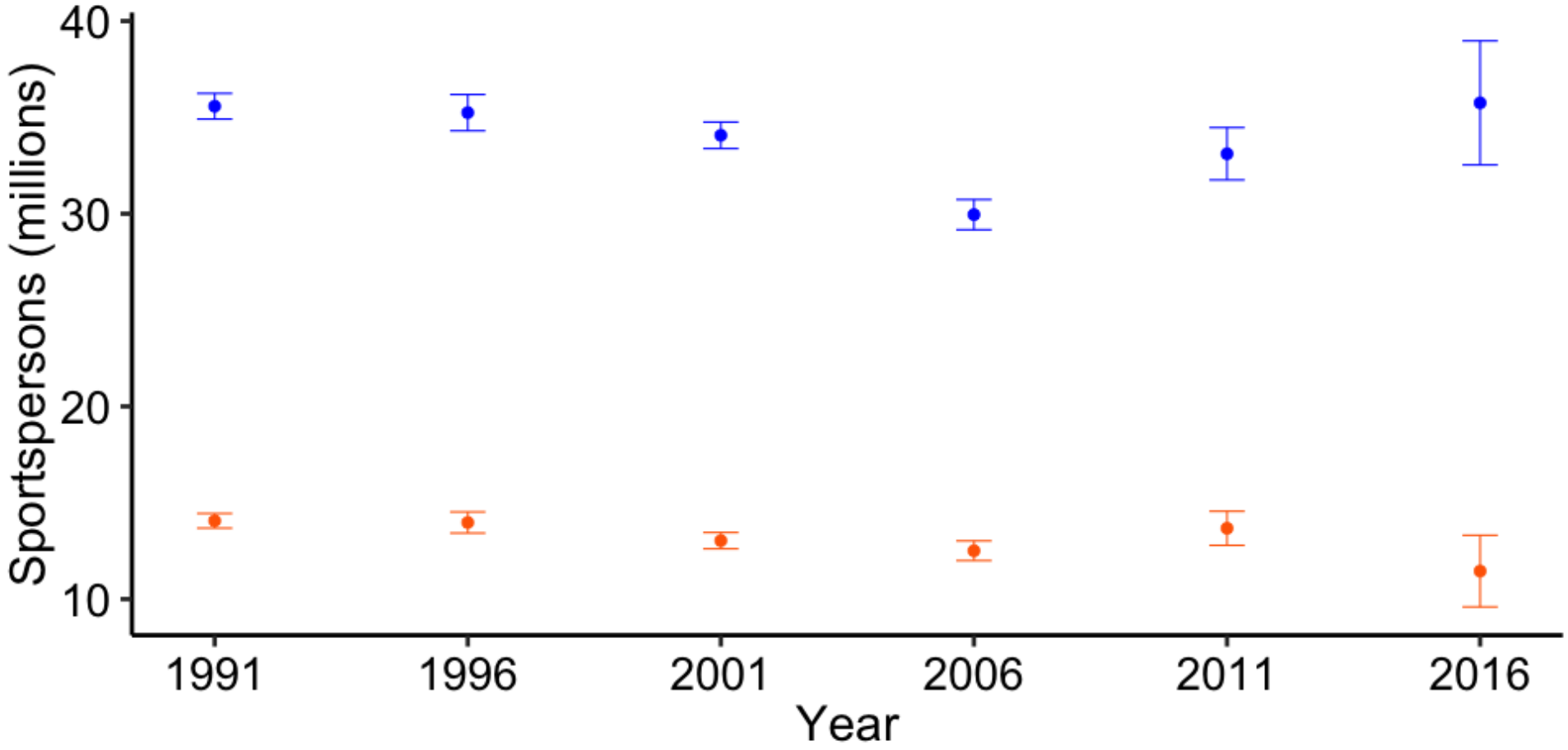
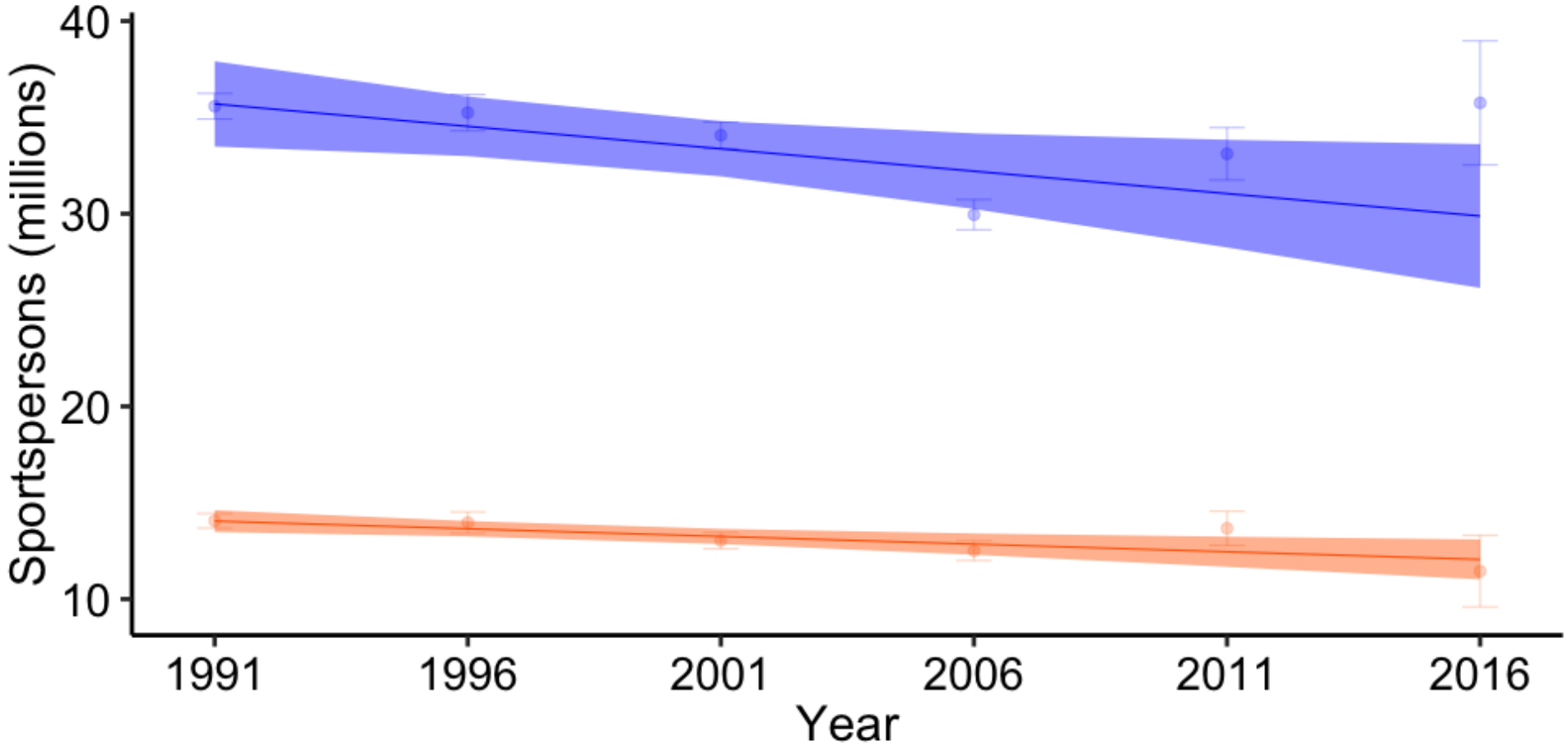
University of Nebraska-Lincoln
2018-12-03

# National FWS Survey



# National FWS Survey



# Why we should be concerned?

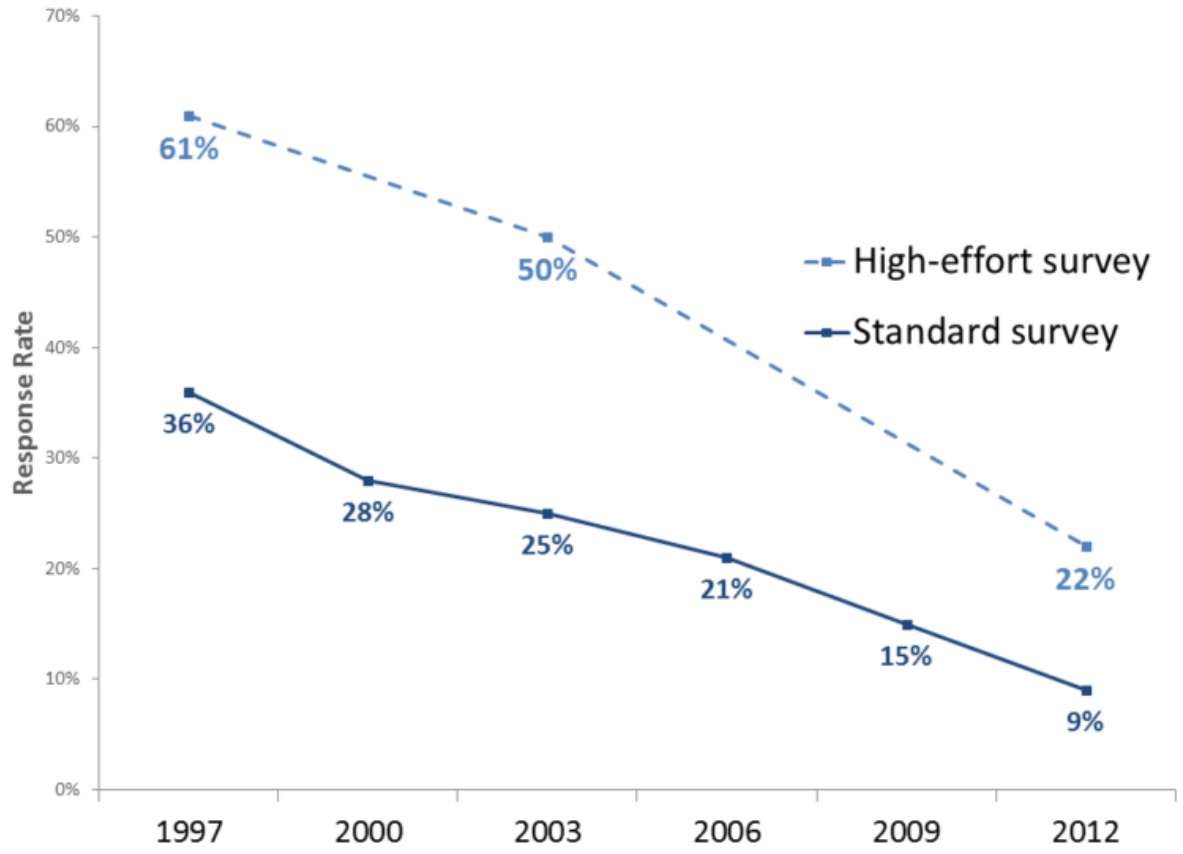
# Fundamental need to understand sportspersons

# What can we do?

- Survey! Survey! Survey!

# What can we do?

- Survey! Survey! Survey!




Source: Pew Research Center

# What can we do?

# Collecting information

# Collecting information

- Track individual customers
  - over time
  - over space
- Identify permit purchase patterns
- Up-to-date information
- Lessen burden from surveys

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# UNL Sportsperson database project

## Project objectives:

1. Compile and merge available data sets of Nebraska sportspersons and park users.
2. Identify and assess associations and key demographic factors among license holders.
3. Analyze data sets to identify key differences and movements among sportsperson groups.
4. Develop decision-support tools that give insight into how fish and wildlife managers can direct management and recruitment and retention efforts to maximize participation in Nebraska.

# Limitations of databases

- Limited by the information we collect
  - don't collect a lot of demographic information (limited to gender, age, location)
- Quality of databases
  - a **LOT** of bad email addresses
    - 40-60% provide email
    - 10-20% of those are bad email addresses
  - only as good as our unique customer ids
- Don't tell us the *WHYS*

# What can we learn about Nebraska sportspersons from our permit database?

# Nebraska Sportspersons

## Deer permits

Female permit holders

11.2 %

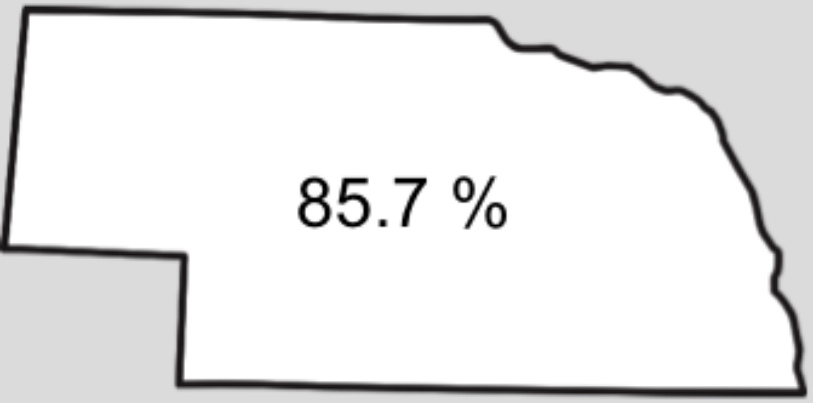
**95.7 K**

**Permit holders**

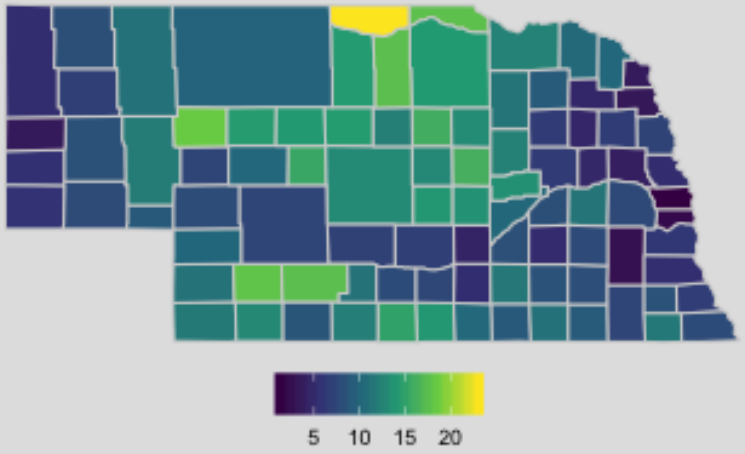
Change from 2016

2.7%

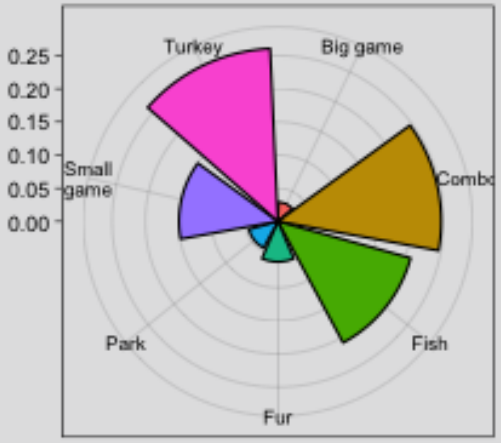
Resident permit holders




Permit holders per 100 residents




Other permits purchased



# Nebraska Sportspersons

## Fish Annual+ permits

Female permit holders

28.6 %

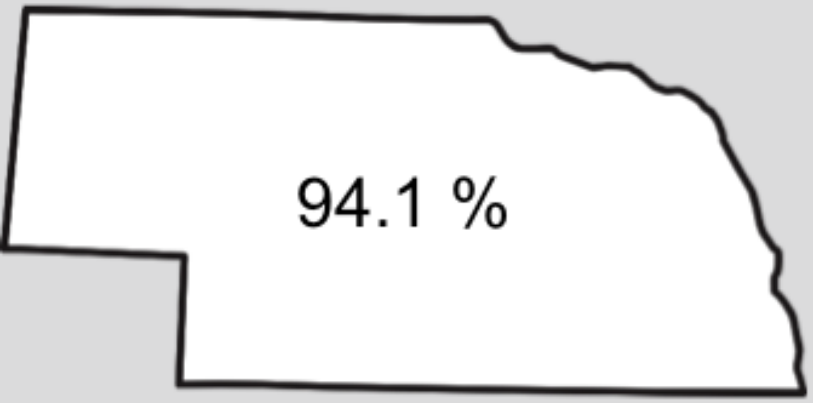
# 122.3 K

**Permit holders**

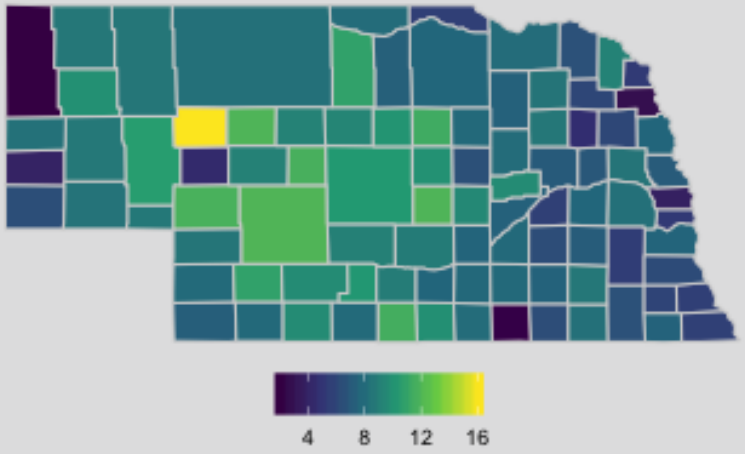
Change from 2016

3.3%

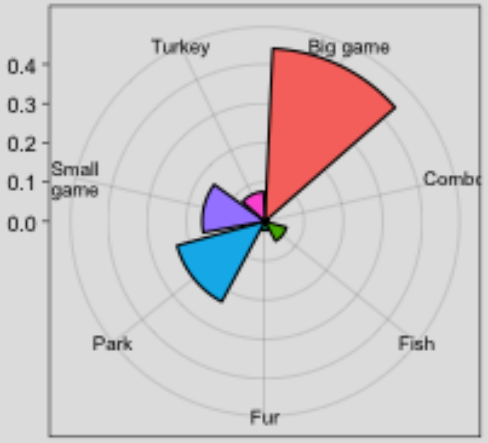
Resident permit holders




Permit holders per 100 residents




Other permits purchased



# Nebraska Sportspersons

## Fish Daily permits

Female permit holders

26.6 %

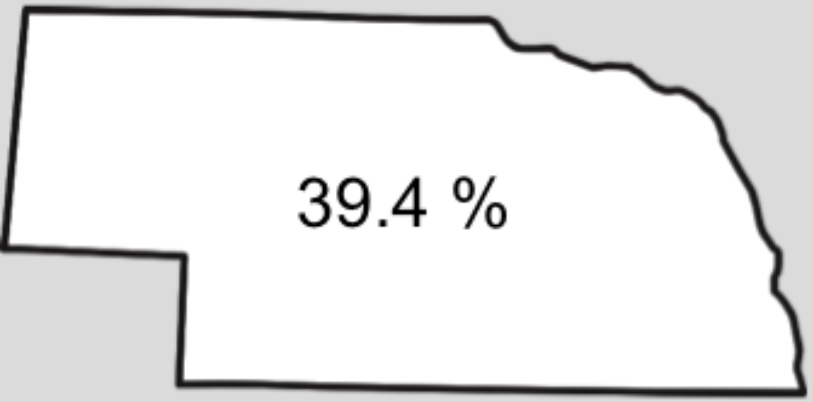
**36.9 K**

**Permit holders**

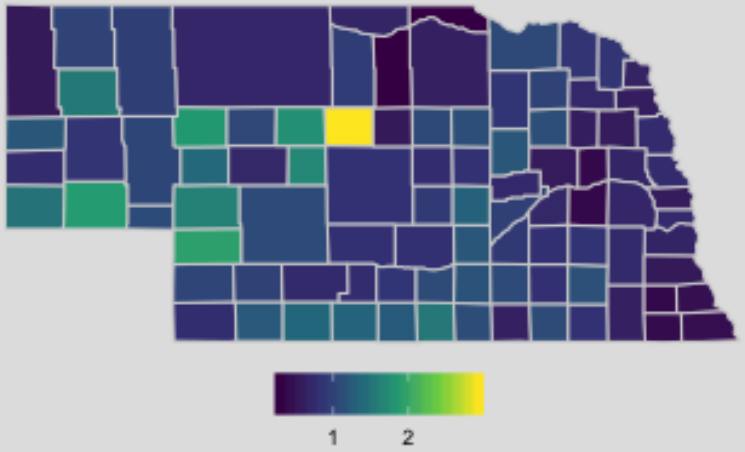
Change from 2016

2.9%

Resident permit holders




Permit holders per 100 residents




Other permits purchased

# Nebraska Sportspersons

## Hunt Fish Combo permits

Female permit holders

10.7 %

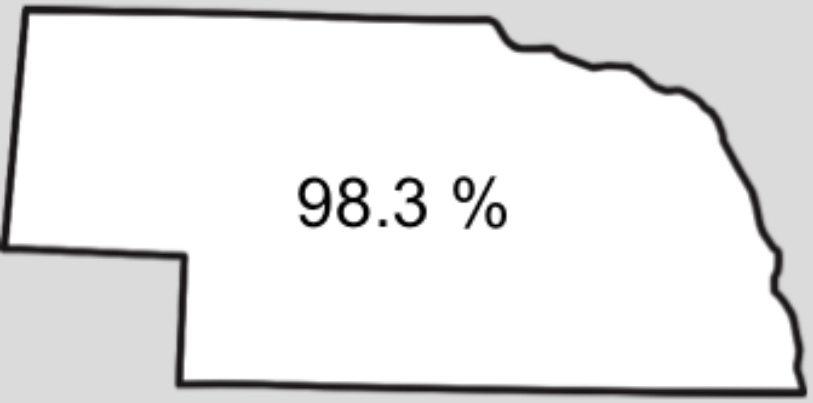
**50.2 K**

**Permit holders**

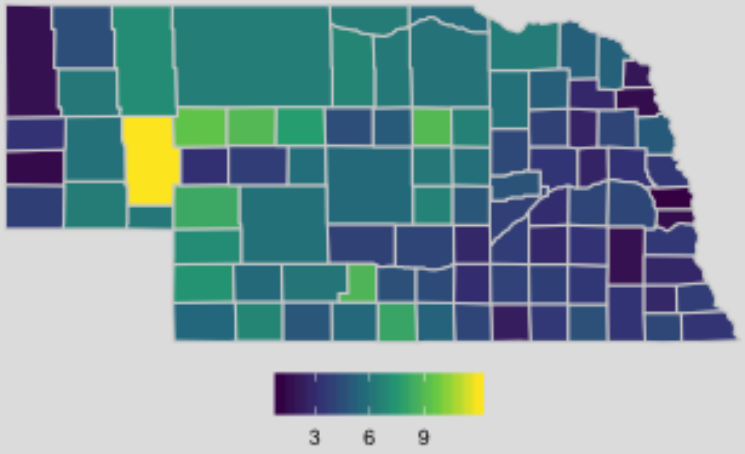
Change from 2016

4.4%

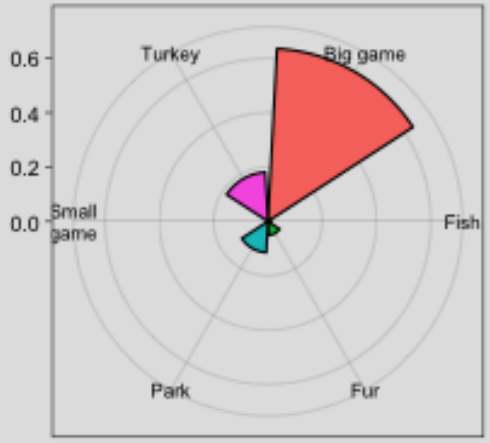
Resident permit holders




Permit holders per 100 residents




Other permits purchased



# Nebraska Sportspersons

## Hunt permits

Female permit holders

5.2 %

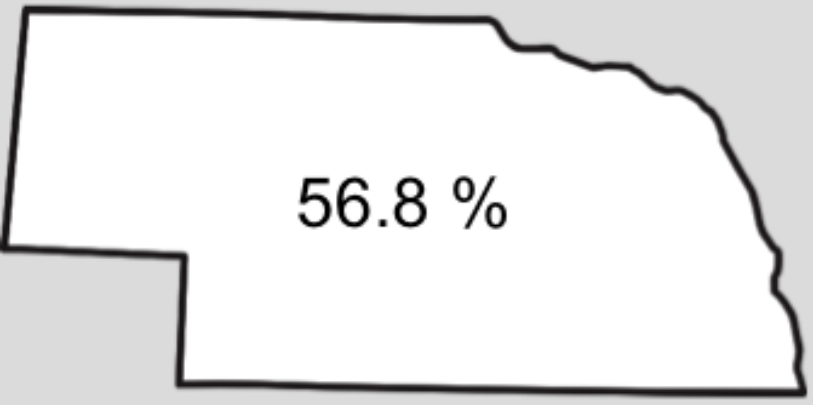
**38.7 K**

**Permit holders**

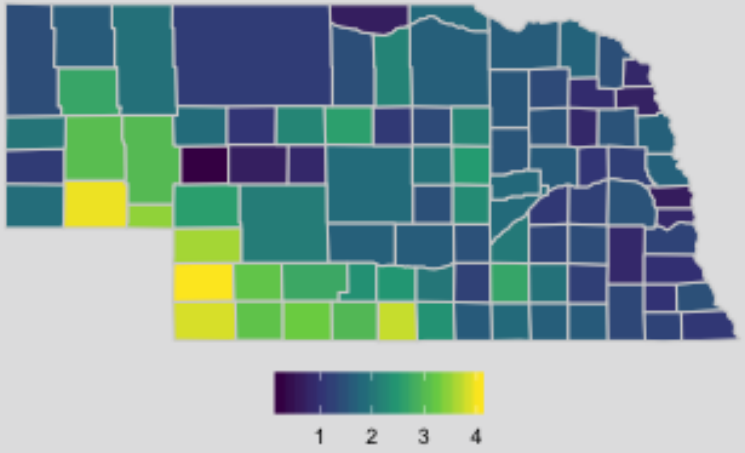
Change from 2016

4.4%

Resident permit holders




Permit holders per 100 residents




Other permits purchased

# Nebraska Sportspersons

## Turkey permits

Female permit holders

7.5 %

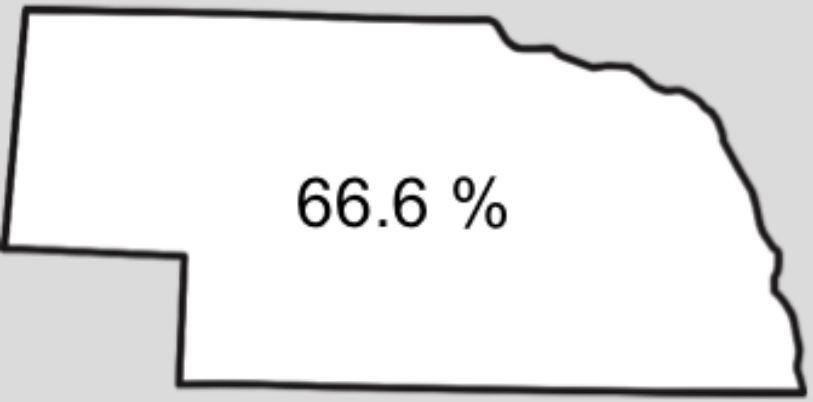
**30 K**

**Permit holders**

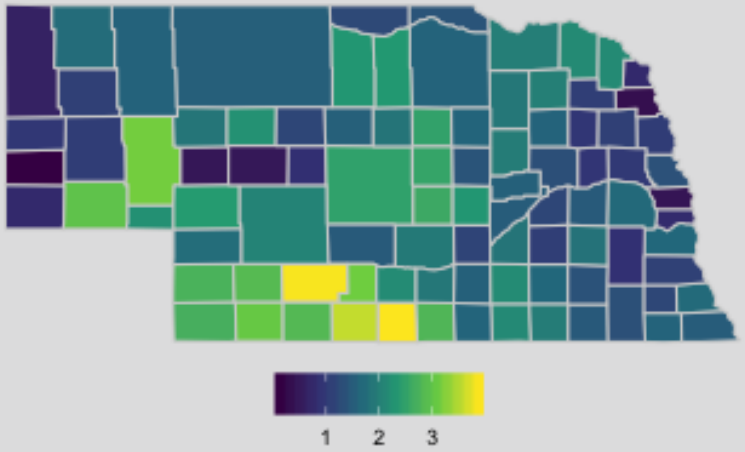
Change from 2016

5.2%

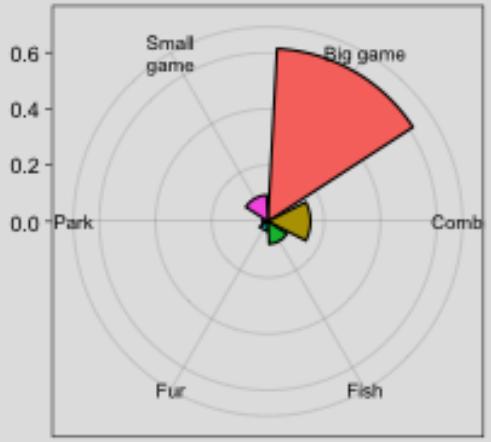
Resident permit holders




Permit holders per 100 residents




Other permits purchased



# Nebraska Sportspersons

## Fur Harvest permits

Female permit holders

2.2 %

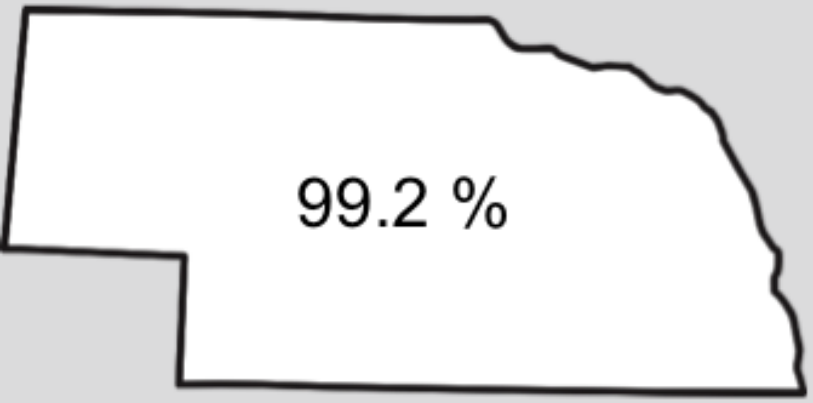
**6.3 K**

**Permit holders**

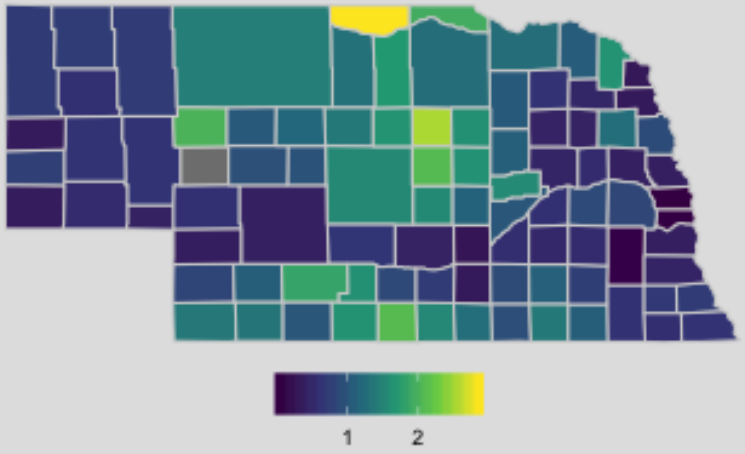
Change from 2016

5.1%

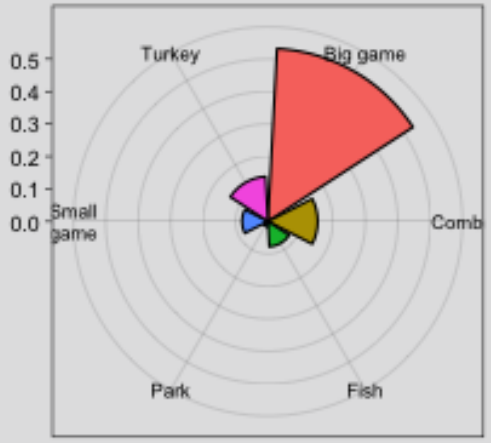
Resident permit holders




Permit holders per 100 residents




Other permits purchased



# Nebraska Sportspersons

## Park permits

Female permit holders

3.4 %

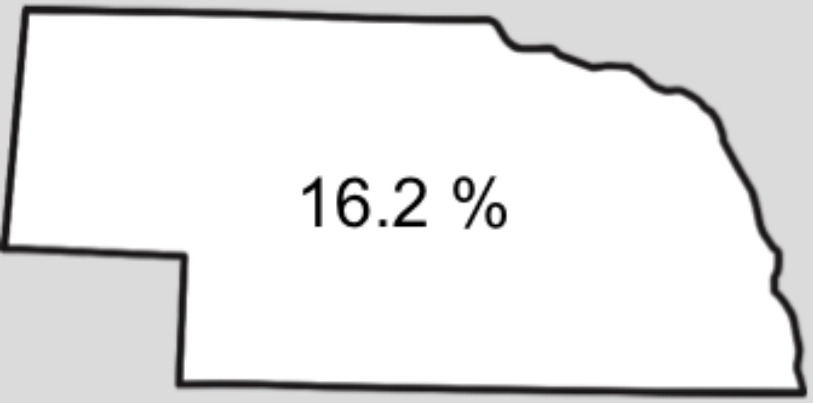
**108.5 K**

**Permit holders**

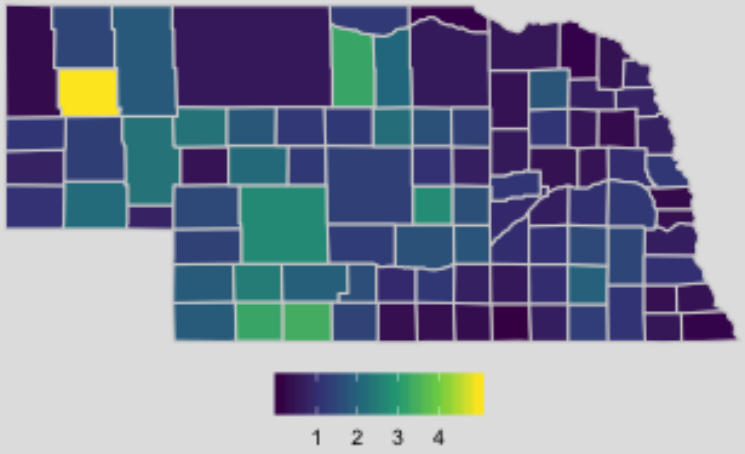
Change from 2016

10.9%

Resident permit holders




Permit holders per 100 residents

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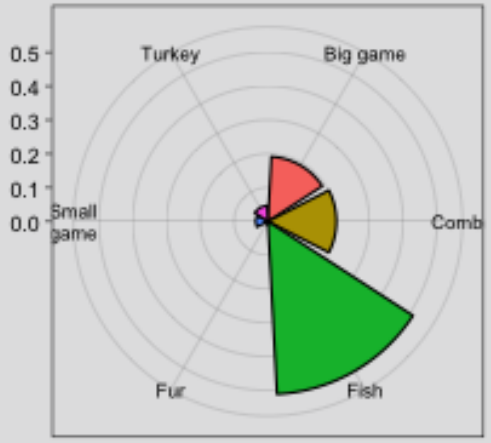
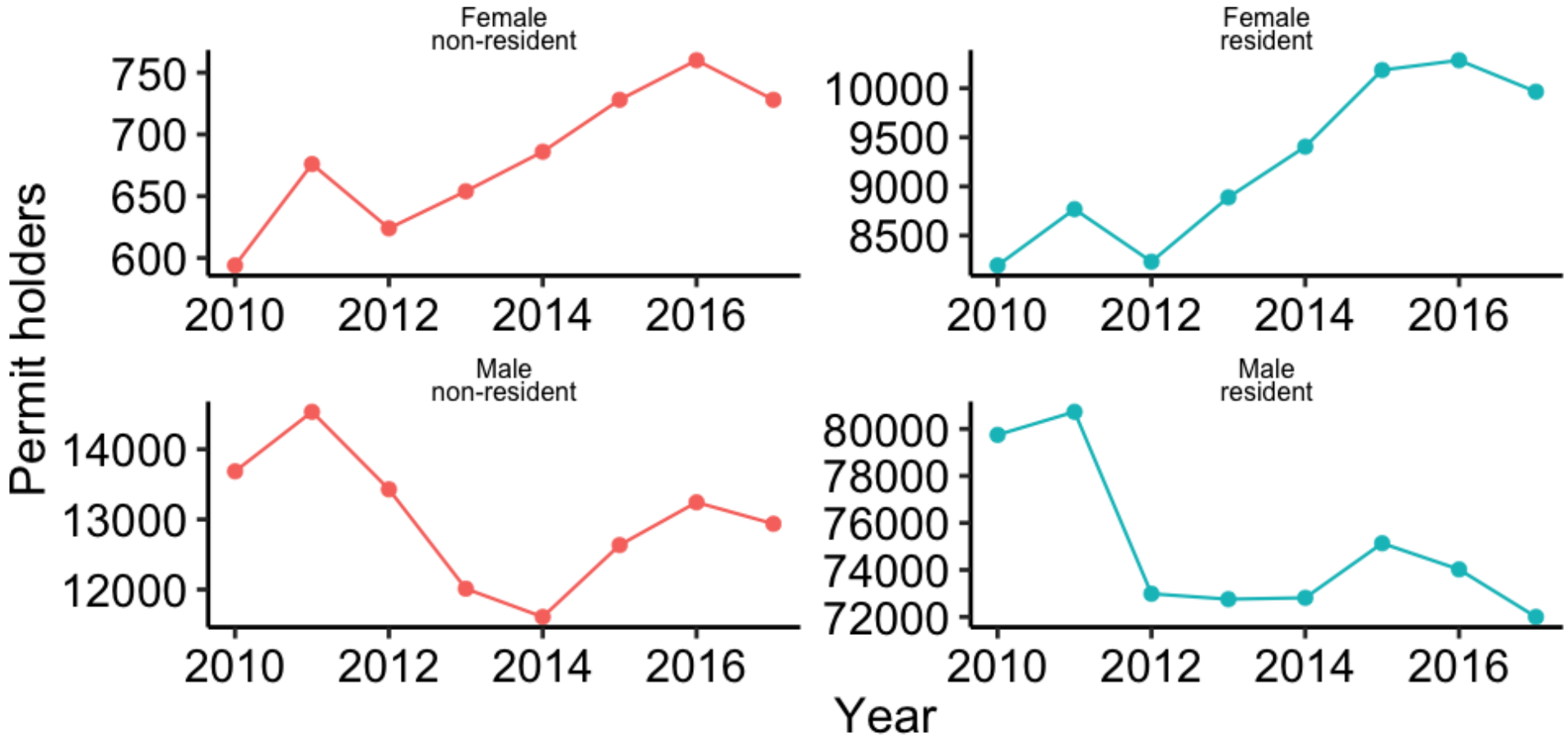


# How are these permits changing over time?

# Deer permits

# Deer permits



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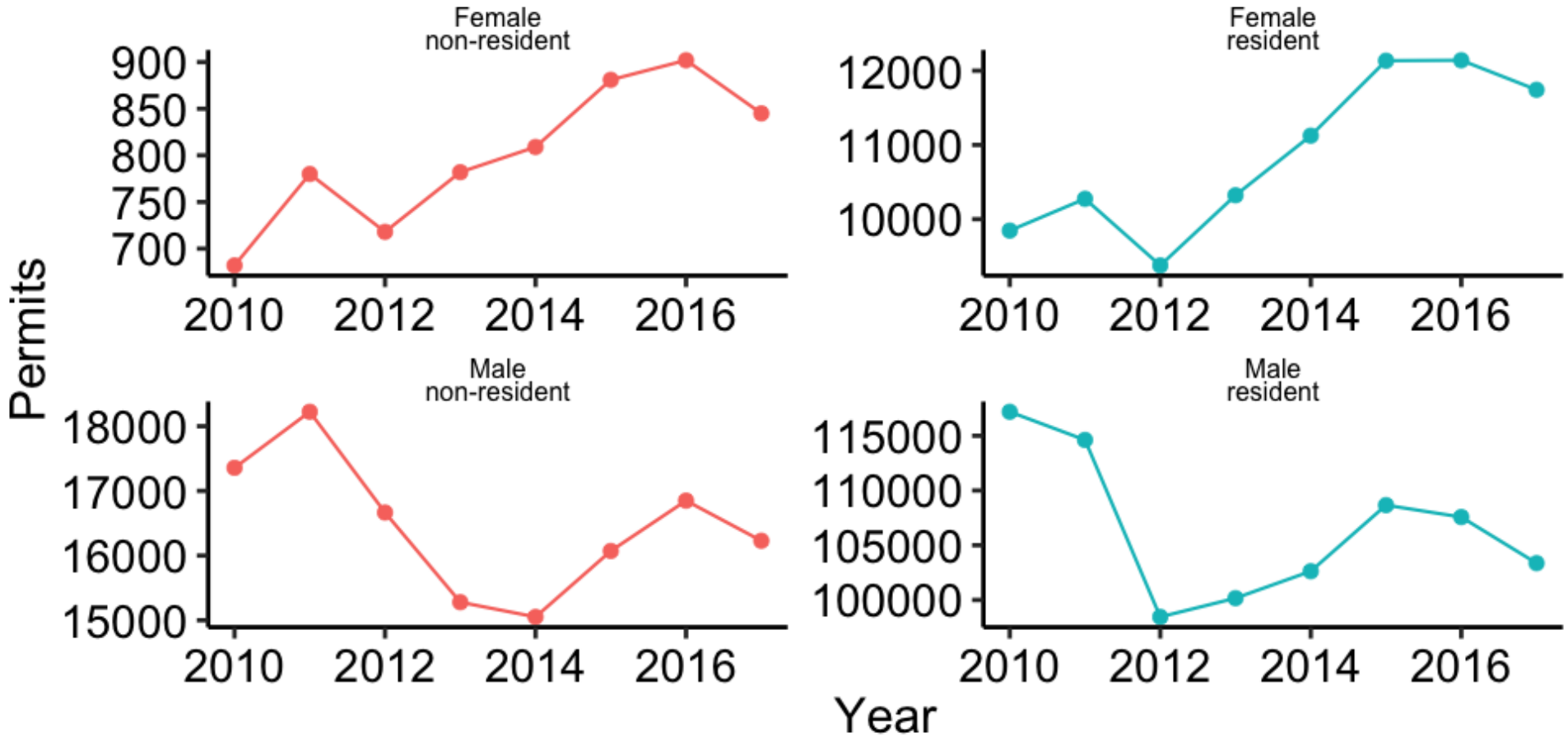

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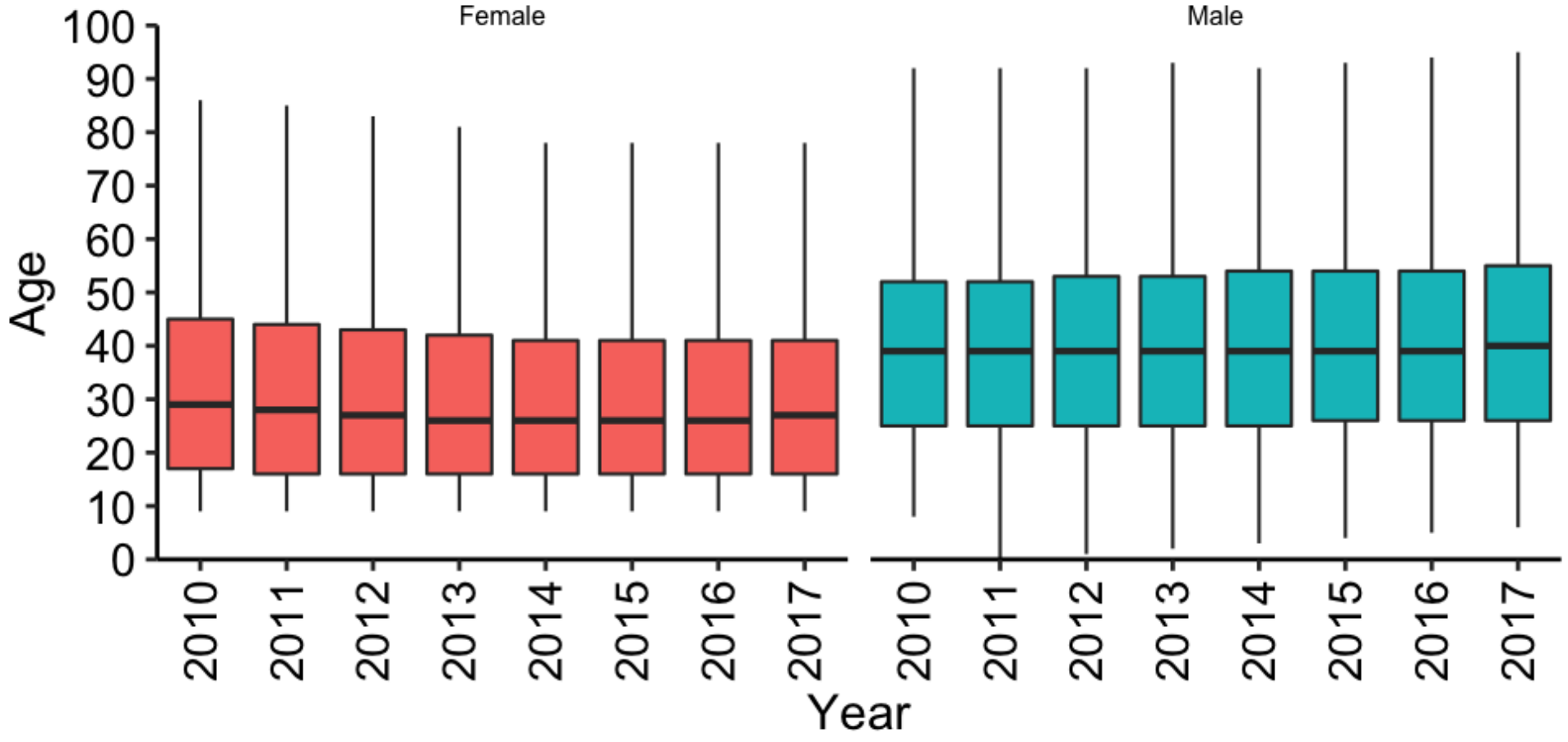
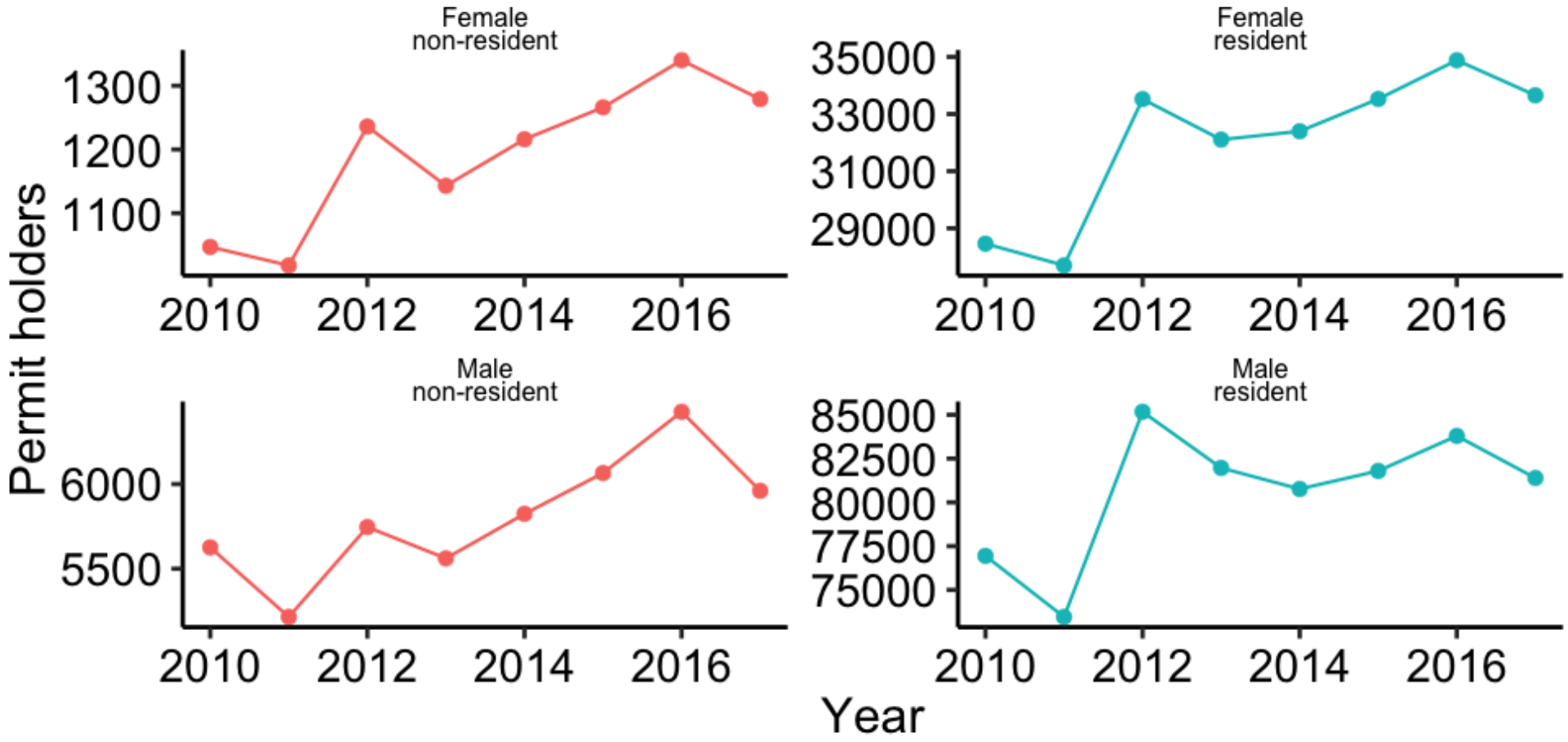


# Fish (Annual +) permits

# Fish Annual+ permits



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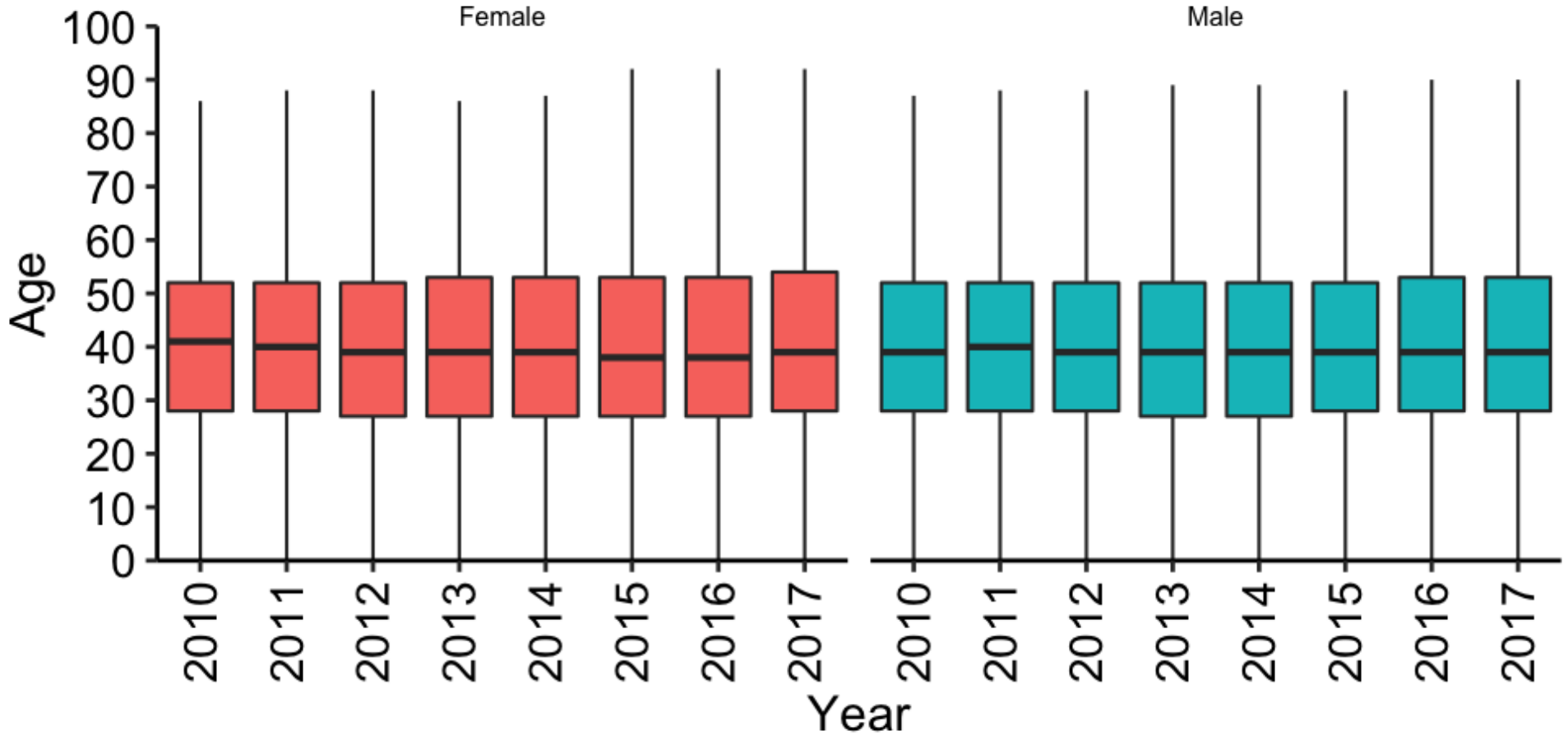

# Fish (Daily) permits

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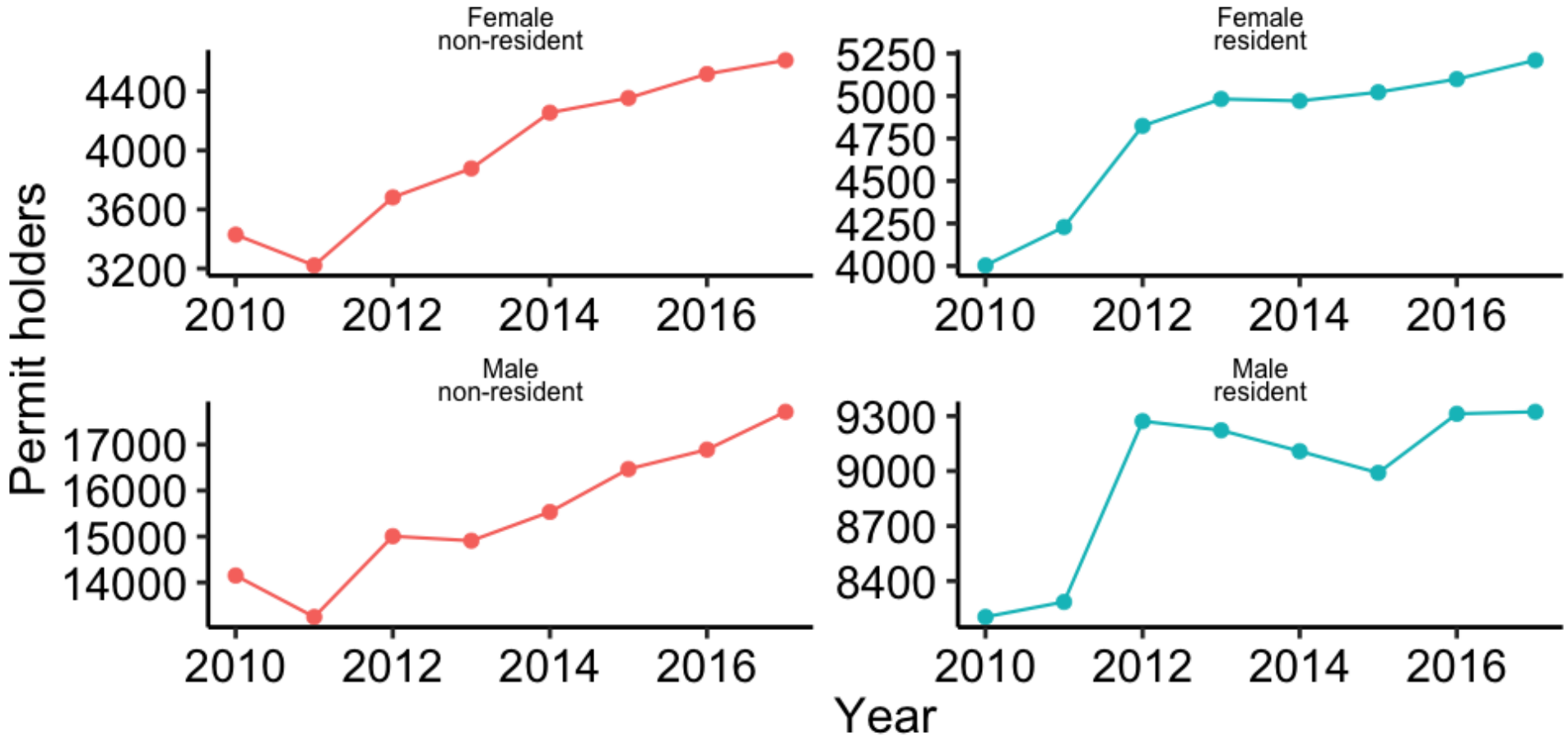

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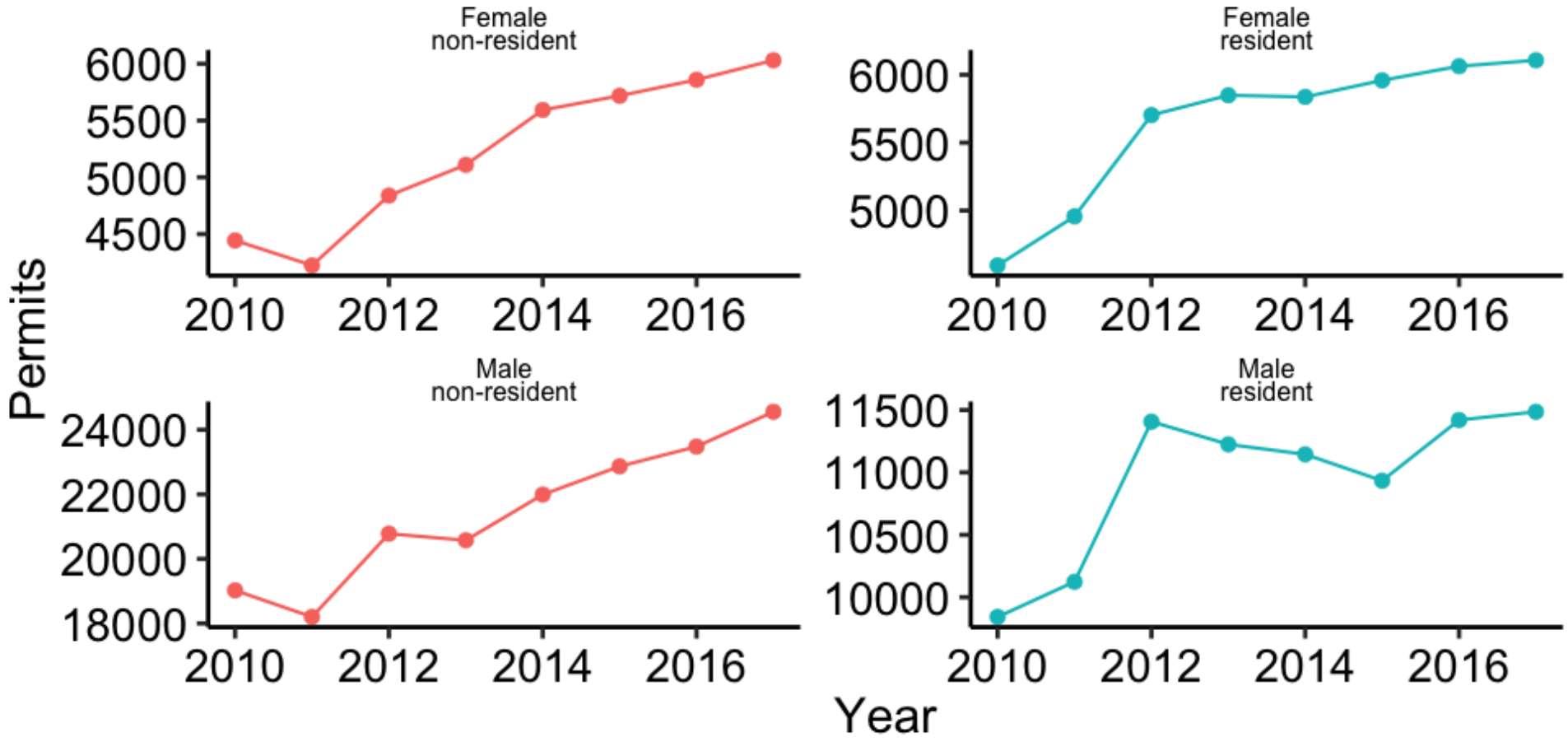

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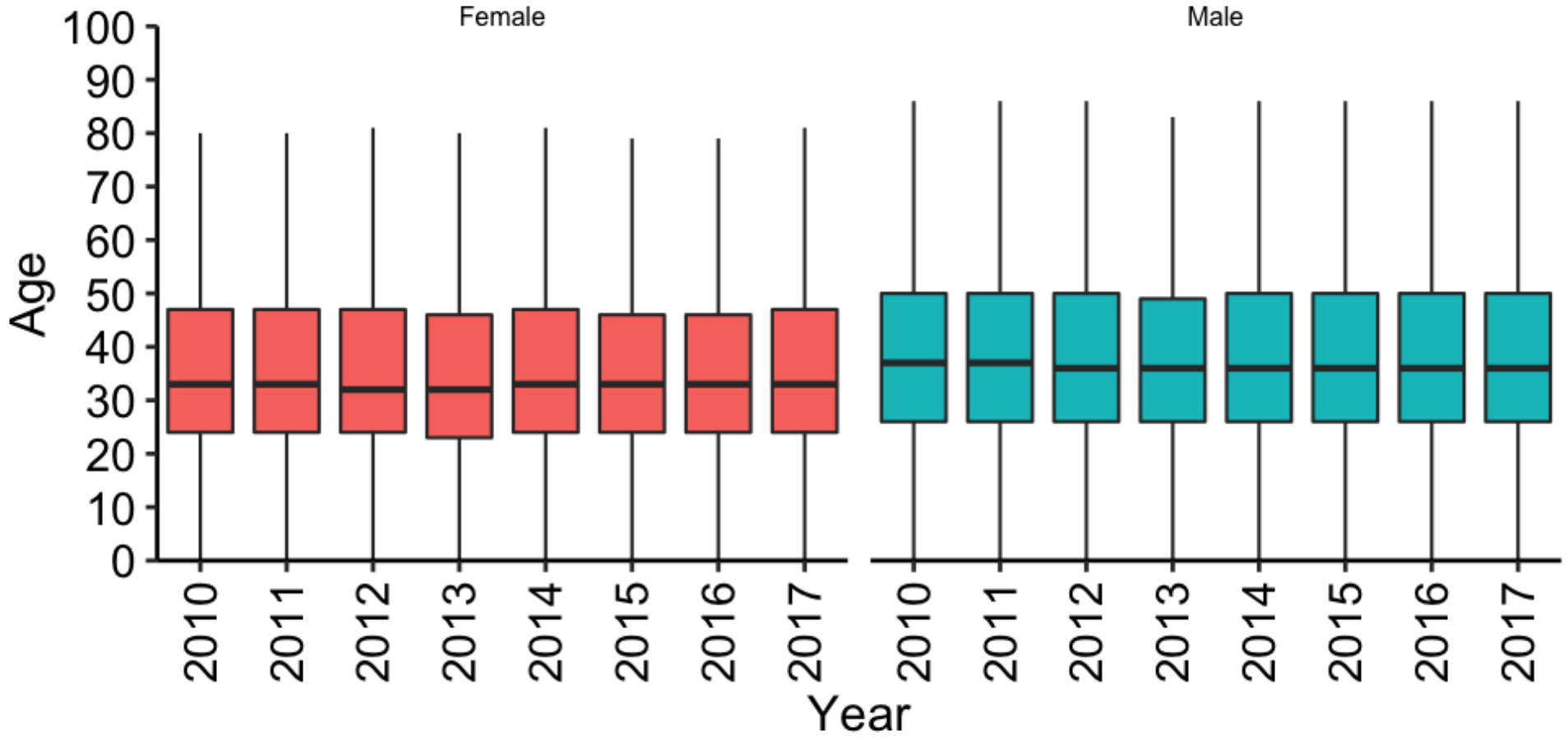

# Fish Hunt Combination permits

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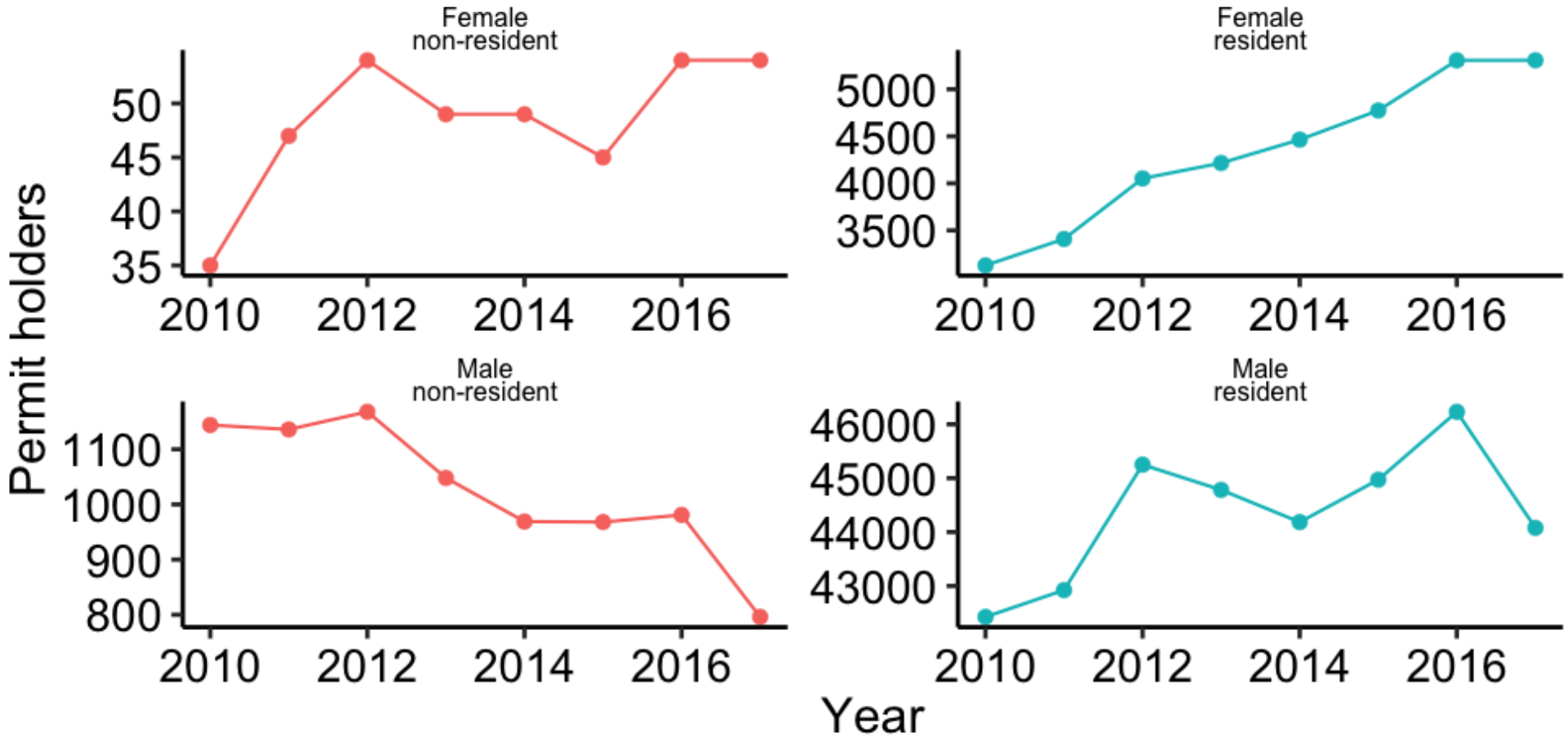

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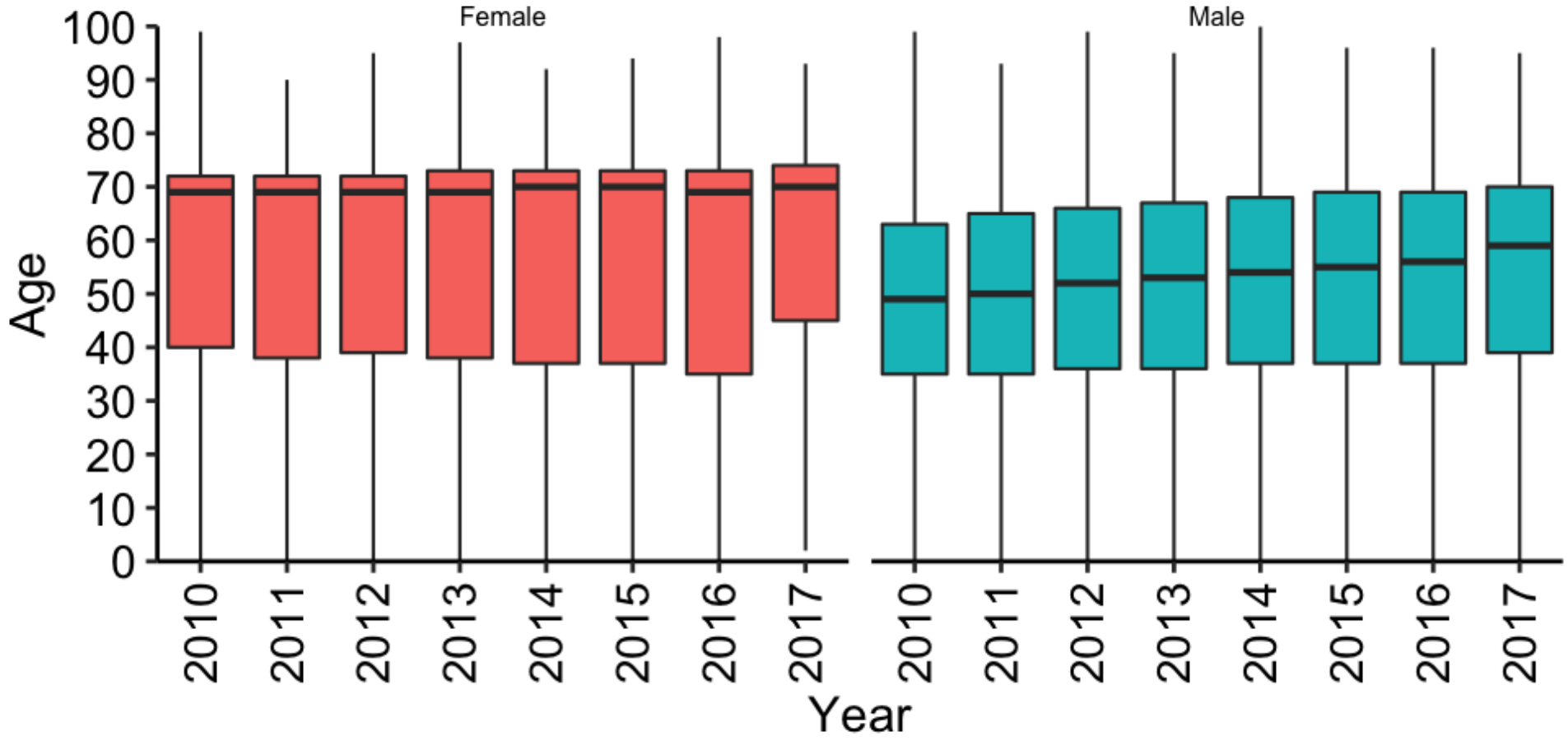
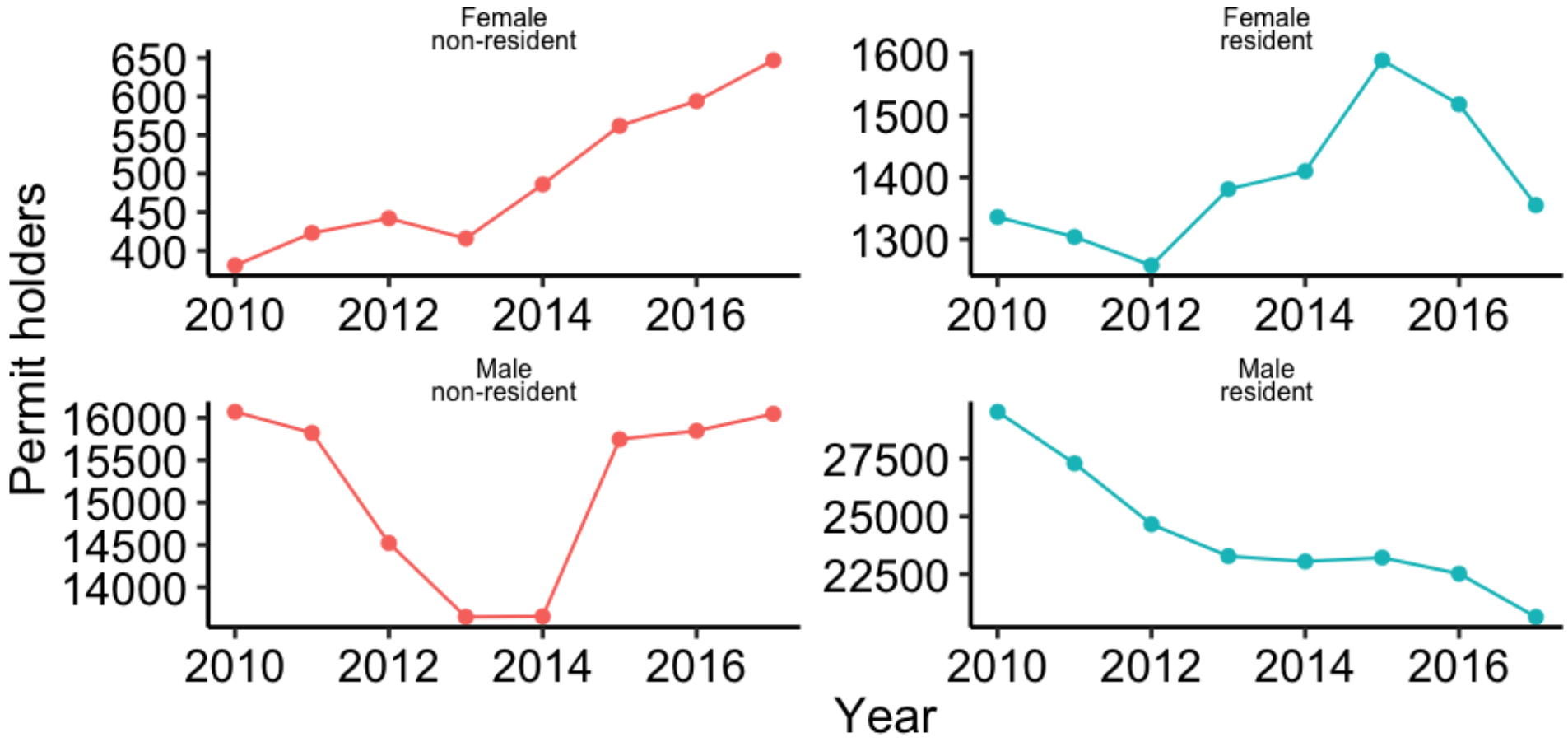


# Small Game (Hunt) permits

# Small Game permits



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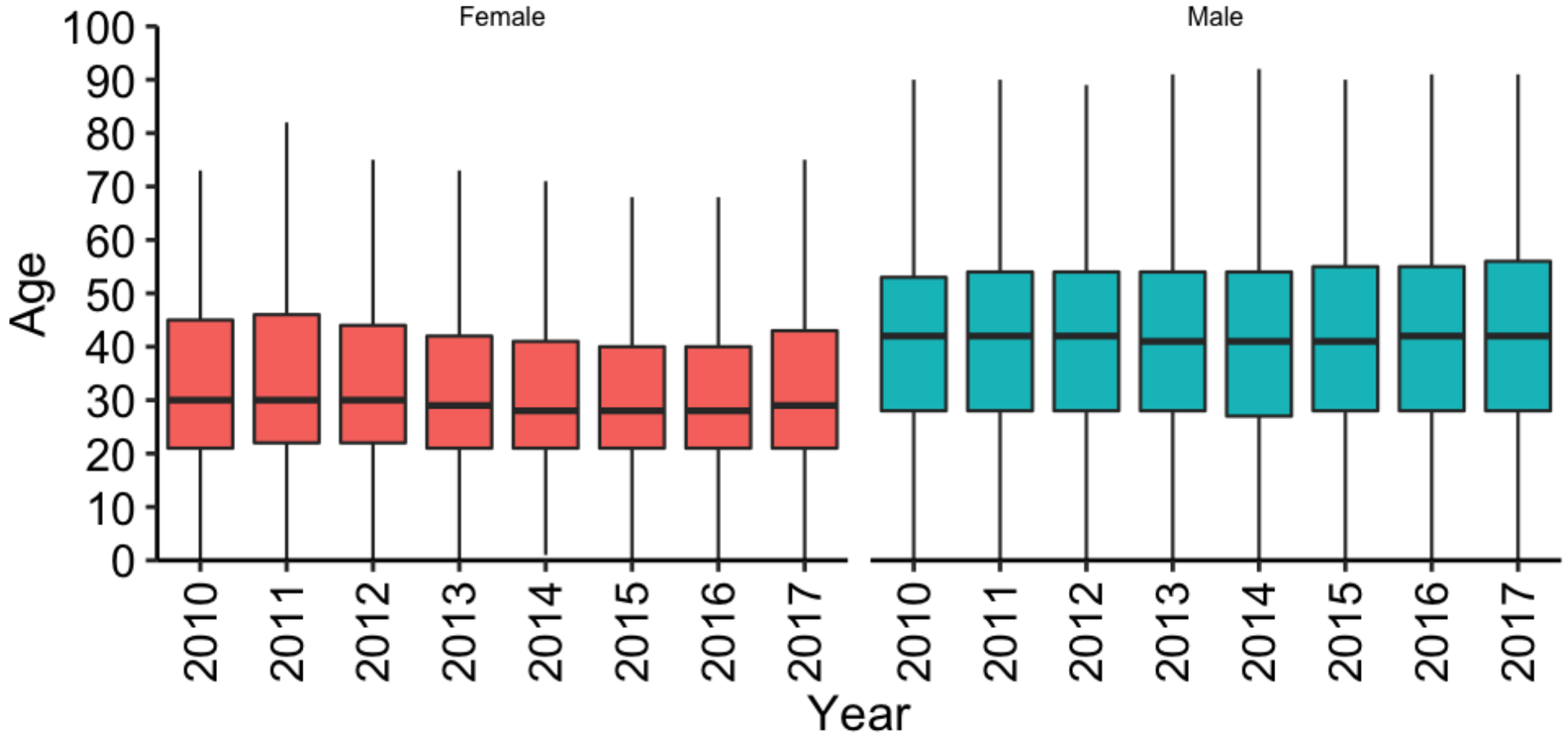

# Turkey (spring and fall) permits

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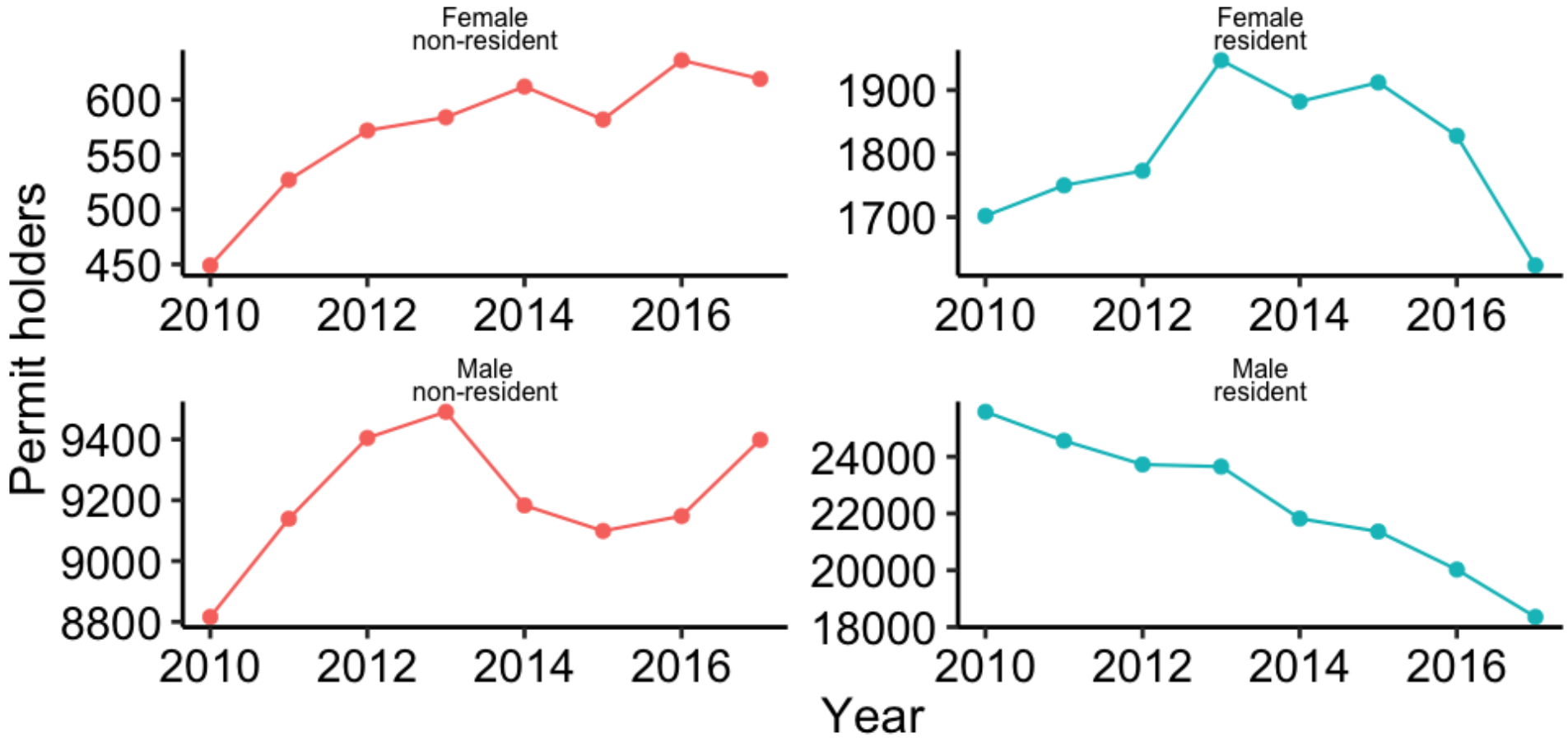

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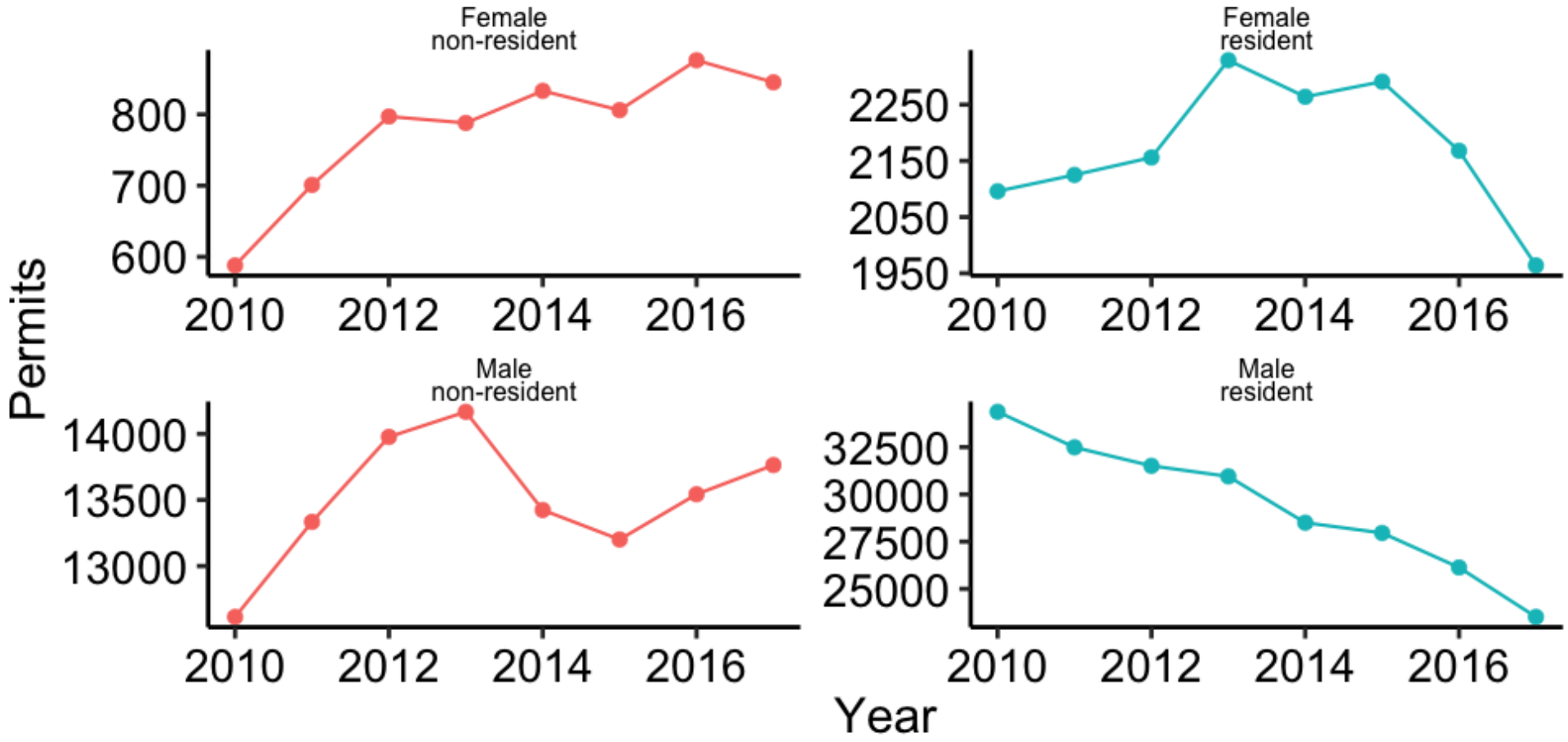

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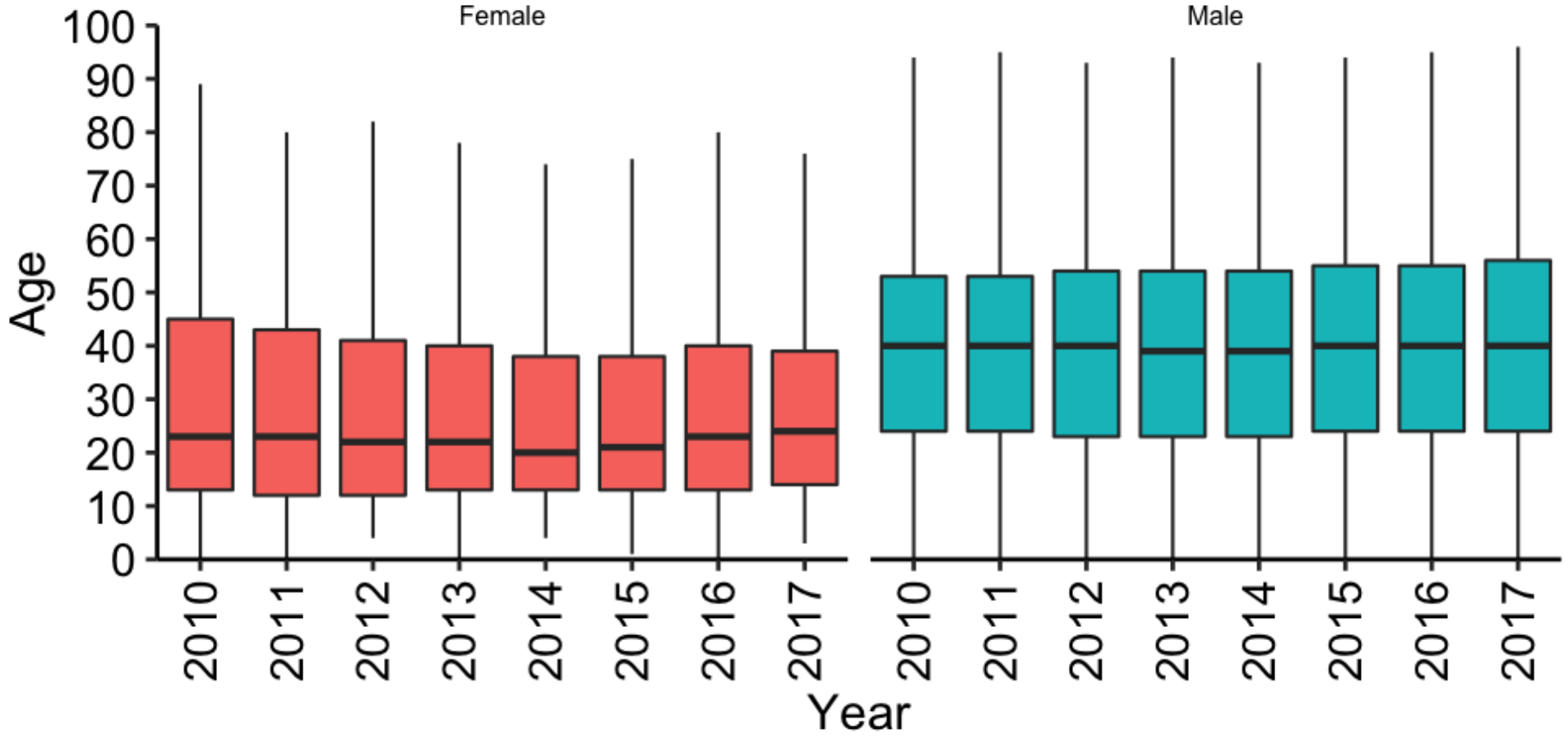

# Fur Harvest permits

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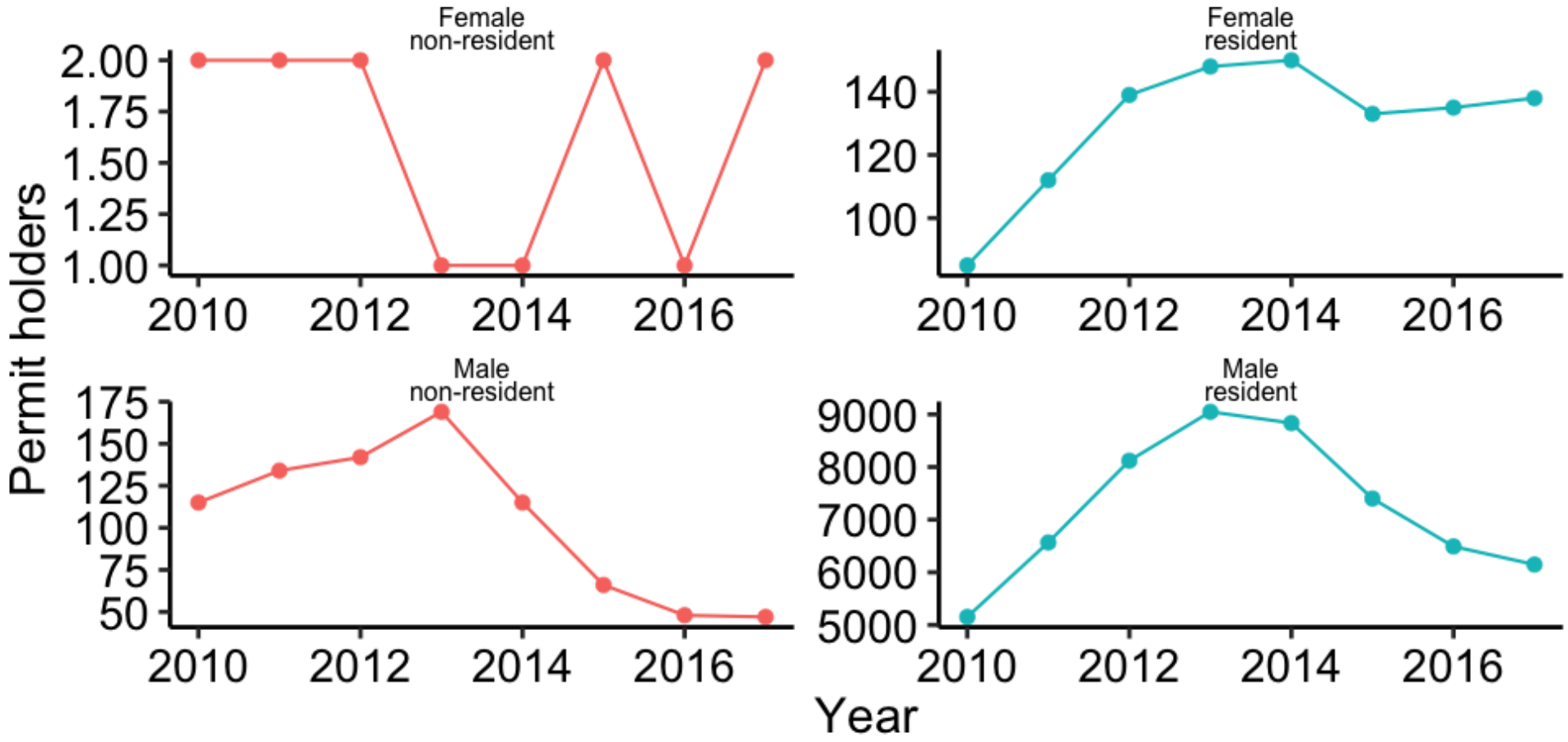

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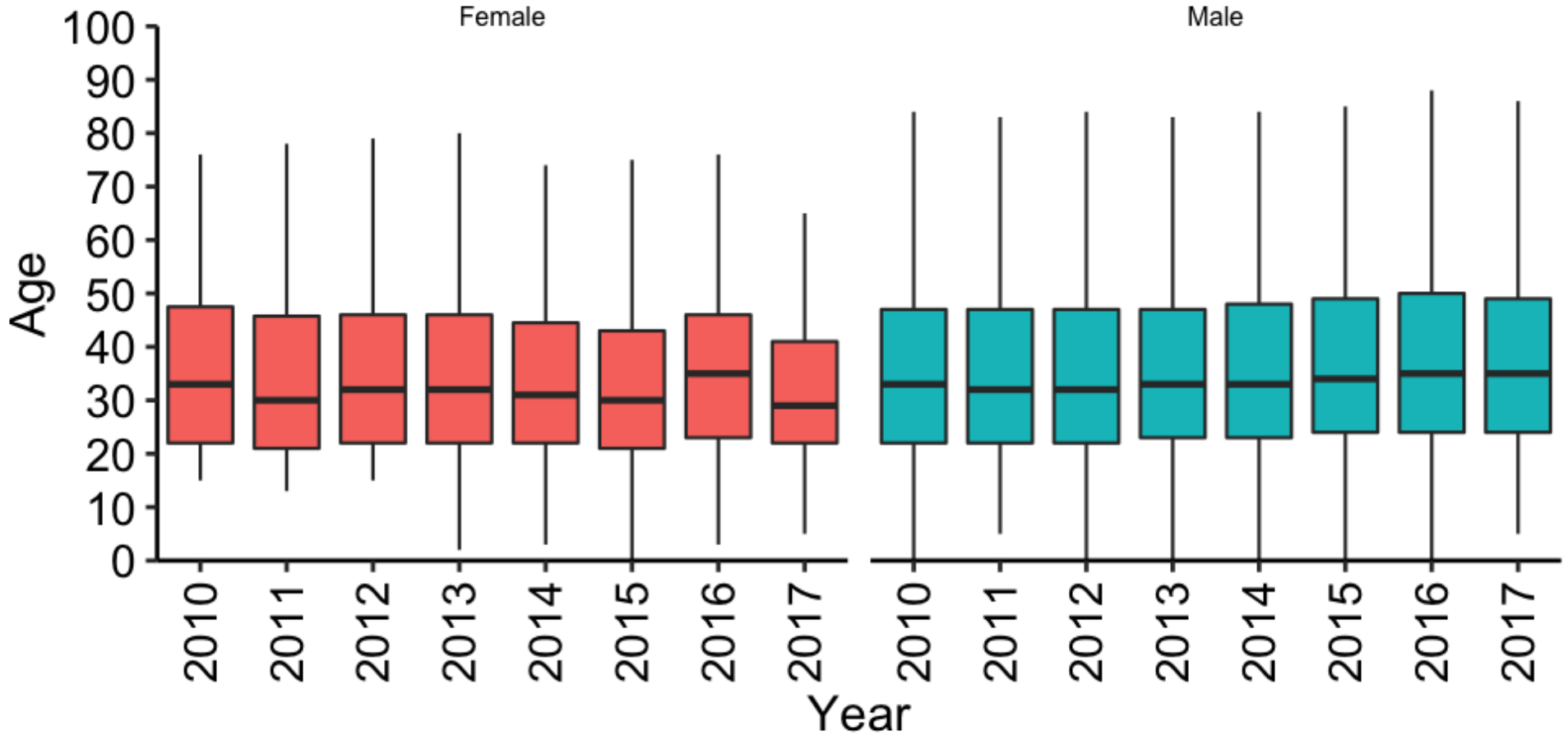

# Online Park permits

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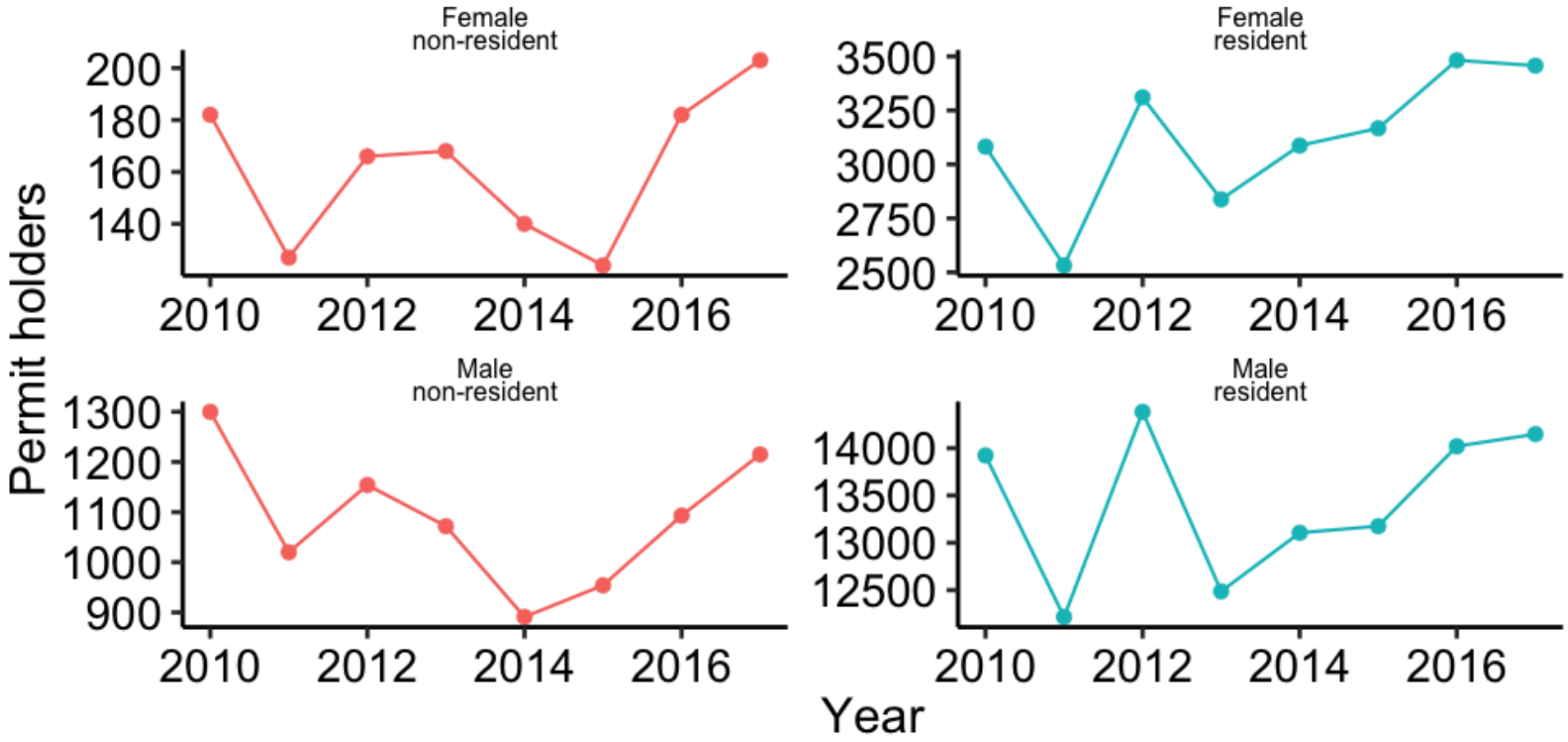

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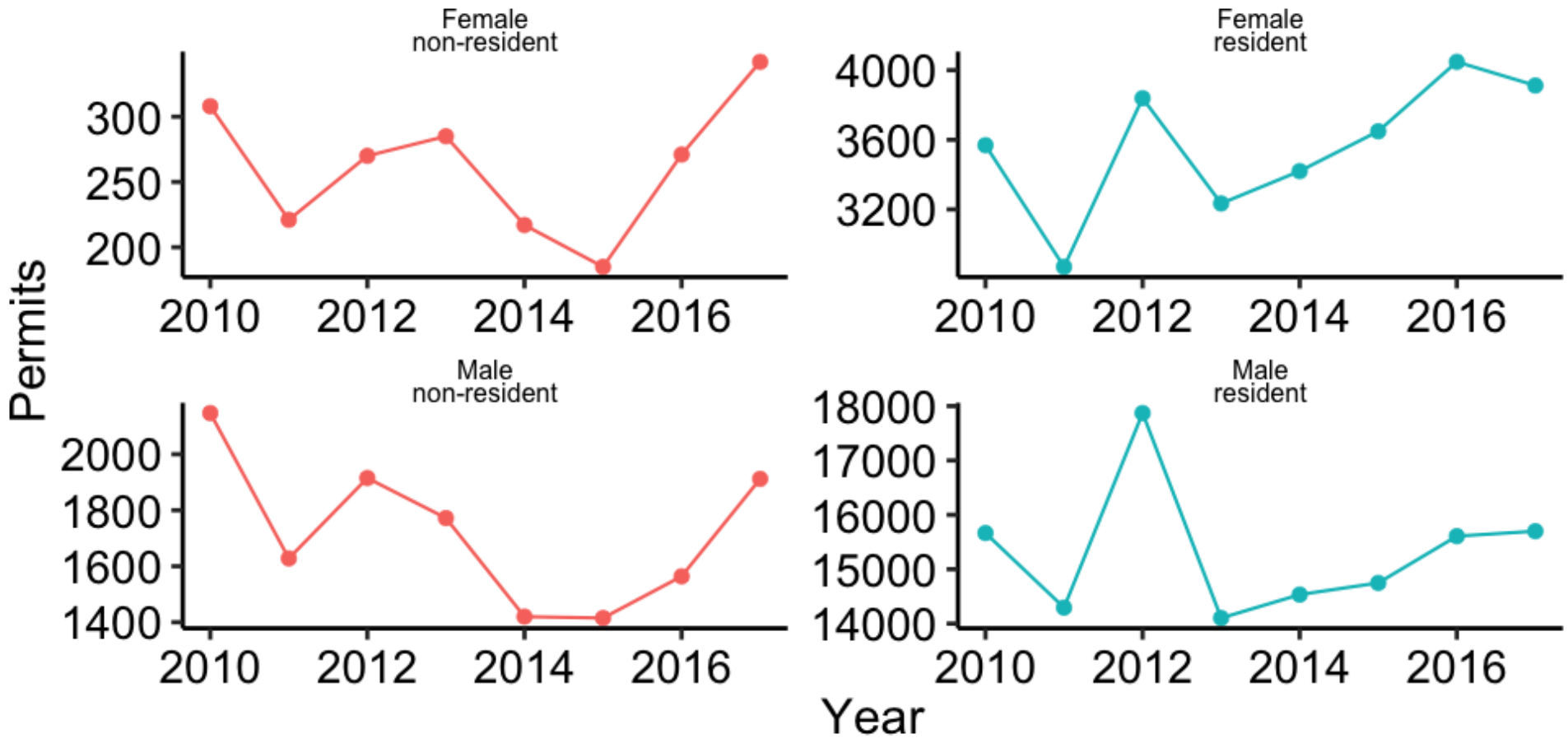

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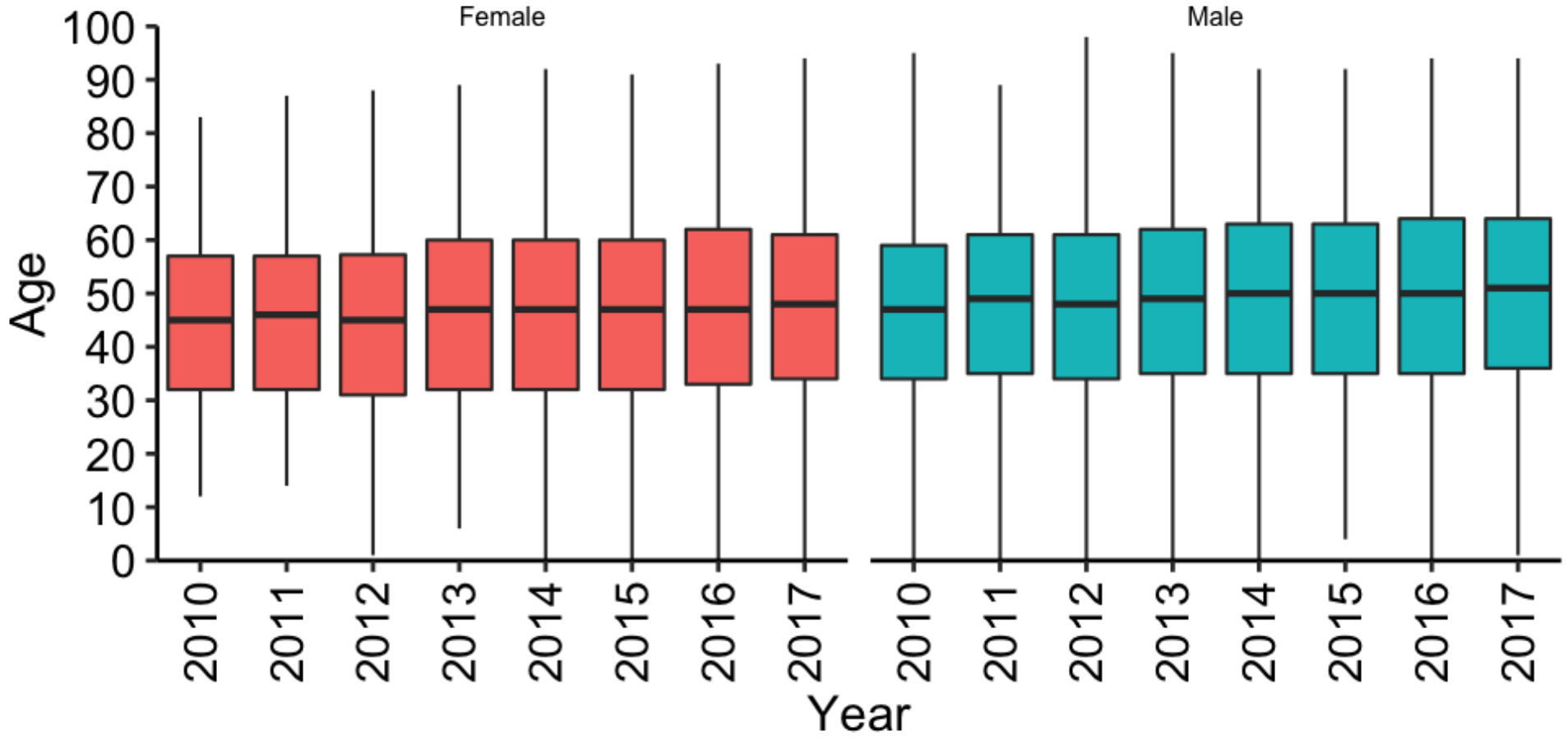
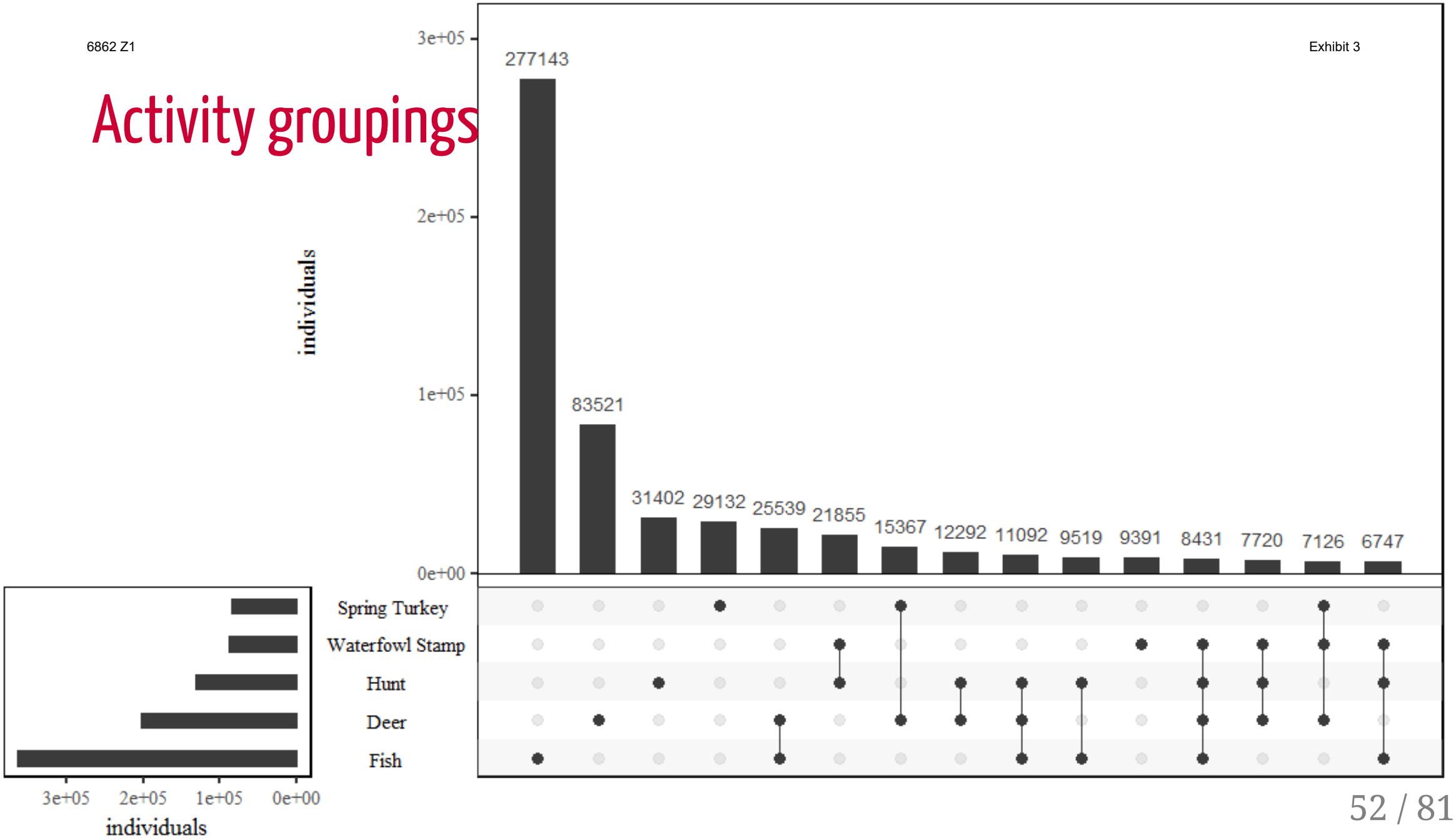


# What types of permits are bought together?

# Cross buying

> Cross-buying (i.e., the purchase of products from multiple categories) has been associated with greater levels of customer retention, revenue generation, and loyalty.

# Activity groupings



# Activity groupings

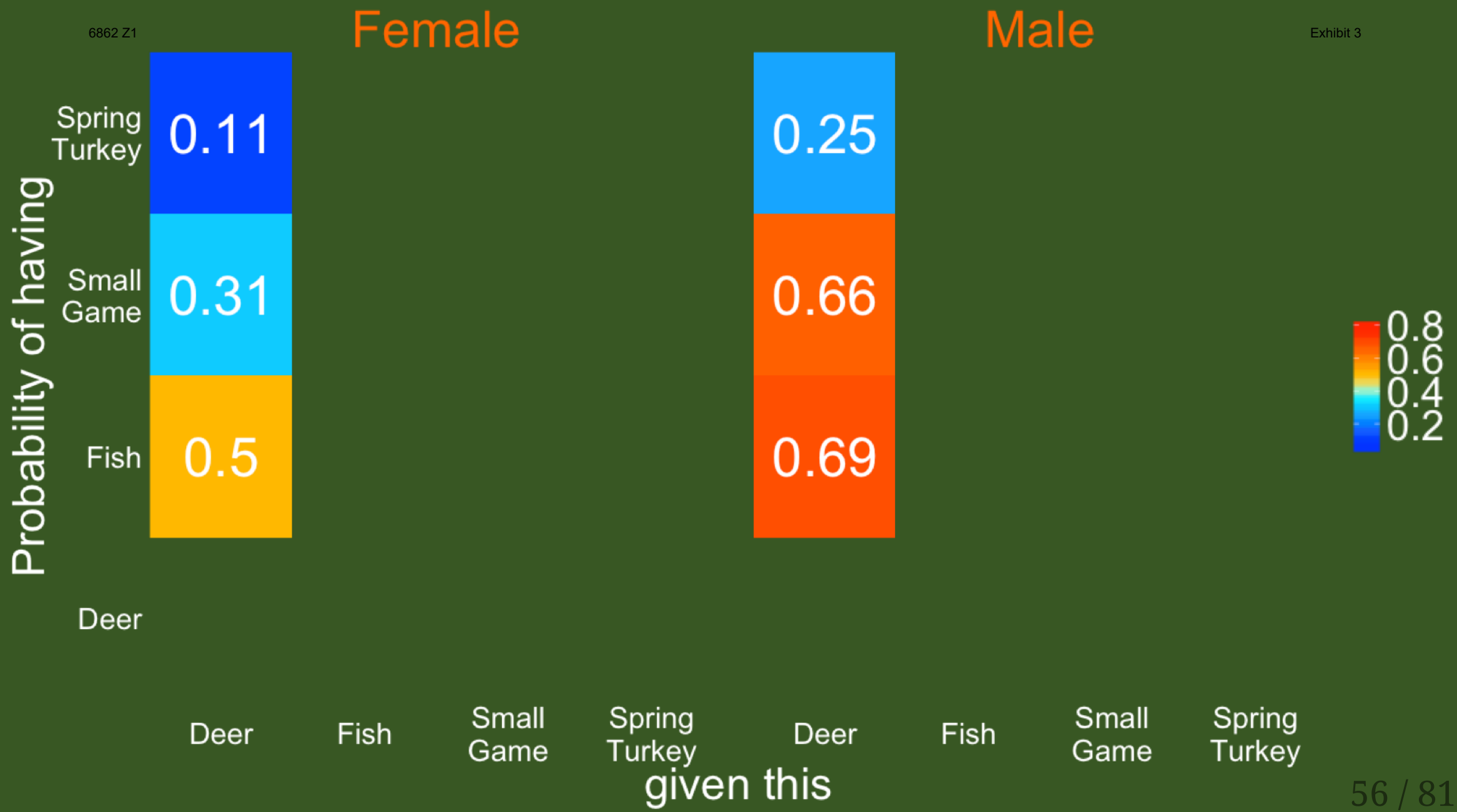
# Methods

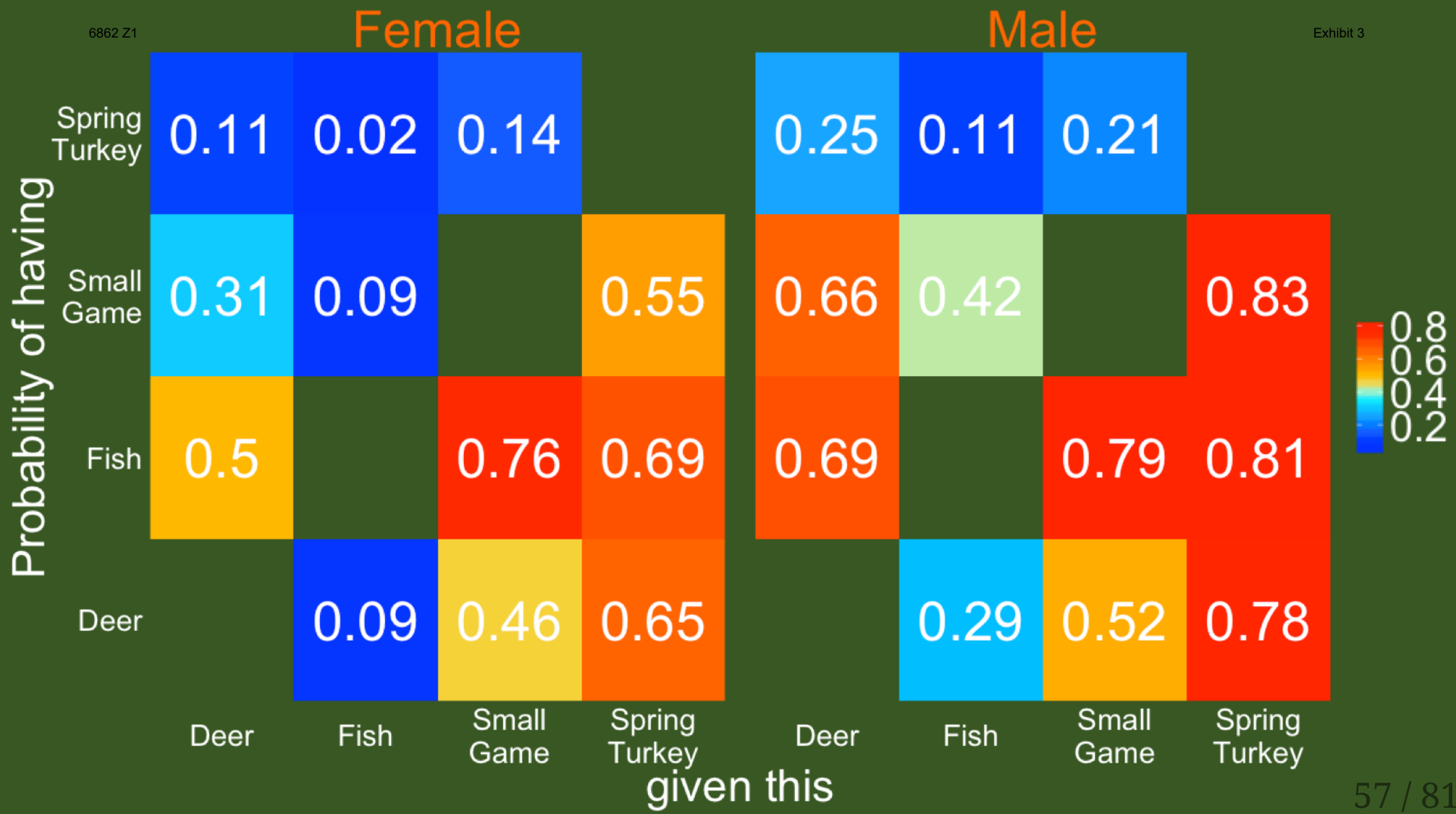
Nebraska Game and Parks Commission database

- Residents 16+ years old
- Annual and multi-year permits
- Lifetime & multi-year permits were split as individual permits (e.g., 3-year permit = 3 consecutive annual permits)
- Fish & Small Game combo permits = 1 Fish, 1 Small Game

# Female

Probability of having
Spring Turkey
0.11
Small Game
0.31
Fish
0.5
Deer
0.8
0.6
0.4
0.2
Deer
Fish
Small Game
Spring Turkey
given this


Female
Male
Probability of having
Spring Turkey
Small Game
Fish
Deer
0.11
0.31
0.5
0.25
0.66
0.69
0.8
0.6
0.4
0.2
Deer
Fish
Small Game
Spring Turkey
Deer
Fish
Small Game
Spring Turkey
given this

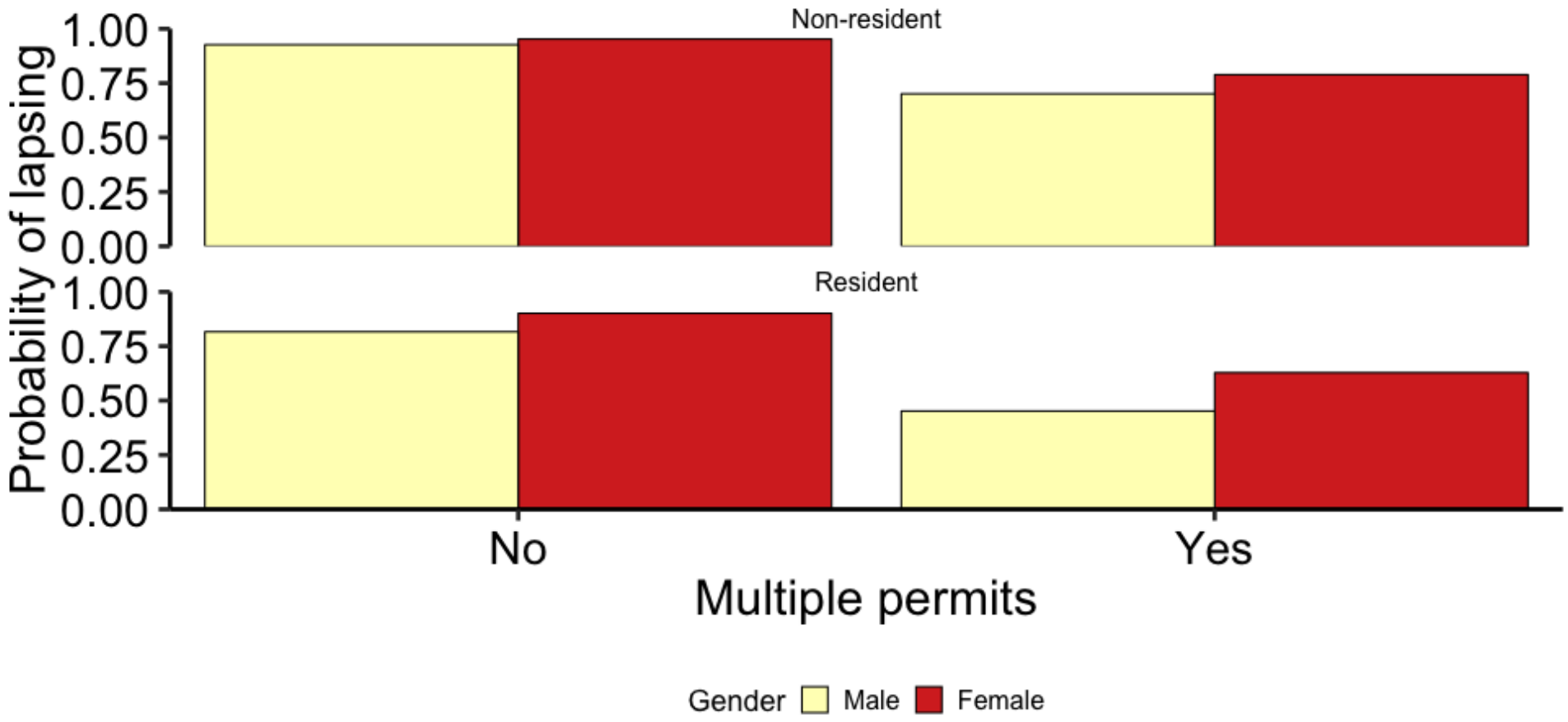

Female
Male
Probability of having
Spring Turkey
Small Game
Fish
Deer
0.11
0.02
0.14
0.31
0.09
0.55
0.5
0.76
0.69
0.09
0.46
0.65
0.25
0.11
0.21
0.66
0.42
0.83
0.69
0.79
0.81
0.29
0.52
0.78
0.8
0.6
0.4
0.2
Deer
Fish
Small Game
Spring Turkey
Deer
Fish
Small Game
Spring Turkey
given this

# Take home points

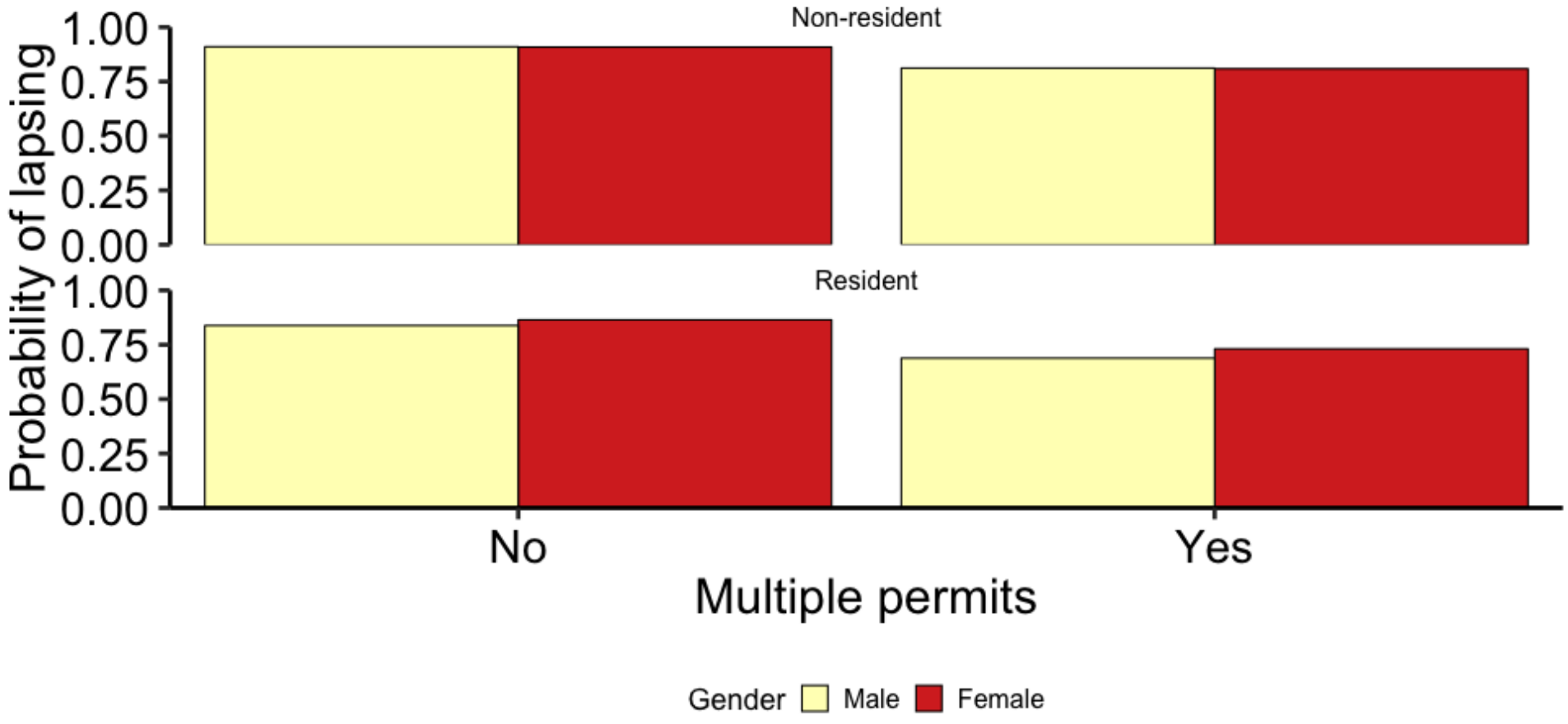
- NE anglers tend to only buy angler permits
- NE turkey hunters are invested
- Females are less likely to have multiple permits

# What is the relationship between cross-buying and lapsing?

# Deer hunters



# Anglers


Non-resident
Resident
Probability of lapsing
1.00
0.75
0.50
0.25
0.00
No
Yes
Multiple permits
Gender
Male
Female

# Take home points

- Anglers probability of lapsing is greater
- Non-residents and females more likely to lapse
- Unkown whether cross-buying prevents lapsing or those that dont lapse just buy more permits

# How dynamic are permit holders?

# Modelling dynamics of sportspersons

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  - Focused on **Retention** and **Reactivation**

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  - Inactive broken into 5 levels (1-yr inactive, 2-yr inactive, …)

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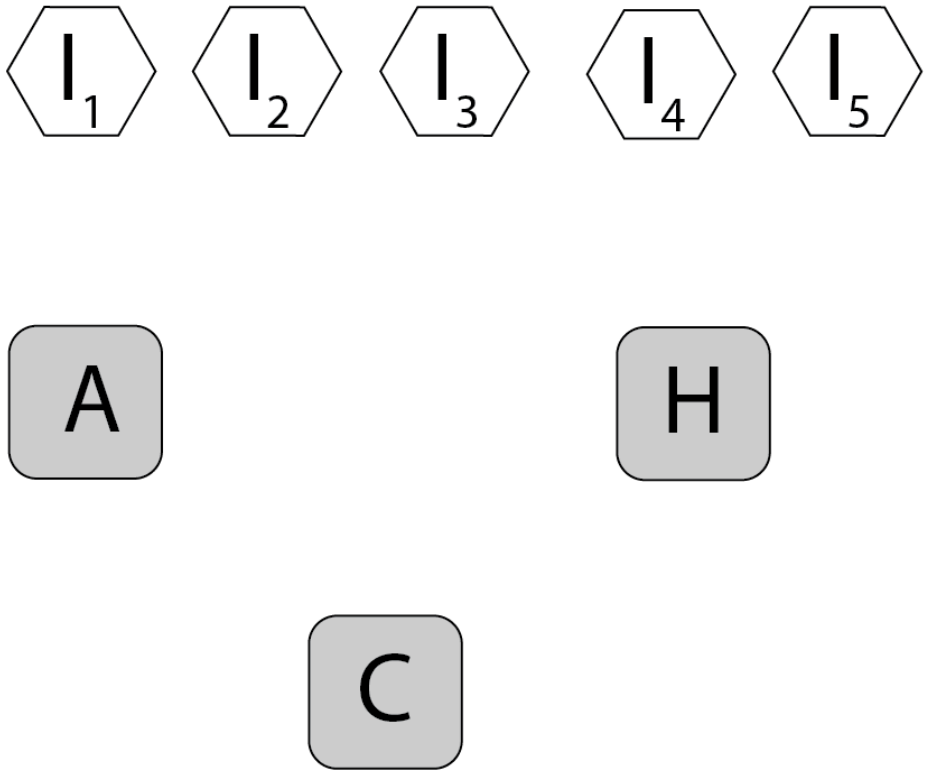
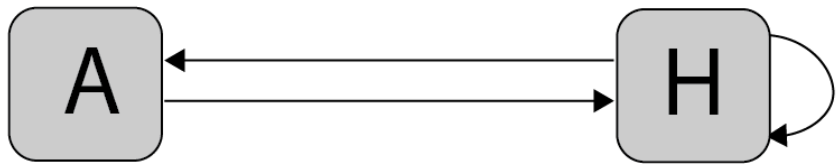
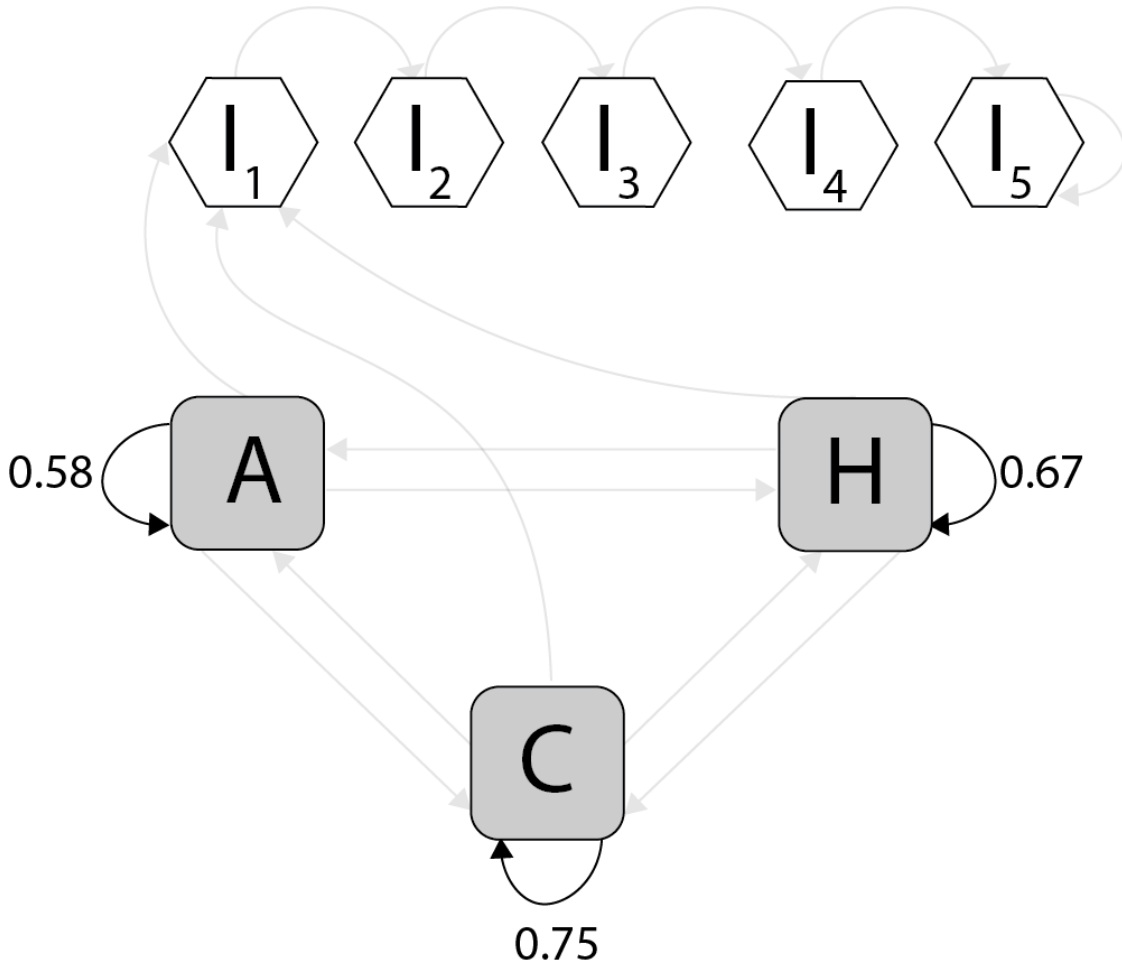
  - Inactive broken into 5 levels (1-yr inactive, 2-yr inactive, …)
- Modeled the probability that a sportsperson would transition between groups

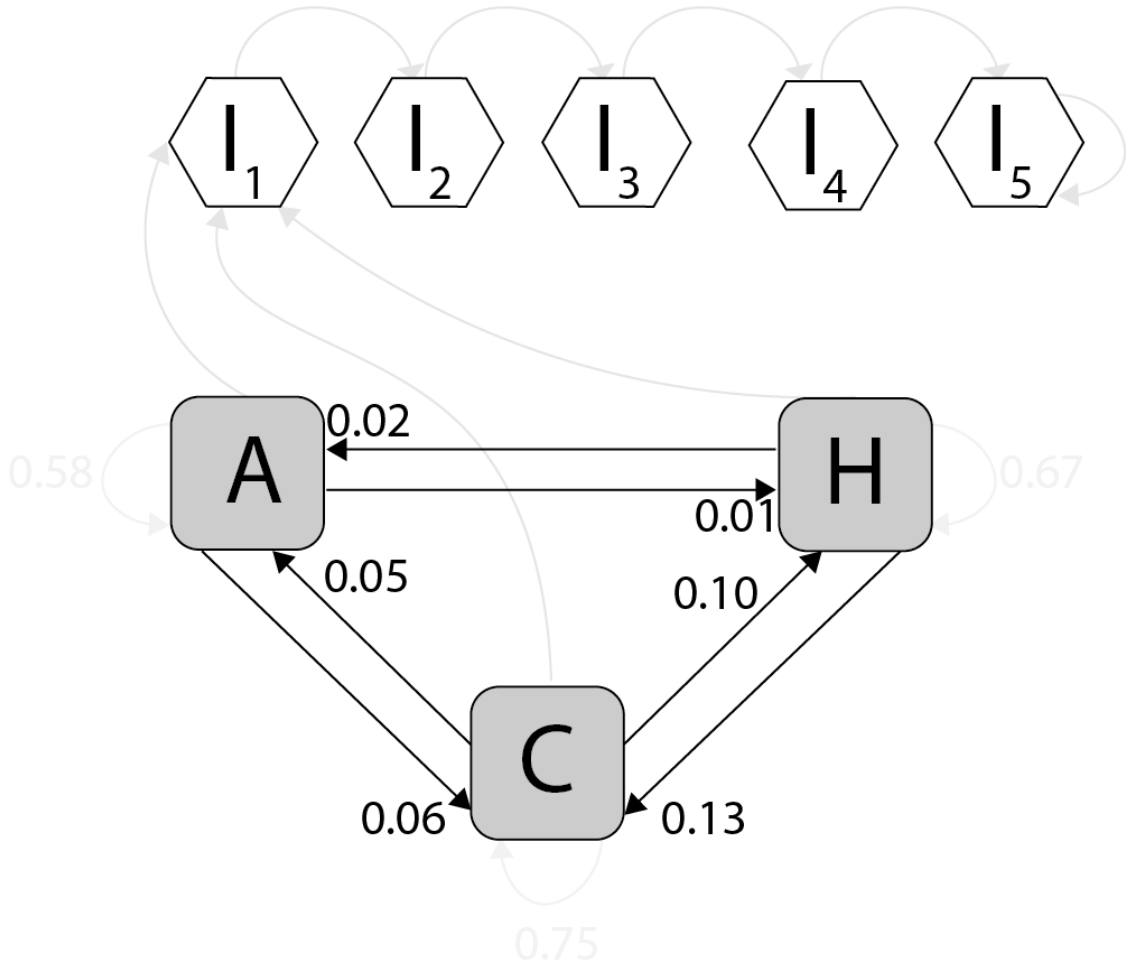

I1
I2
I3
I4
I5
A
H
C

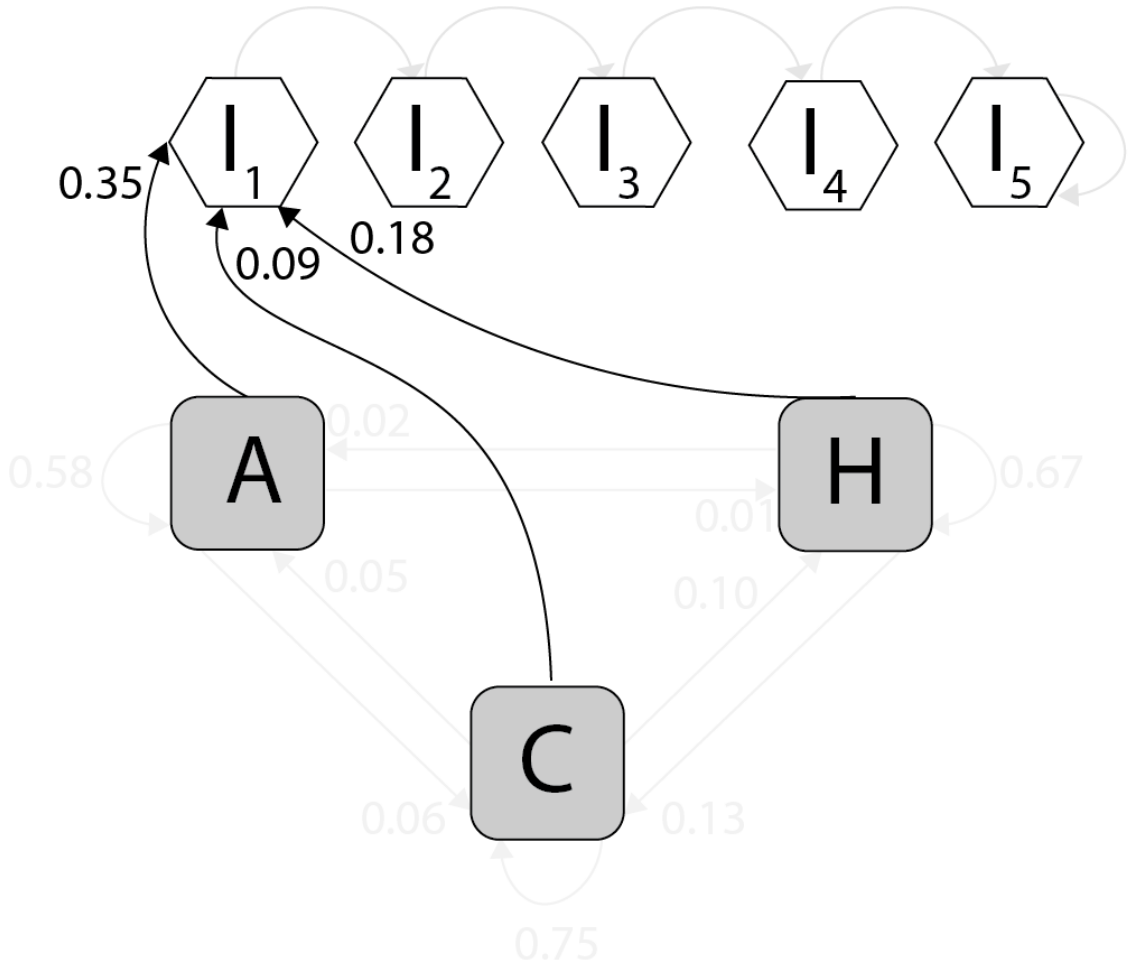
I1
I2
I3
I4
I5

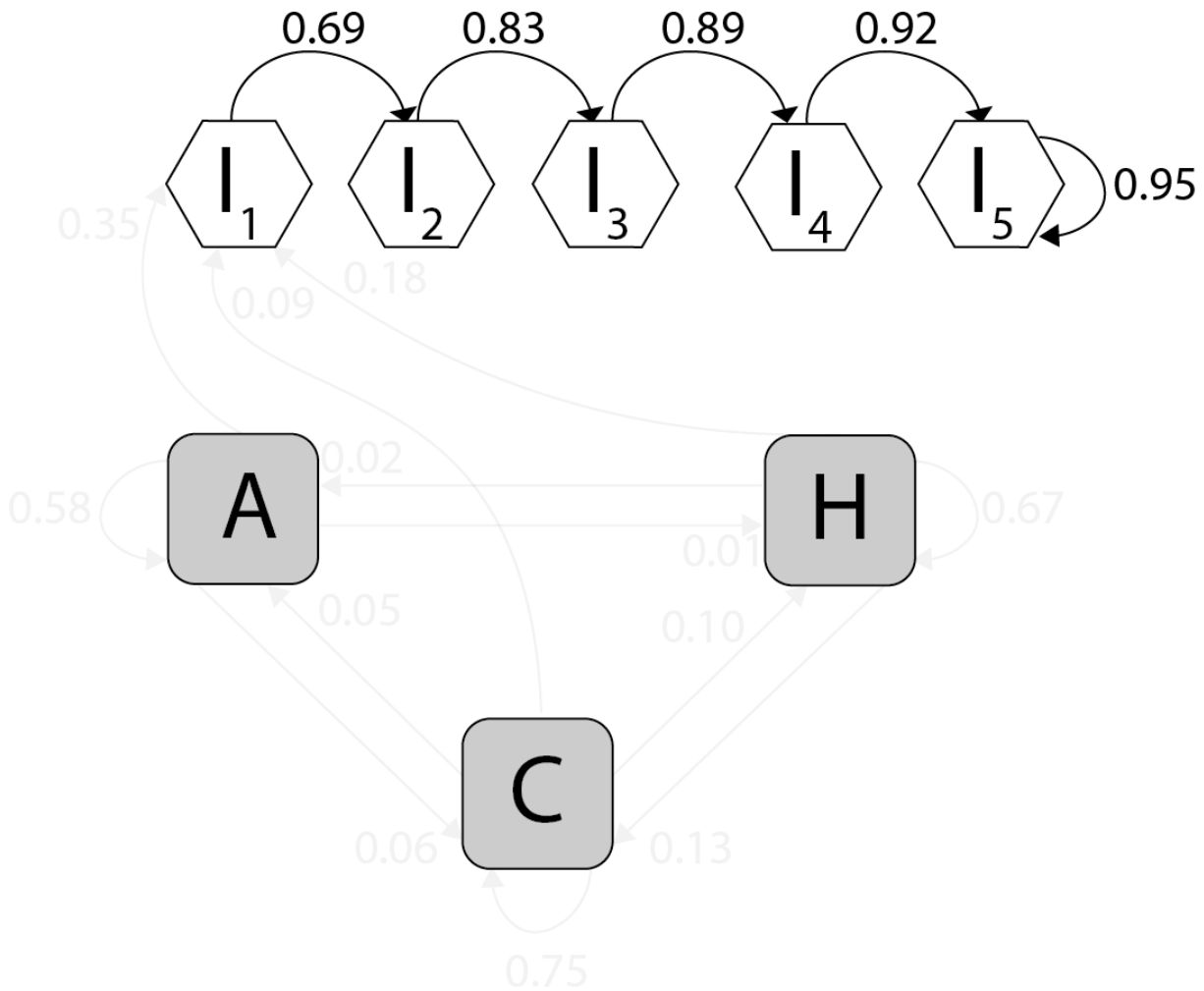

A
H

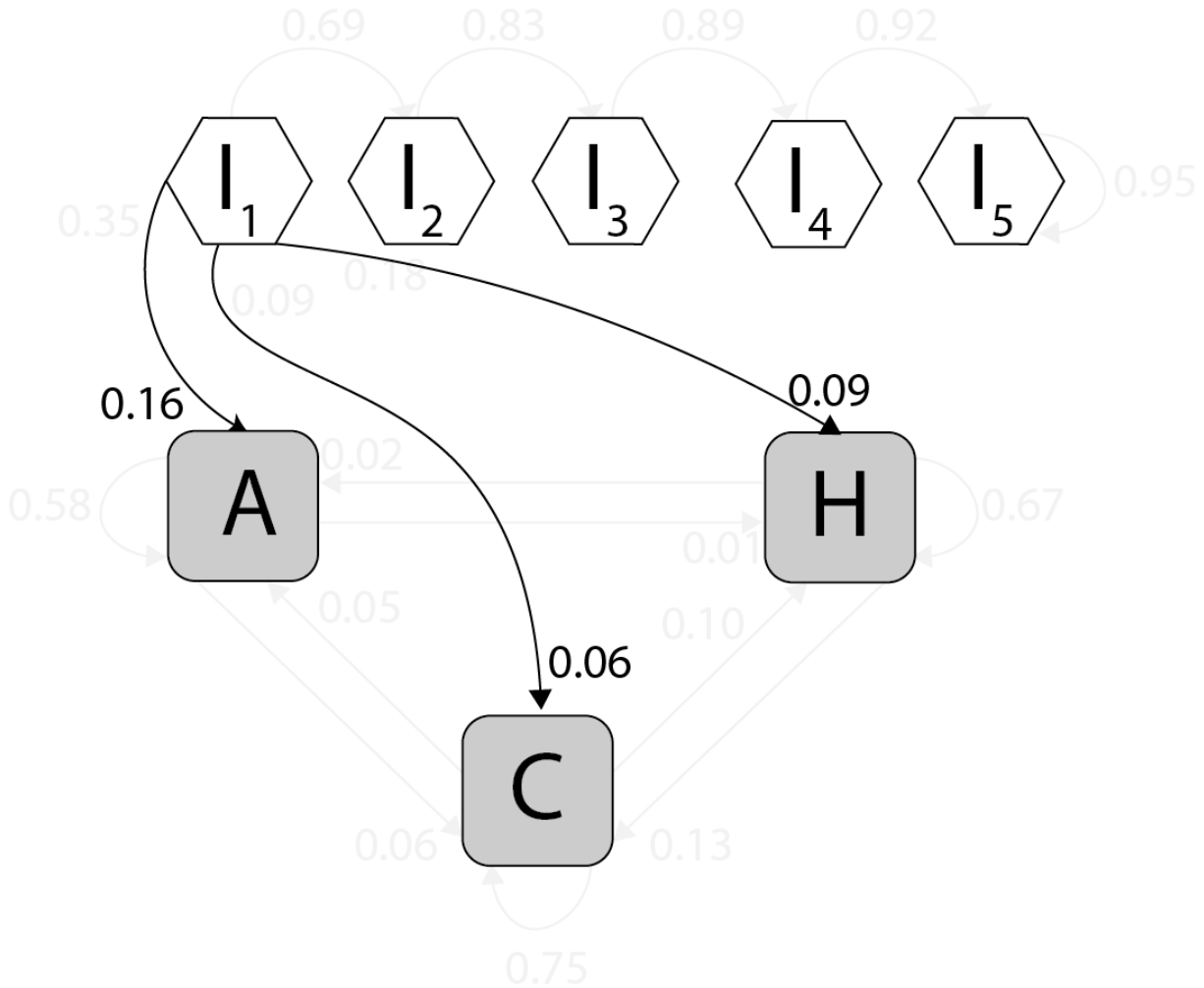
C


I1
I2
I3
I4
I5
A
H
C
0.58
0.67
0.75


I1
I2
I3
I4
I5
A
H
C
0.02
0.01
0.05
0.10
0.06
0.13
0.58
0.67
0.75


I1
I2
I3
I4
I5
0.35
0.09
0.18
A
H
C
0.02
0.58
0.67
0.01
0.05
0.10
0.06
0.13
0.75


0.69
0.83
0.89
0.92
I1
I2
I3
I4
I5
0.95
0.35
0.09
0.18
0.02
0.58
A
H
0.67
0.01
0.05
0.10
C
0.06
0.13
0.75


I1
I2
I3
I4
I5
0.16
0.09
A
H
0.06
C

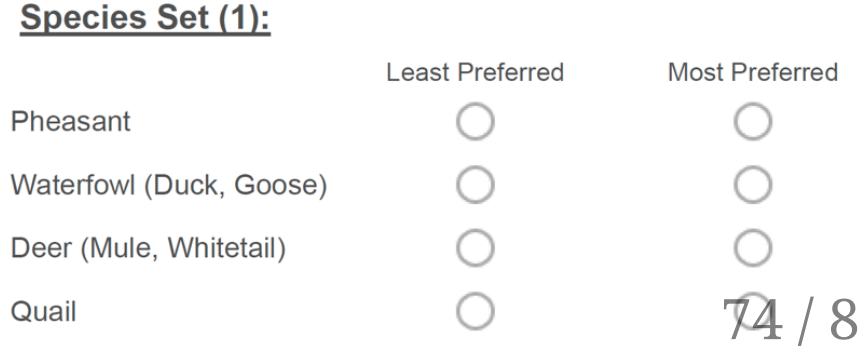
# Take home points

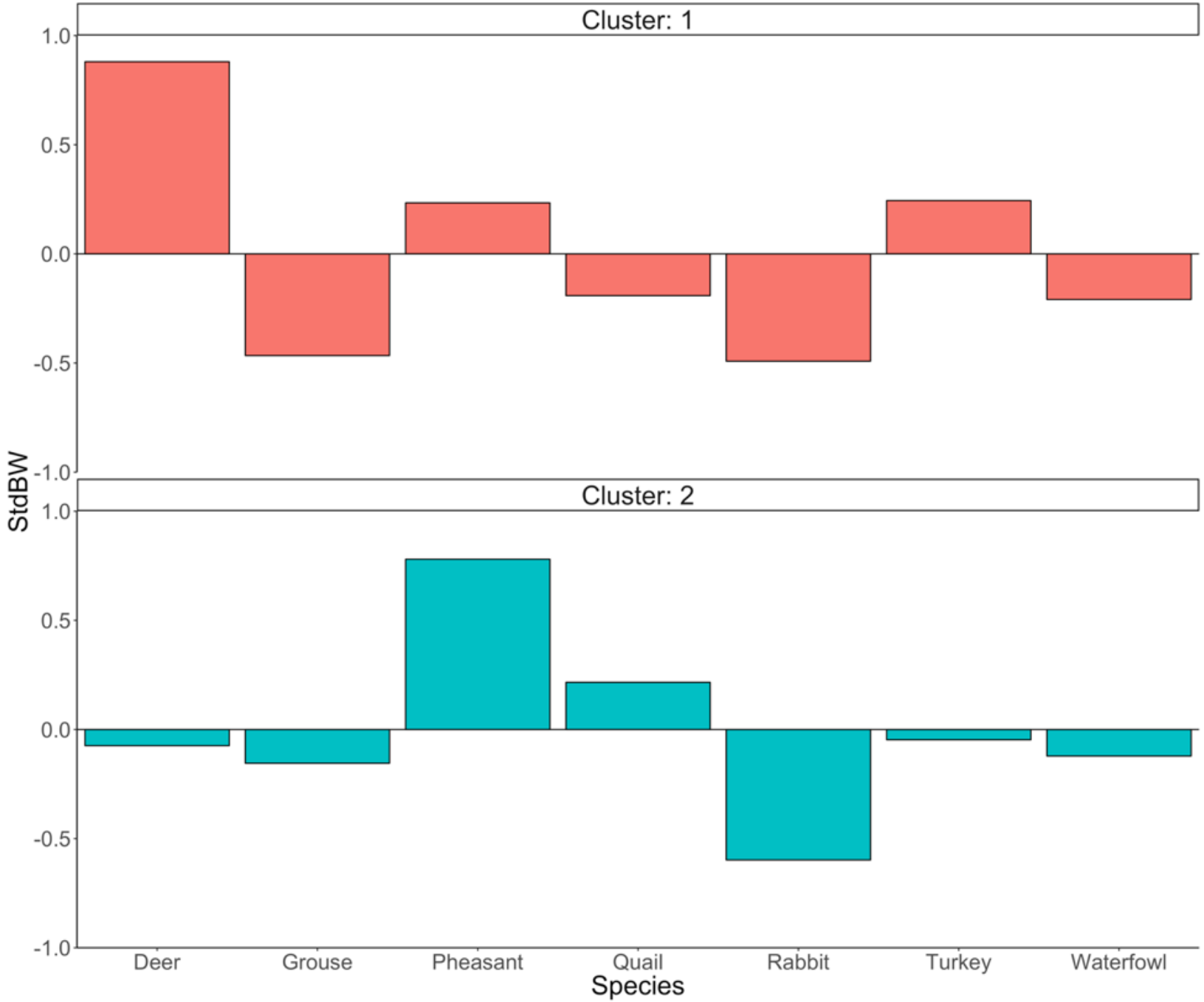
- Nebraska has growing angler numbers but decreasing hunter numbers
  - Similar to national trends
- **Retaining** and **Reactivating** sportspersons is important
  - Especially those recently lapsed
- After becoming inactive for a few years, it is unlikely they are returning
- Currently low probability of transitioning between hunting and fishing
- Need to better understand how to R3 efforts influence transition probabilities

# What motivates our hunters?

# Motivation survey

- In 2015, sent out 7000 survey invitations to random selection of deer, small game, turkey, and combo permit holders
- Species preference questions using best worst choice approach
- Why participate?
  - socializing, enjoying nature, and enjoying solitude
  - Challenge factors (e.g., harvest a trophy, fill bag or tag)
  - Consumption factors (i.e., providing meat for me, family or friends)
- What prevents participation?
  - Costs (4), Access (3), Activity (4), Game populations (2), Regulations (2)




Cluster: 1
Cluster: 2
StdBW
1.0
0.5
0.0
-0.5
-1.0
Deer
Grouse
Pheasant
Quail
Rabbit
Turkey
Waterfowl
Species

| Factor | Upland game preference | Big game Preference | P | Effect size |
|---|---|---|---|---|
| **Setting motivation** | | | | |
| Spending time outdoors/experiencing nature | 4.58 (0.65) | 4.55 (0.70) | 0.555 | |
| **Social motivation** | | | | |
| Spending time with family or friends | 4.38 (0.86) | 4.32 (0.97) | 0.379 | |

| Factor | Upland game preference | Big game Preference | P | Effect size |
|---|---|---|---|---|
| **Hunt motivations** | | | | |
| Harvesting a trophy animal | 1.99 (1.20) | 2.68 (1.30) | <0.001 | -0.542 |
| Obtaining my bag limit/filling my tag | 2.34 (1.13) | 2.57 (1.22) | 0.006 | -0.192 |
| Providing meat for myself, family, or friends | 2.74 (1.30) | 3.65 (1.22) | <0.001 | -0.731 |
| Managing game populations | 3.13 (1.25) | 3.62 (1.14) | <0.001 | -0.416 |
| Enjoying solitude | 3.79 (1.14) | 4.06 (1.02) | 0.001 | -0.253 |
| Hunting for the challenge | 3.61 (1.14) | 3.94 (1.03) | <0.001 | -0.319 |

| Factor | Upland game preference | Big game Preference | P | Effect size |
|---|---|---|---|---|
| **Hunt motivations** | | | | |
| Opportunity to get a shot at an animal | 2.99 (1.28) | 3.03 (1.25) | 0.714 | |
| Outwitting difficult-to-hunt species | 3.23 (1.30) | 3.47 (1.28) | 0.013 | -0.183 |
| Observing game species | 3.86 (1.08) | 4.06 (0.94) | 0.013 | -0.196 |

# Barriers

| Factor | Upland game preference | Deer preference | P | Effect size |
|---|---|---|---|---|
| Cost | 1.86 (1.11) | 2.13 (1.17) | <0.001 | 0.243 |
| Access | 3.17 (1.49) | 3.05 (1.50) | 0.058 | |
| Activity | 1.67 (0.94) | 1.59 (0.90) | 0.029 | -0.080 |
| Game populations | 3.15 (1.37) | 2.49 (1.20) | <0.001 | -0.487 |
| Regulations | 1.90 (1.16) | 2.05 (1.17) | 0.029 | 0.113 |

# Dashboard

## HuntFishApp

# NEBRASKA

# HUNTER & ANGLER RESEARCH

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