# Effects of American Kestrel Nest Boxes and Perches on Fruit-eating Bird Activity in Cherry Orchards

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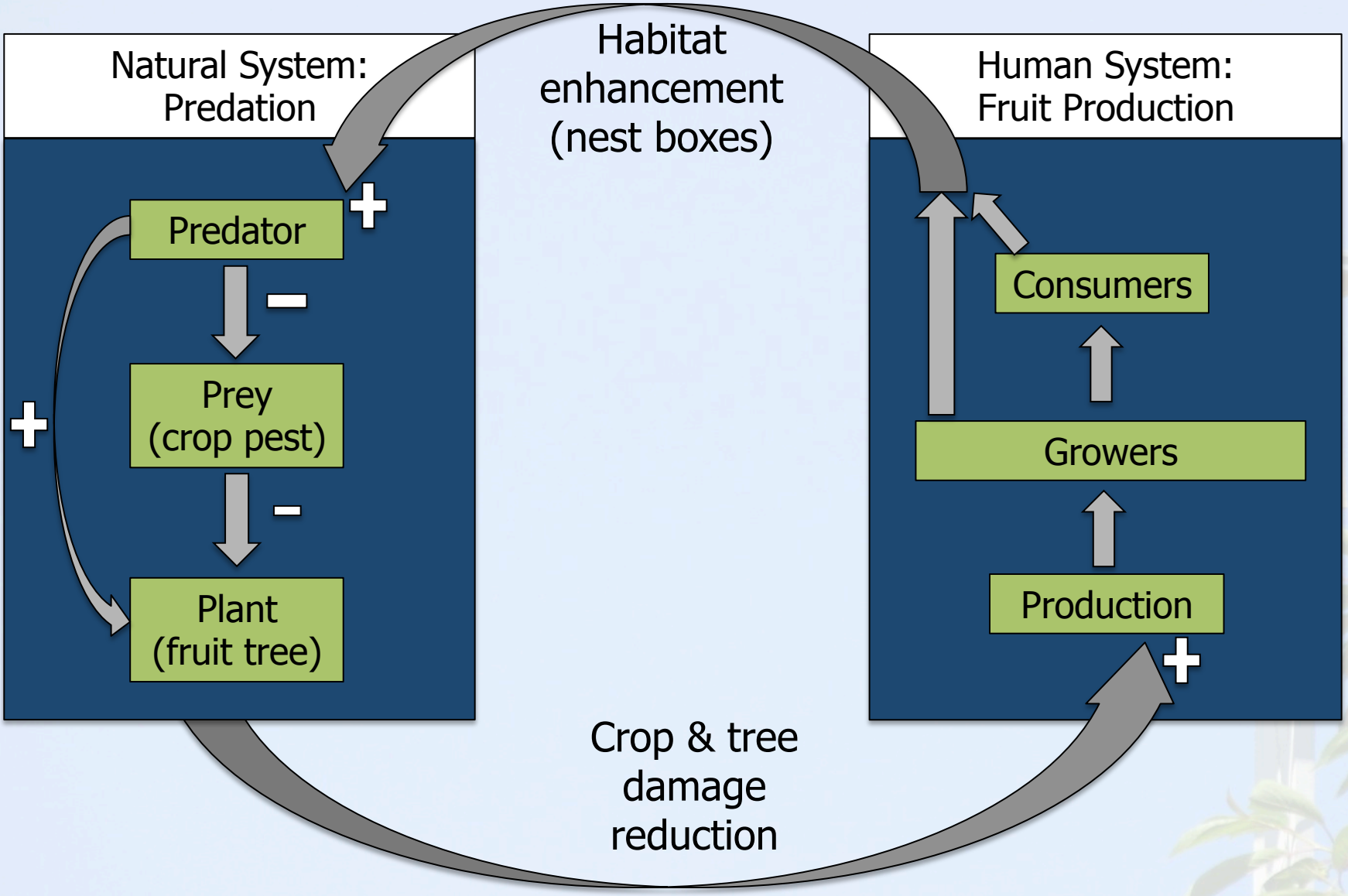
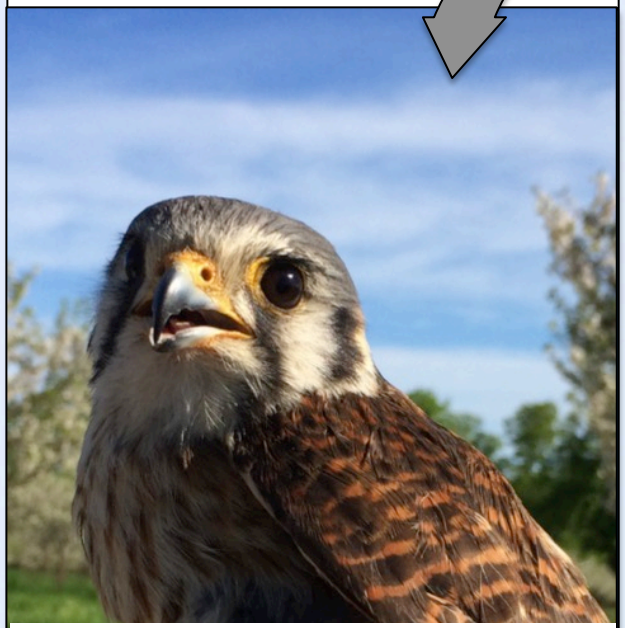
# Coupled Human and Natural System Overview



# Coupled Human and Natural System Overview

Natural System:
Predation



American Kestrel
(*Falco sparverius*)

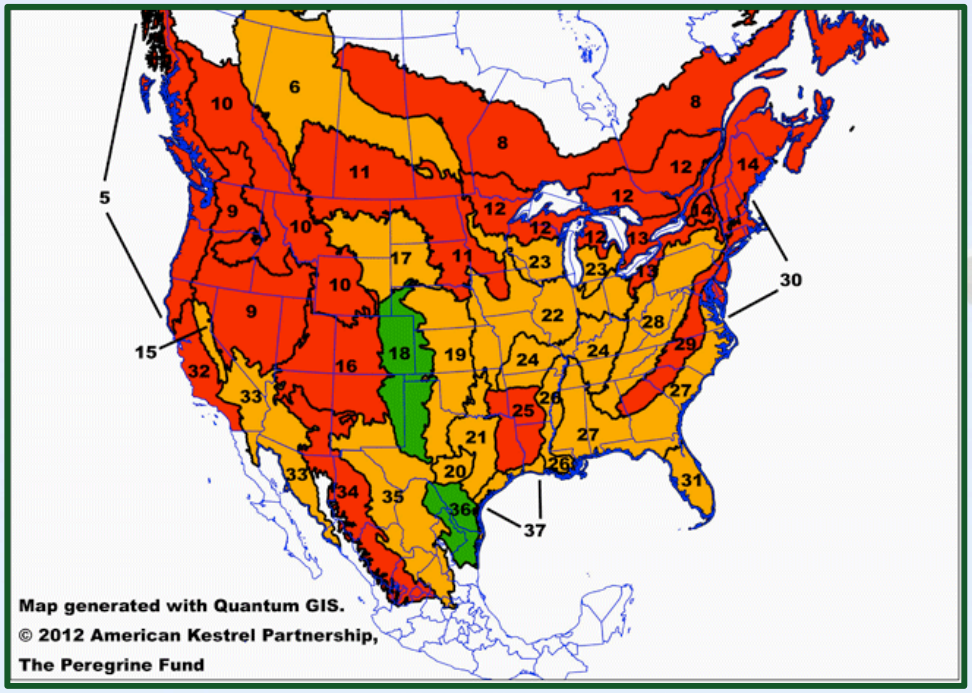
Human System:
Fruit Production

*Prunus* spp.

Crop & tree
damage
reduction

(e.g. Kross et al. 2012)

# Kestrel Conservation Concern




Widespread population declines due potentially to habitat loss and/or effects of climate change on distribution

(Smallwood et al. 2009; Paprocki et al. 2014)

# Cherry Orchard Nest Boxes in Michigan


# Cherry Orchard Nest Boxes in Michigan

Table 1. Nesting attempts, apparent nesting success, and mean productivity (number of fledglings per box with nesting attempts) for new nest boxes in Michigan cherry orchards in 2013 – 2015.

| Year | Boxes Available | % Boxes Occupied | Nesting Attempts Initiated | % Nesting Success | Mean Productivity |
|---|---|---|---|---|---|
| 2013 | 8 | 100 | 8 | 100 | 4.25 |
| 2014 | 18 | 83 | 16 | 88 | 3.87 |
| 2015 | 18 | 100 | 19 | 89 | 3.56 |
| Total | 44 | 93 | 43 | 91 | 3.80 |

(Shave & Lindell 2017, *Journal of Raptor Research*)

# Kestrels Consume Orchard Pests




# Project Hypothesis

Kestrels can reduce fruit-eating bird abundances by:

- Consuming birds (direct effect)

# Project Hypothesis

Kestrels can reduce fruit-eating bird abundances by:

- Deterring birds that identify kestrel presence as sign of predation threat (indirect effect)


M. Trewet


P. Rosen

# Project Prediction

Thus, orchards with active kestrel boxes and perches will have lower fruit-eating bird abundances than those without

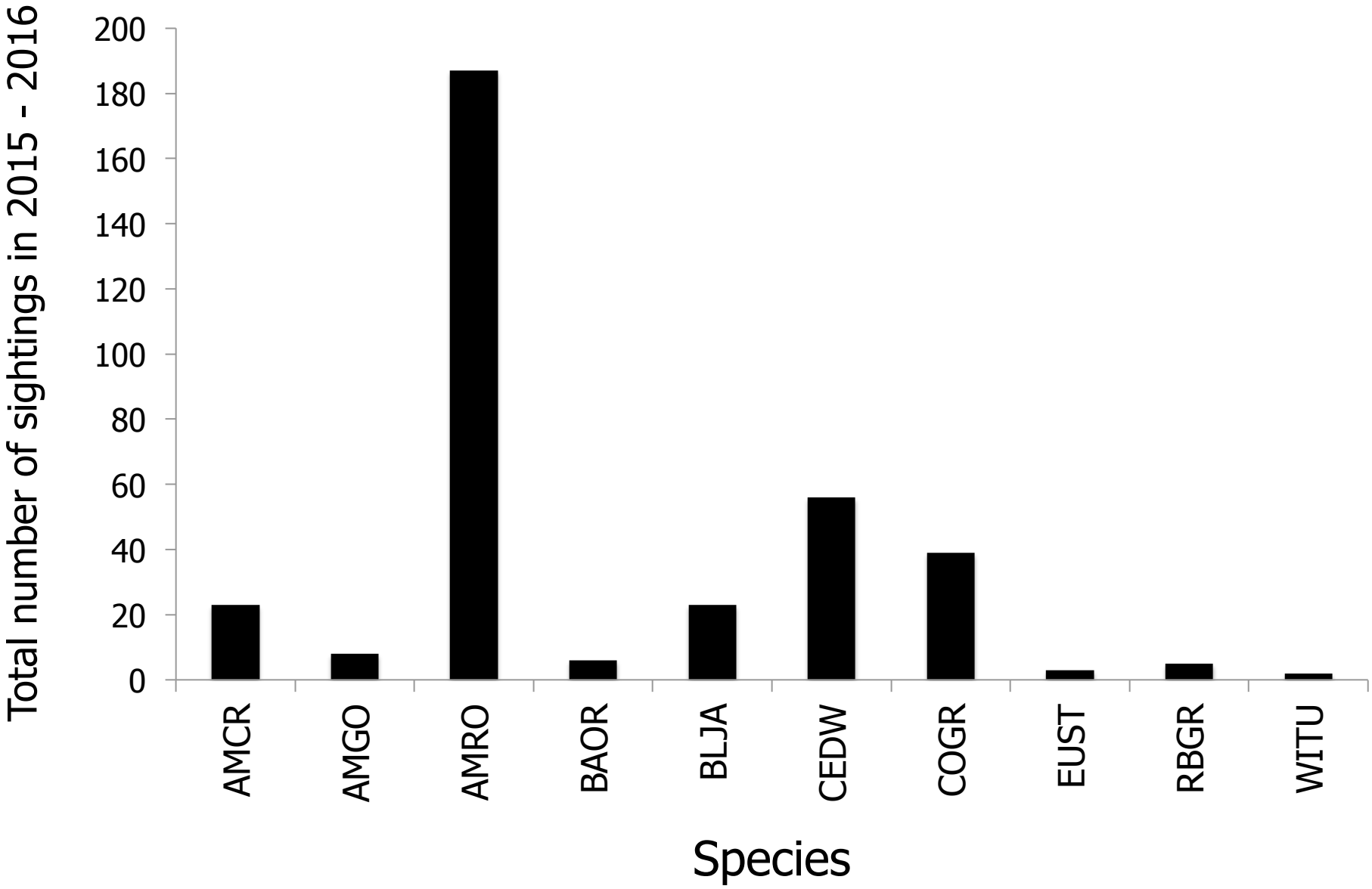
# 2015 Perch Installation

- Installed at 6 sites with active kestrel boxes
- 3 perches per site
- Sweet & tart blocks of various ages
- Monitored perch use with video cameras

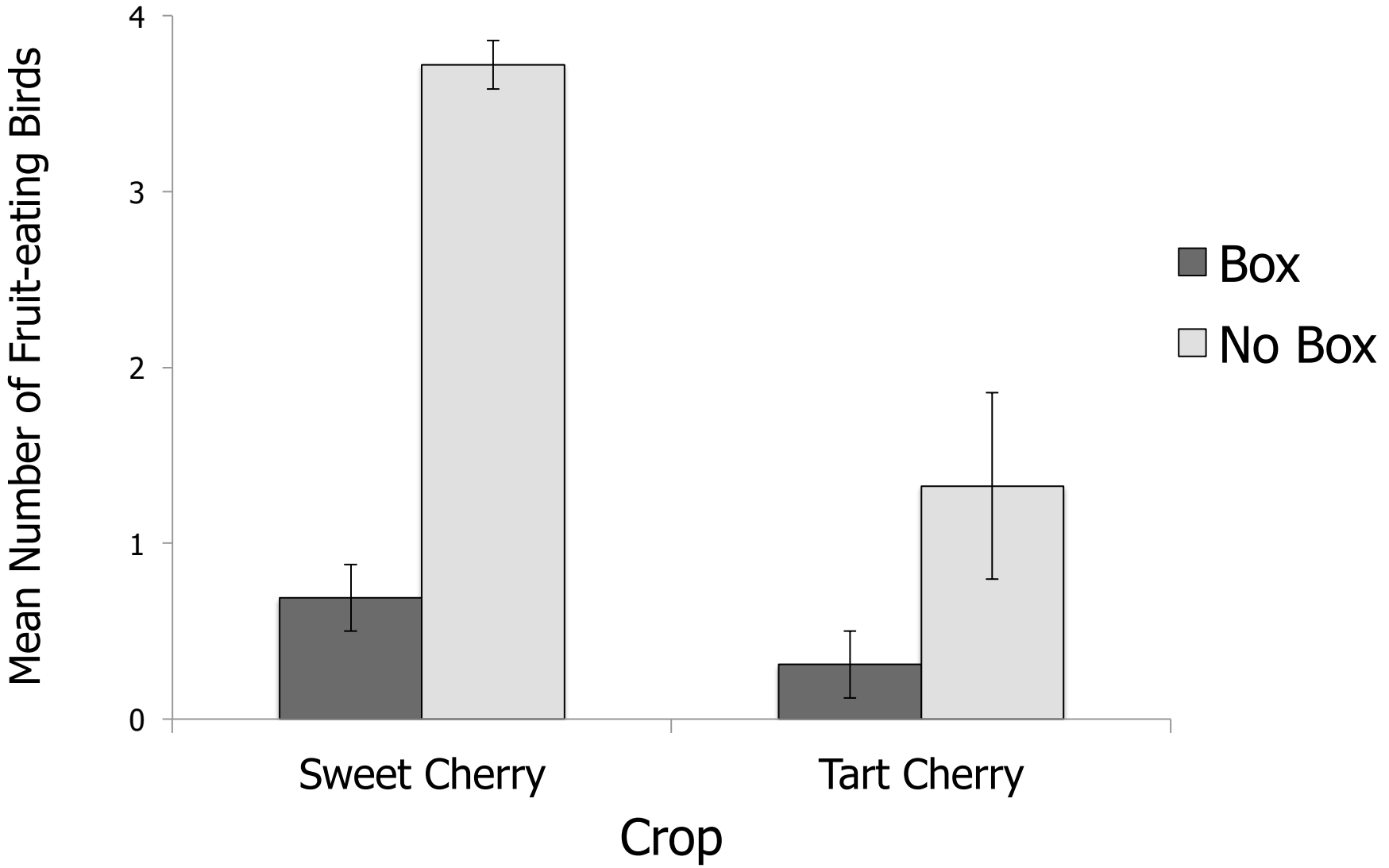
# 2015 & 2016 Fruit-eating Bird Surveys

- Transect surveys
  - Surveyed sweet (2015 & 2016) and tart (2015) blocks
  - 200 m x 6 row area surveyed in block
  - 10 min surveys
- 3 site treatments
  - Active nest box
  - Active box + perches
  - No active box

# Fruit-eating Bird Sightings by Species



# Fruit-eating Bird Abundances Lower at Sites with Kestrel Boxes



# Kestrel Perch Use

Perches did not have significant effect on prey bird abundances

Kestrels mostly used perches in blocks with trees shorter than 3 m (10 ft)

Both adults and fledglings used perches


# Take Home Messages

An active kestrel nest box can reduce fruit-eating bird abundances in neighboring orchard blocks

Adult and fledgling kestrels use perches in young blocks

# Ongoing Work

Estimating value of orchard nest boxes using regional economic modeling

Measuring winter rodent activity in orchards

New nest boxes in Michigan blueberry fields

# Acknowledgments

Many thanks to the growers who allowed us to install boxes/perches and conduct surveys in their orchards

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# Resources

Contact Information:

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Information on installing kestrel boxes in orchards:

http://birddamagetofruitcrops.info/PDFs/OrchardKestrelBoxFactSheet_20140310.pdf

Information on installing raptor perches:

https://efotg.sc.egov.usda.gov/references/public/WY/RaptorPerches.pdf

# References


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