Cormorant Predation Impacts on New Jersey Trout Stocked Ponds

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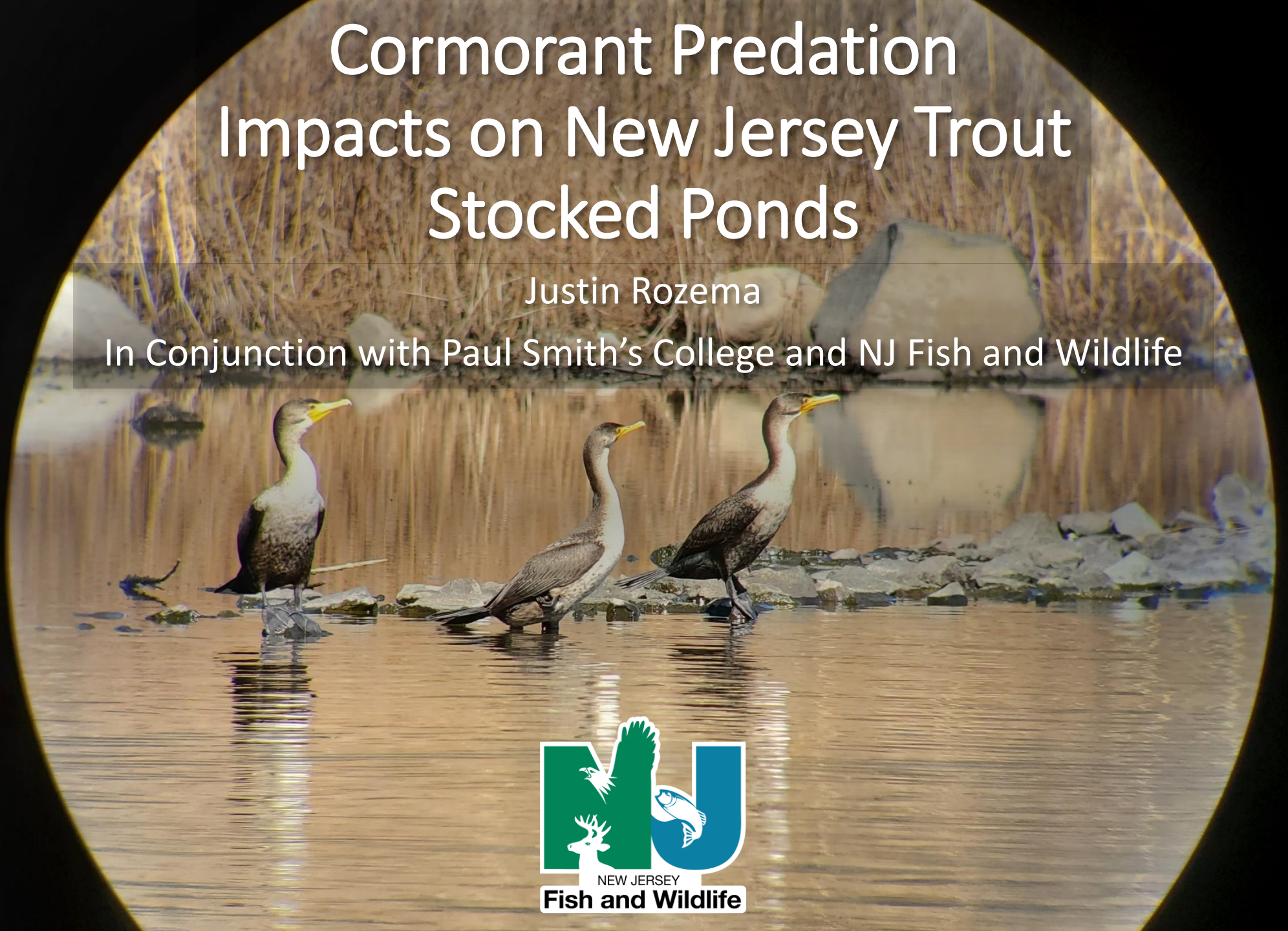
In Conjunction with Paul Smith's College and NJ Fish and Wildlife



NEW JERSEY
Fish and Wildlife

Cormorant Population and Life History

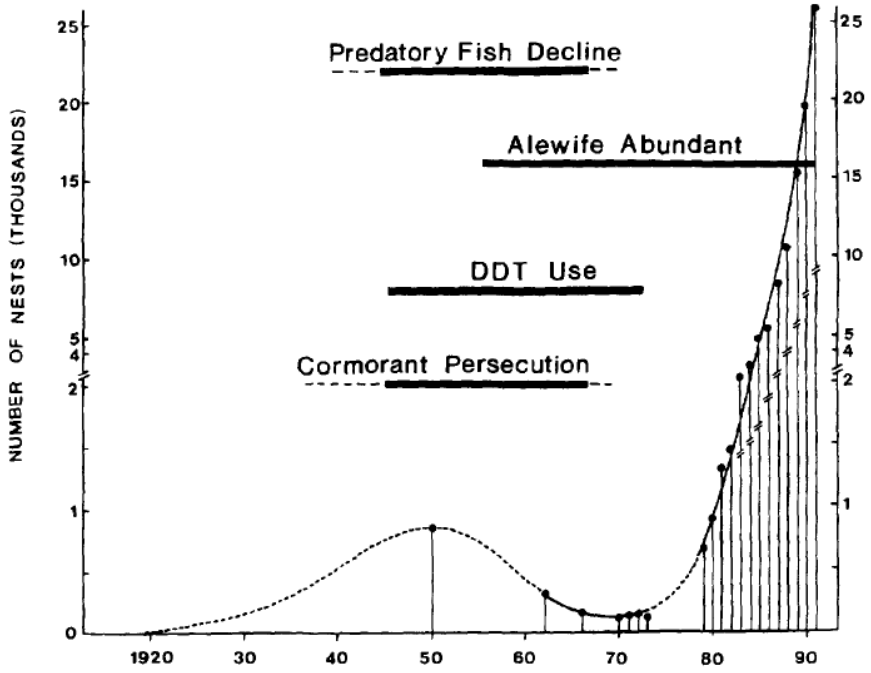
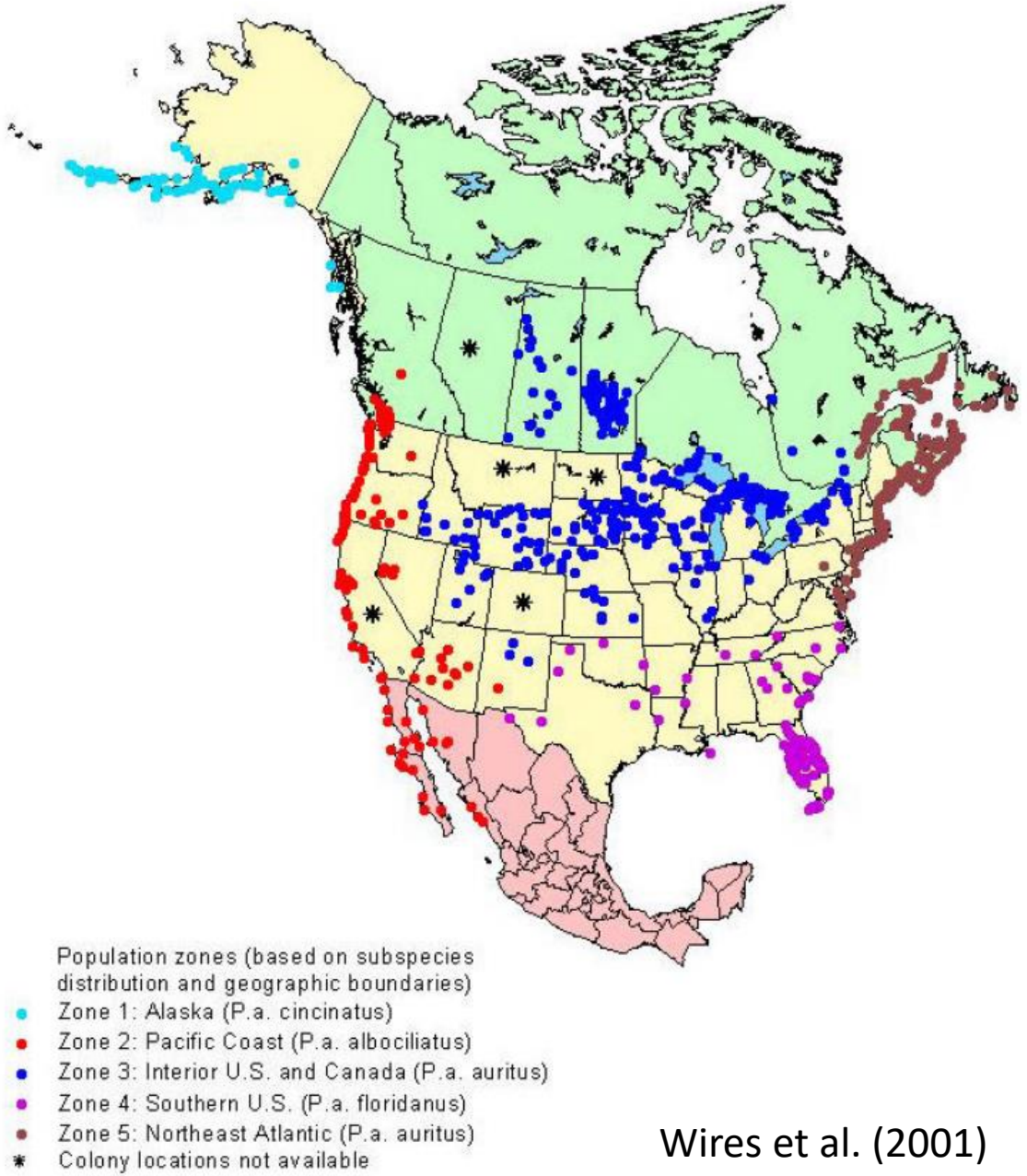


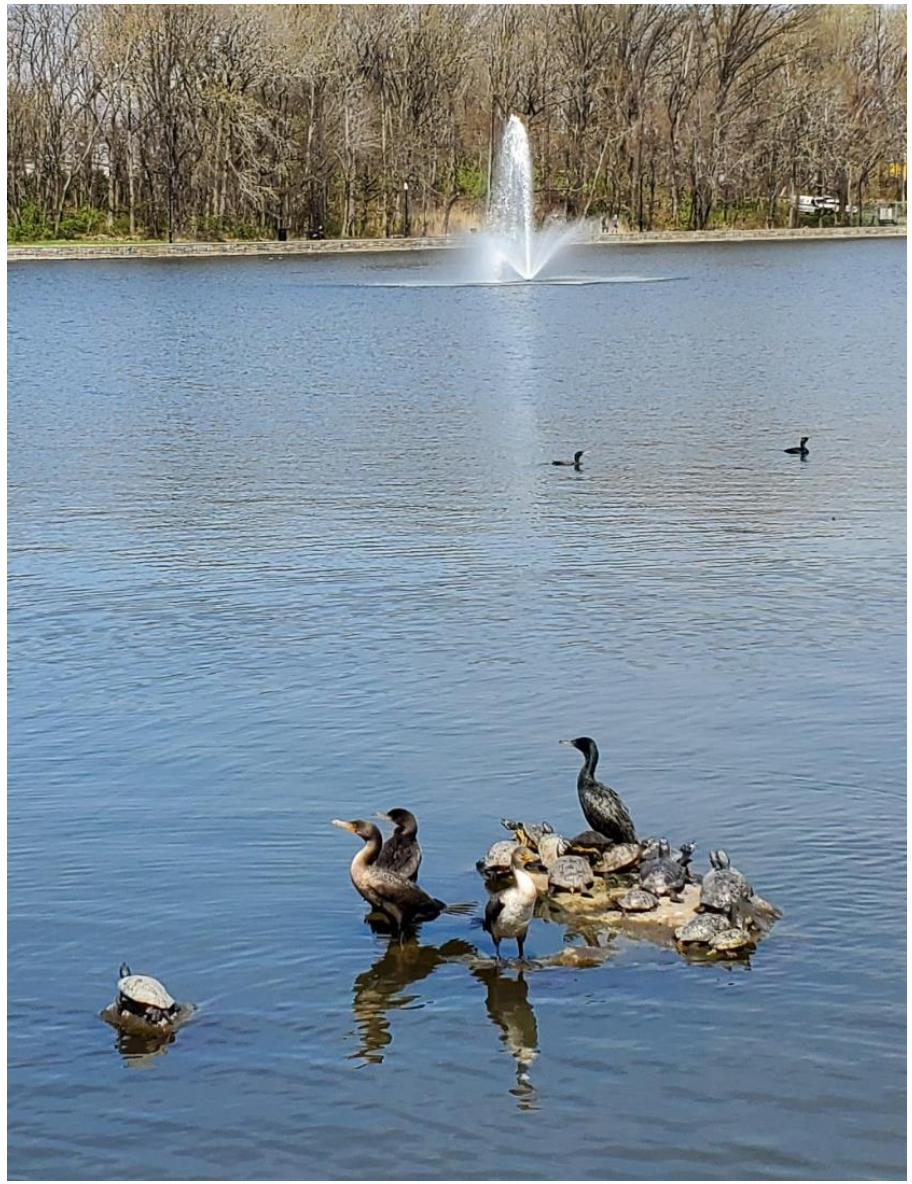
Figure 2. Changes in the estimated population size of Double-crested Cormorant in the study area, 1913-91. Population growth curve fitted by eye; solid line indicates known nest numbers; dotted line represents projected numbers based on interpolation and anecdotal information.

Figure 1. Distribution of Double-crested Cormorant (*Phalacrocorax auritus*) breeding colonies in North America 1970 – 2000.

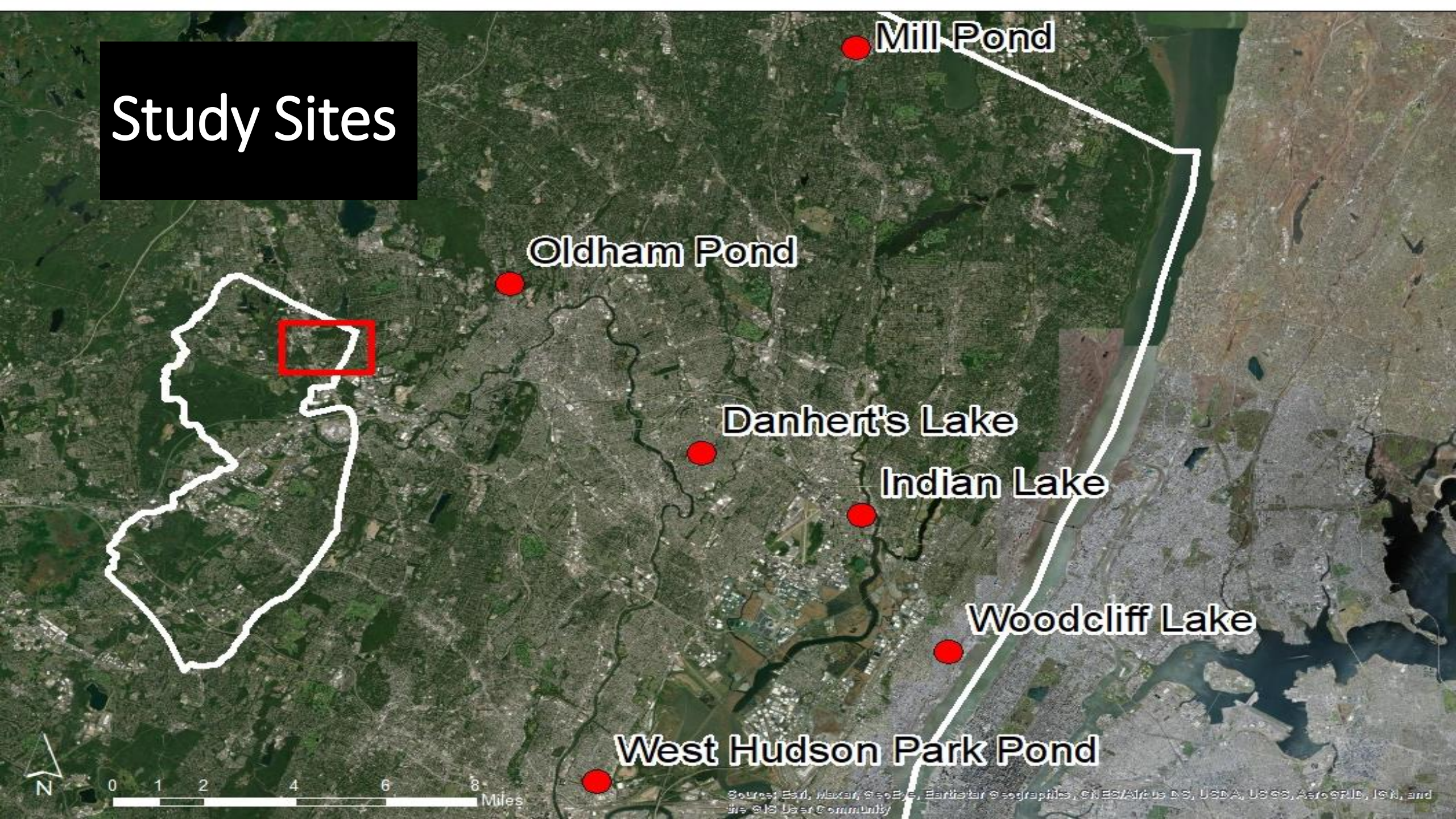


Wires et al. (2001)

Cormorants and NJ Anglers



Purpose of Study


Study Sites
Mill Pond
Oldham Pond
Danhert's Lake
Indian Lake
Woodcliff Lake
West Hudson Park Pond
N
0 1 2 4 6 8
Miles

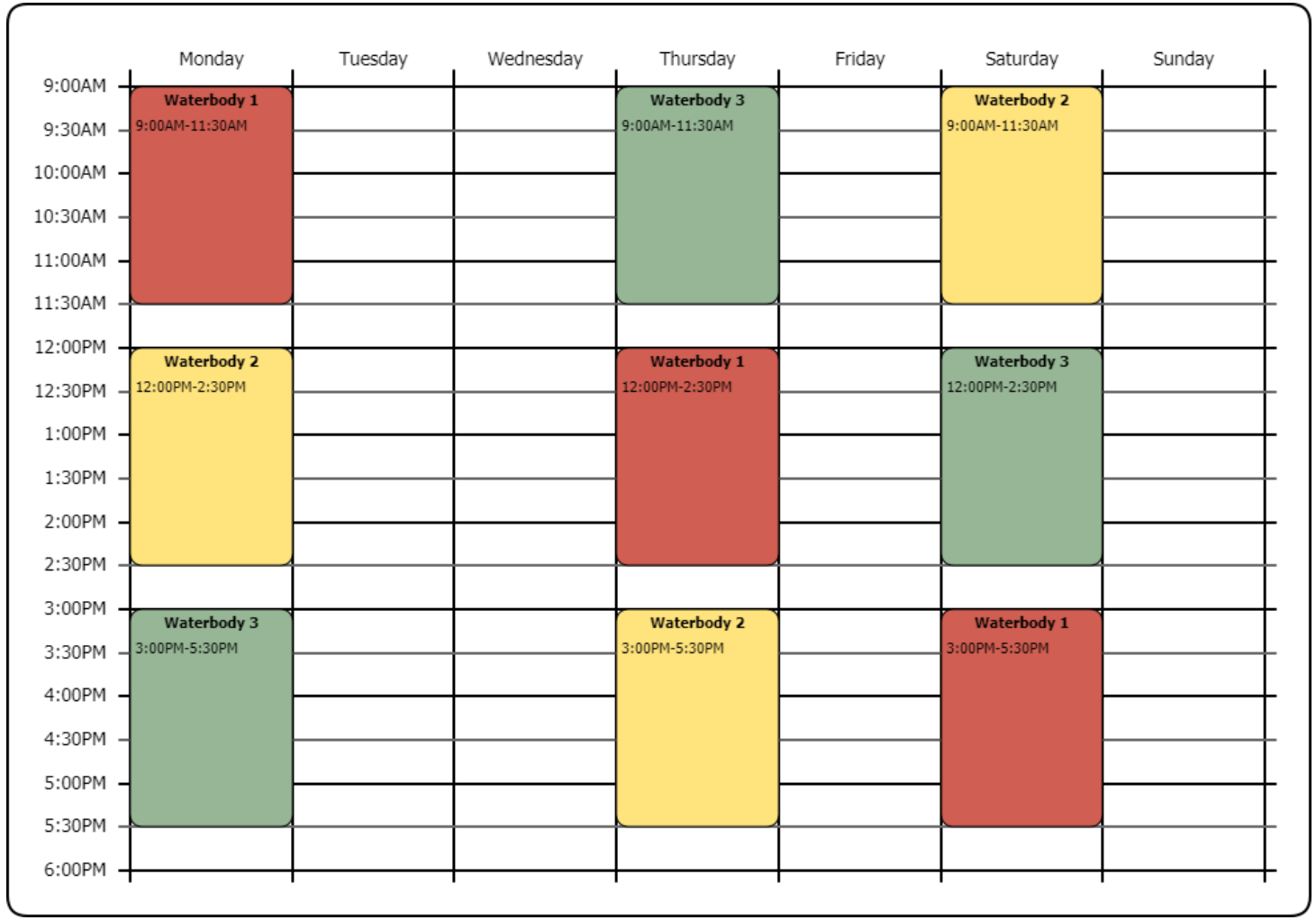
Study Design: Visitation Schedule

MARCH 2021

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
28	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15 STOCKED	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3

APRIL 2021

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
28	29	30	31	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	1



Study Design: Cormorant Monitoring

Creel Survey

Data Analysis

Bird Days

"One day spent by one cormorant at a given water"

- Estimated weekly by averaging cormorant counts and expanding across unvisited days
- Used to estimate usage of each water by cormorants

Cormorant Trout Consumption

$$\text{Estimated \# Consumed} = \frac{\text{\# Seen Caught}}{\text{\# Hours Visited}} \times \text{Total Daylight Hours}$$

- Estimated weekly
- Equation creates an average success rate (fish/hour) per waterbody and expands it to all daylight time during each week

Angling Success

$$\frac{\text{Total Hours Fished}}{\text{Total Trout Catch}}$$

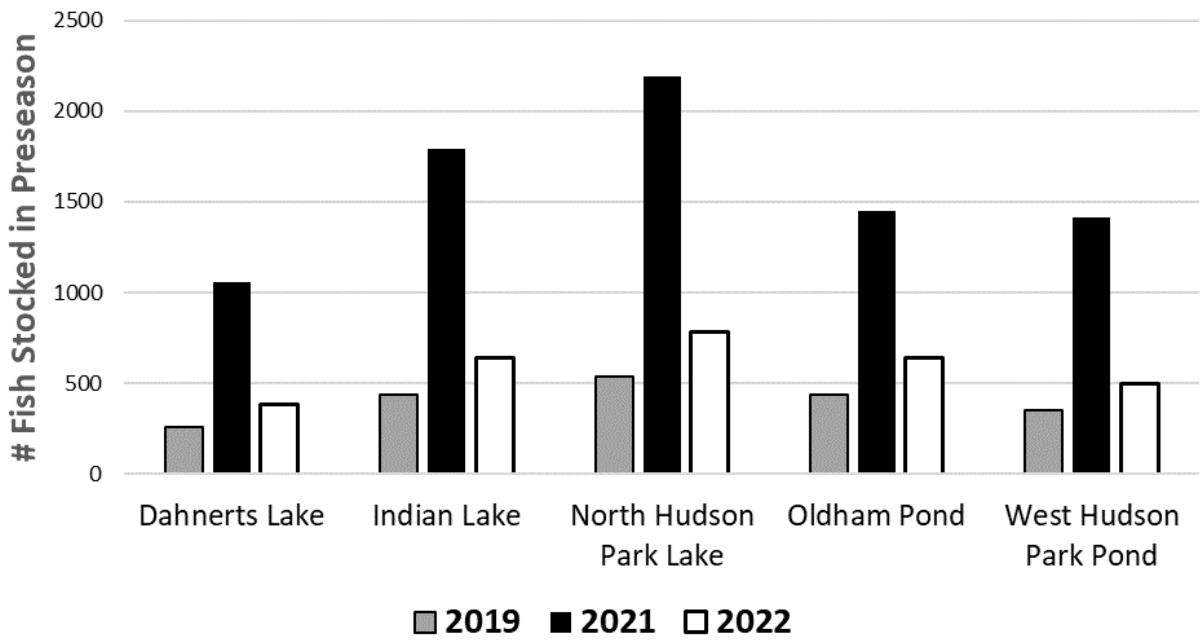
- Due to short sampling period (5 visitations, 1.5 weeks) angling success was not estimated weekly but as a total for each pond

Ottenbacher et al. (1994)

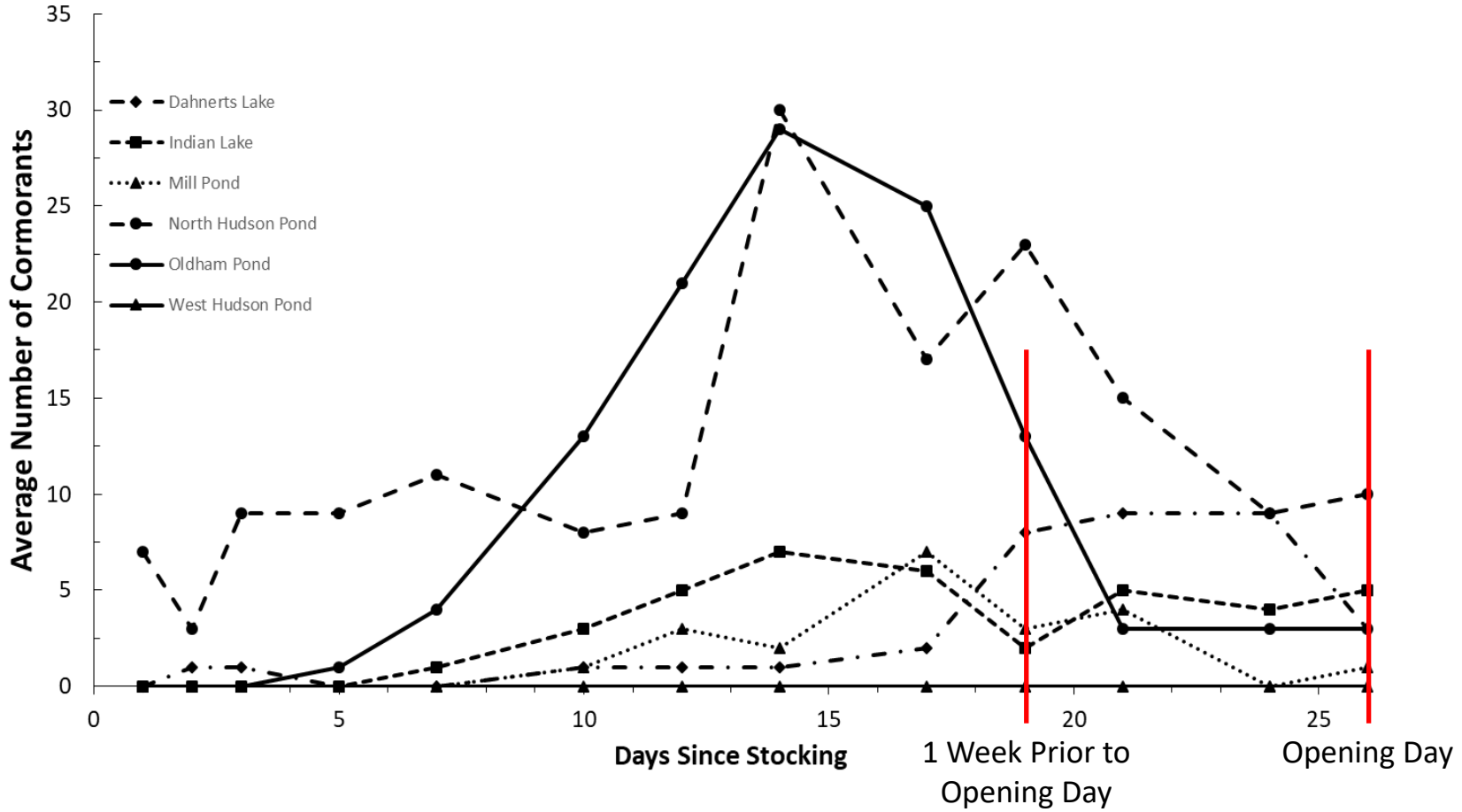
Deviations from Normal

- Elevated numbers of fish stocked during preseason from accelerated schedule

- Waterbodies were stocked 4 weeks prior to opening day. Normally, ponds are stocked within 1 week if a cormorant problem is known.

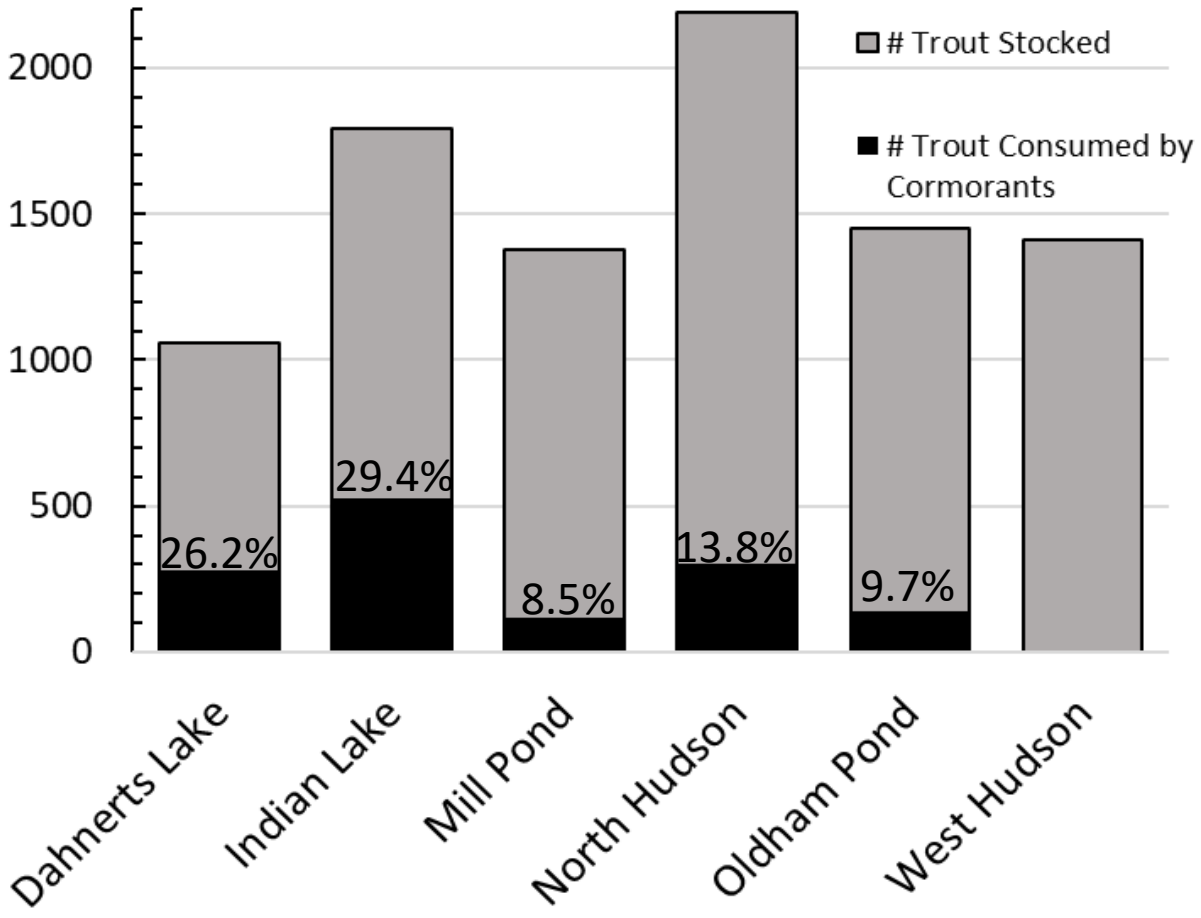


How much did cormorants use trout-stocked ponds during the preseason period?



- **Similar trend of a mass arrival and departure across all ponds**
- **Cormorant numbers were decreasing by week prior to Opening Day**
- **Migrating flock? Or resource depletion?**

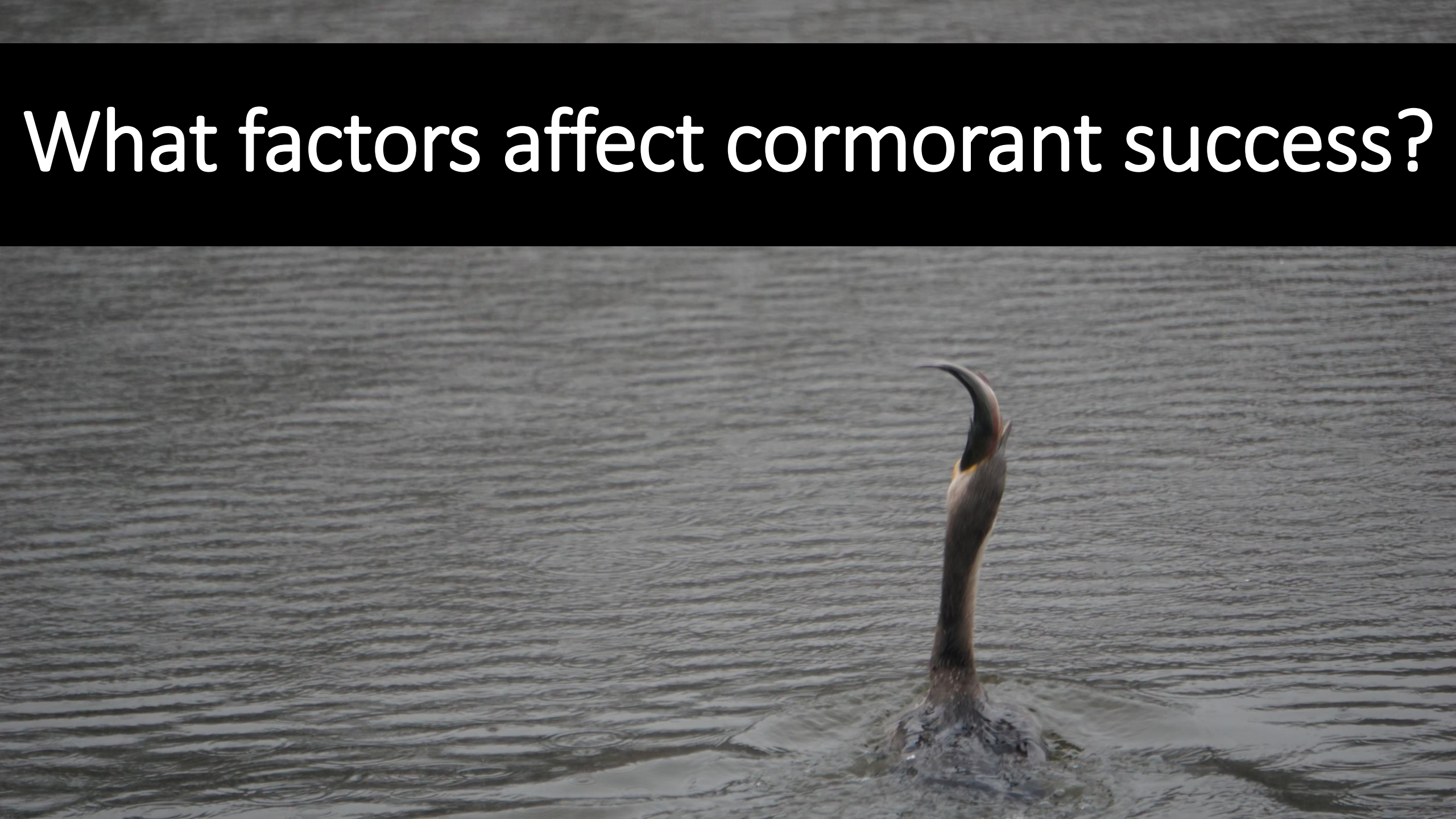
How many fish were consumed by cormorants?



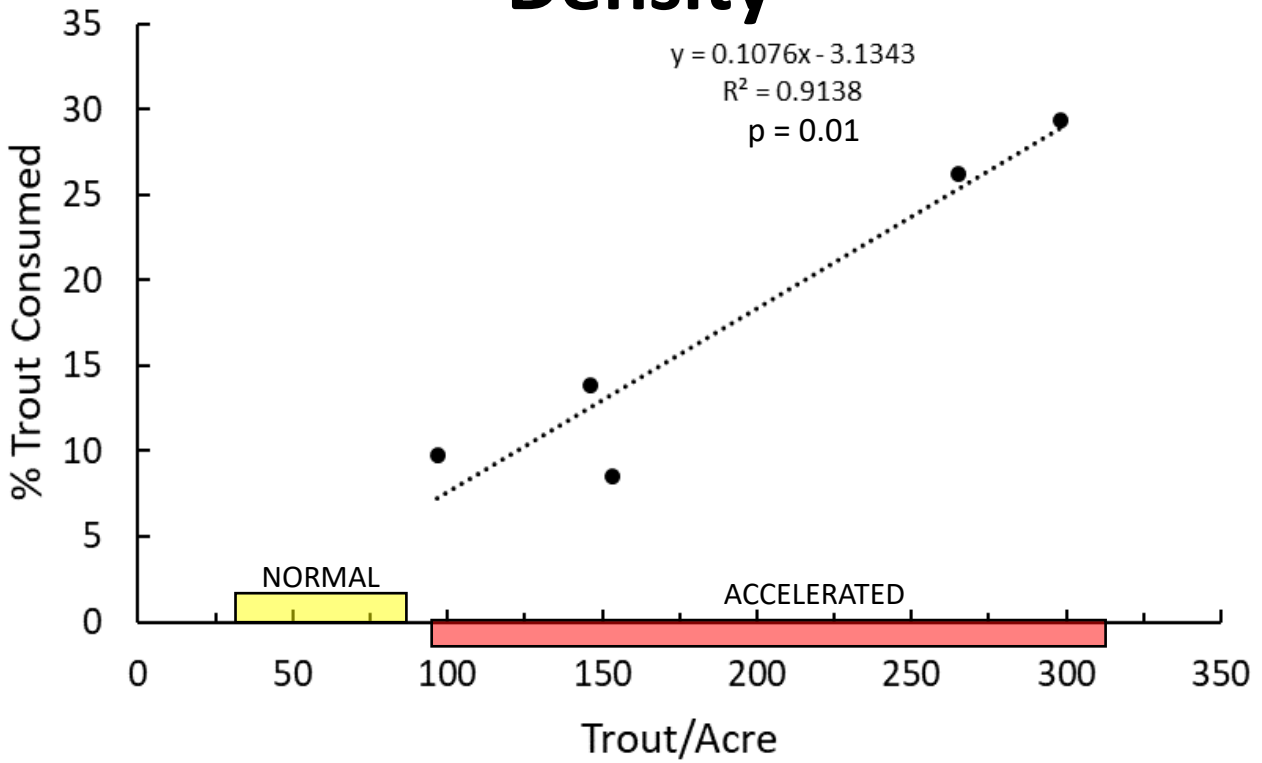
>70% of trout survived 4 weeks of predation until Opening Day

*Accelerated stocking caused higher number of fish to be present preseason for longer period than normal **(4 weeks)**

What factors affect cormorant success?



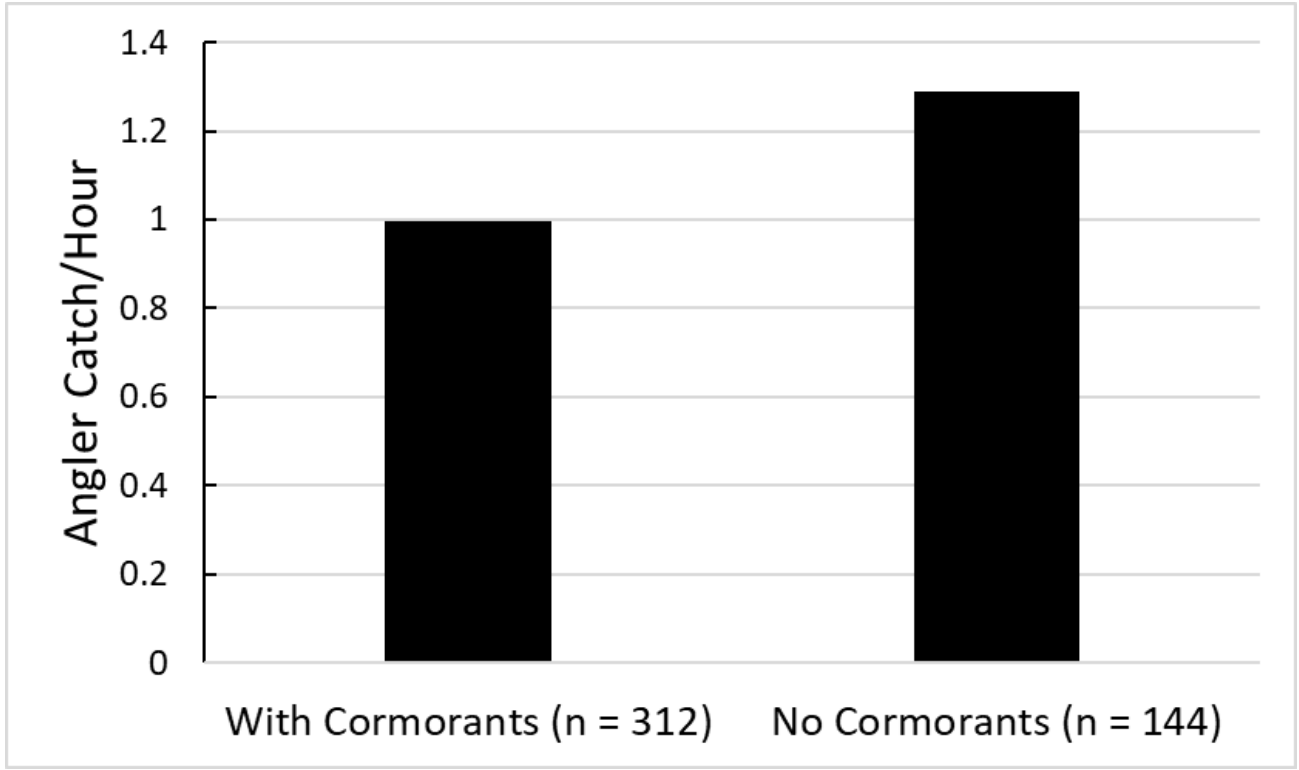
Density



*Accelerated stocking caused much higher densities of fish to be present during preseason than would normally be. Normal densities for these locations would be **29-88 trout/acre.**

Cormorants ate more fish when densities were high.

How do cormorants impact fishing success?



N = Number of hours anglers spent fishing

- **Despite the visual decrease on the graph, statistical analyses were unable to draw a definite conclusion on if cormorants were what affected success.**
- **Cormorants likely affect success, but this study's findings were unable to confirm this.**

Cormorant Management Considerations

Bonus Broodstock

Closer to Opening Day

Vs.

In-Season Stockings

Preseason Estimated Losses

*Estimates based on stocking 4 weeks before Opening Day, stocking ponds during last week will further reduce this loss.

2019	2021	2022
Normal	Accelerated	Semi-Normal
0-6.3%	**8.5-29%**	**1.5-10%**

What's Being Done in 2022?

- Cormorants will be counted at 10 waterbodies across the state from the preseason closure into the in-season stocking period (7 total weeks)
- Will help us to better understand cormorant usage during the open fishing season

Summary

- Cormorants are a known issue, and NJFW is continuing to monitor their impact and assess potential solutions.
- Density of trout stocked was a major factor in predicting cormorant predation.
- Unfortunate timing of study leads to uncertainties of impacts to normal schedule, however returning to normal should reduce trout losses below what was seen in this study.
- Even in a perfect scenario for cormorants, the majority of fish stocked were still available on Opening Day.

Questions?