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# Experimental Early Teal Season Evaluation

Harvest Survey Report

12/16/2021

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## Suggested citation

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## Contact information

Adam Landon. Ph.D.  
Conservation Social Scientist  
Fish and Wildlife Division  
Minnesota Department of Natural Resources  
Email: [Adam.Landon@state.mn.us](mailto:Adam.Landon@state.mn.us)  
Phone: 651-259-5183

# Contents

- Experimental Early Teal Season Evaluation.....1
- Background and study purpose.....1
- Methods .....1
- Sampling and data collection .....1
- Response rate .....1
- Table 2. Study response rate, undeliverable mail, and number of respondents .....1
- Weighting .....2
- Table 2. Weighting schedule .....2
- Mean estimates and confidence intervals .....2
- Results .....3
- Summary.....3
- Table 3. Proportion of Minnesota waterfowl stamp holders participating in the 2020 early teal season ....4
- Table 4. Mean days hunted per hunter during the 2021 early teal season .....5
- Table 5. Mean total teal harvested per hunter during in 2021 early teal season .....6
- Table 6. Estimated participation and harvest during the 2021 early teal season .....7
- Table 7. Percent of Minnesota teal hunters that reported shooting teal that were not retrieved, and the average number of birds during the 2021 early teal season.....8
- Table 8. Percent of Minnesota teal hunters that reported shooting non-target duck species during the early teal season, and the average number of birds during the 2021 early teal season .....9
- Table 9. Minnesota teal hunters’ reported difficulty identifying teal during the 2021 early teal season .. 10
- Table 10. Percent of Minnesota teal hunters primary hunting zone during the 2021 early teal season ... 11
- Table 11. Minnesota teal hunters’ overall satisfaction with the 2021 early teal season..... 12
- Table 12. Minnesota teal hunters’ satisfaction with elements of the 2021 early teal season ..... 13
- Table 13. Minnesota waterfowl hunters’ support for continuation of the early teal season..... 14

Appendix A. Survey questionnaire .....1

## Background and study purpose

The Minnesota DNR (MDNR) held an experimental season for blue-winged (*Spatula discors*) and green-winged teal (*Anas carolinensis*) (from here forward “teal”) from September 4 through September 8, 2021. Evaluating this season requires estimates of the number of individuals that participated in the hunt and their harvest. This report details the results of a post-season survey of waterfowl stamp holders intended to estimate participation, harvest, and users’ satisfaction with the experimental early teal season.

## Methods

### Sampling and data collection

We drew a simple random sample of 2,400 individuals from the Minnesota Electronic Licensing System, among those that possessed a waterfowl hunting stamp as of September 9, 2021. At the time of sample, 38,718 individuals aged 18+ were in possession of a waterfowl hunting stamp. This represents the potential set of teal season participants in Minnesota. The sample size exceeded the number of responses necessary to estimate population parameters with 95% confidence, given the size of the population, with a margin of +/- 4%, at an anticipated response rate of 33%.

We solicited responses using a repeat mail design with three points of contact. All participants received a letter inviting them to complete a questionnaire online. Non-respondents received a second letter again directing them to complete a questionnaire online. Finally, individuals that did not respond online after the first two requests received a paper copy of the questionnaire, and a postage-paid, self-addressed, business reply envelope for which to return their completed questionnaire. Data collection occurred from late September to early December 2021.

### Response rate

At study close, 945 hunters completed the questionnaire either online or through the mail. A further 60 pieces of mail were returned undeliverable. After removing undeliverable cases from the sample, this represents an effective response rate of 40% (Table 1).

Table 1. Study response rate, undeliverable mail, and number of respondents

| Initial Sample | Undeliverable | Respondents | Adjusted sample | Raw response rate | Adjusted response rate |
|----------------|---------------|-------------|-----------------|-------------------|------------------------|
| 2,400          | 60            | 945         | 2,340           | .39               | .40                    |

## Weighting

We weighted results according to proportional representation of respondents versus the population of waterfowl stamp holders by age. Table 2 contains a summary of weights applied to the data to make representative estimates at the population level.

Table 2. Weighting schedule

| Weight Category | Population # | Population % | Respondent # | Respondent % | Weight |
|-----------------|--------------|--------------|--------------|--------------|--------|
| 18-28           | 10254        | .2648        | 114          | .1206        | 2.1956 |
| 29-39           | 9265         | .2393        | 201          | .2127        | 1.1251 |
| 40-55           | 9586         | .2476        | 251          | .2656        | 0.9322 |
| 55+             | 9613         | .2483        | 379          | .4011        | 0.6190 |

## Mean estimates and confidence intervals

Estimates for the proportion of hunters participating in the season, total number of days spent hunting, and total teal harvested are the means of the respondents, weighted for age according to the population. We calculated 95% confidence intervals for these estimates using Equation 1:

Equation 1.  $CI = \mu \pm Z_{\alpha/2} * \left(\frac{s}{\sqrt{n}}\right) * \sqrt{FPC}$

Where:

$CI$  = Confidence interval

$\mu$  = mean

$Z$  = critical value of the normal distribution at 95% confidence

$s$  = sample size

$n$  = population size

$FPC$  = finite population correction

## Results

### Summary

An estimated 34% of Minnesota waterfowl stamp holders (as of September 9, 2021) reported participating in the experimental early teal season (Table 3). Teal season participants reported hunting an average of 1.85 days (Table 4), and harvesting an average of 3.82 teal per person (Table 5), or 2.07 teal per person per day (Table 6).

Assuming a 34% participation rate, we estimate 13,292 Minnesota waterfowl stamp holders participated in the experimental early teal season in 2021. At an average of 1.85 days afield, teal season hunters logged 24,590 hunt days. Assuming a mean harvest of 2.07 teal per person per day, we estimate that hunters harvested 50,901 teal during the experimental early teal season (Table 6). We also estimated blue-winged teal and green-winged teal separately. Blue-winged teal accounted for roughly 84% of the total harvest at 42,541 birds, and green-winged teal accounted for roughly 16% at an estimated 8,361 birds (Table 6).

Hunters reported if they crippled teal and were unable to retrieve them, and if they killed any non-target waterfowl species (e.g., wood duck). An estimated 13% of waterfowl hunters reported crippling birds and not retrieving them. Among hunters reporting they crippled birds, hunters reported an average of 2.1 teal per person during the experimental early teal season (Table 7). Less than 5% of hunters reported killing non-target species during the experimental early teal season, at an average of 1.6 birds per person over the season (among those reporting having killed non-target species) (Table 8). Readers should interpret estimates of reported take of non-target species with caution given the potential for strategic response to a question about an illegal activity.

Hunters reported the relative difficulty they experienced identifying teal while hunting, and the waterfowl hunting zone where they primarily hunted during the experimental early teal season. A majority (65%) of teal hunters reported that identifying teal was either slightly, moderately, or very easy (Table 9). A slight majority of teal hunters reported hunting in the central waterfowl hunting zone (51%), and the remainder relatively evenly split between the north zone (24%) and the south zone (26%) (Table 10).

Overall satisfaction with the experimental early teal season was very high among participants. Roughly 70 percent of participants reported feeling either slightly, moderately, or very satisfied with their overall teal hunting experience, and 40% were very satisfied (Table 11). A minority of participants reported feeling either very (9%), moderately (6%), or slightly (6%) dissatisfied with their overall teal hunting experience, and 11% reported neutrality (Table 11). Hunters also reported their satisfaction with elements of the experimental early teal season (Table 12). A similarly small proportion of hunters reported dissatisfaction with these elements.

Finally, all respondents, regardless of their participation in the experimental early teal season reported their support for continuing the season in 2022. A narrow majority of respondents (51%) reported either slight, moderate, or strong support for continuing the experimental early teal season. Roughly, a third (32%) of respondents reported either slight, moderate, or strong opposition to continuing the season, and 19% reported strong opposition. A further 17% were neutral on the issue (Table 13).

*Table 3. Proportion of Minnesota waterfowl stamp holders participating in the 2020 early teal season*

|  | <b>Proportion hunted</b> |
|--|--------------------------|
| Minnesota held an experimental early teal hunting season from September 4 to September 8 2021. Did you hunt teal during this season? | .34 [.31, .37]           |

- $n = 941$
- [95% Confidence interval]



*Table 4. Mean days hunted per hunter during the 2021 early teal season*

|                             | <b>Mean</b>       |
|-----------------------------|-------------------|
| Mean days hunted per hunter | 1.85 [1.79, 1.91] |

- $n = 273$
- [95% Confidence interval]

*Table 5. Mean total teal harvested per hunter during in 2021 early teal season*

|                                | <b>Mean</b>       |
|--------------------------------|-------------------|
| Mean teal harvested per hunter | 3.82 [3.53, 4.01] |

- Values exceeding 30 birds recorded as missing since this exceeded the legal daily bag across the season
- $n = 275$
- [95% Confidence interval]

*Table 6. Estimated participation and harvest during the 2021 early teal season*

|                           | <b>Mean days per hunter</b> | <b>Mean harvest per hunter</b> | <b>Mean harvest per hunter per day</b> | <b>Total participants</b> | <b>Total days hunted</b> | <b>Total teal harvest</b> |
|---------------------------|-----------------------------|--------------------------------|--|---------------------------|--------------------------|---------------------------|
| Total teal harvest        | 1.85                        | 3.82                           | 2.07                                   | 13,292                    | 24,590                   | 50,901                    |
| Blue-winged teal harvest  | 1.85                        | 3.20                           | 1.73                                   | 13,292                    | 24,590                   | 42,541                    |
| Green-winged teal harvest | 1.85                        | 0.62                           | 0.34                                   | 13,292                    | 24,590                   | 8,361                     |

- Values are an extrapolation of the mean value of the total number of days hunted, the total teal harvested, and proportion of waterfowl stamp holders participating in the teal season.

*Table 7. Percent of Minnesota teal hunters that reported shooting teal that were not retrieved, and the average number of birds during the 2021 early teal season*

|   | <b>Percent yes</b> | <b>Average</b> |
|---|--------------------|----------------|
| Did you personally shoot any teal that you were not able to retrieve during the 2021 experimental early teal season in Minnesota? | 13                 | 2.1            |

- Responses from teal season participants only
- $n = 284$

*Table 8. Percent of Minnesota teal hunters that reported shooting non-target duck species during the early teal season, and the average number of birds during the 2021 early teal season*

|  | <b>Percent yes</b> | <b>Average</b> |
|--|--------------------|----------------|
| Did you personally shoot any non-teal ducks during the 2021 experimental early teal season in Minnesota? | 4                  | 1.6            |

- Responses from teal season participants only
- $n = 284$

Table 9. Minnesota teal hunters' reported difficulty identifying teal during the 2021 early teal season

| Very difficult | Moderately difficult | Slightly difficult | Not easy or difficult | Slightly easy | Moderately easy | Very easy |
|----------------|----------------------|--------------------|-----------------------|---------------|-----------------|-----------|
| 3              | 8                    | 12                 | 13                    | 10            | 26              | 29        |

- Question wording: *How easy or difficult was it for you to accurately identify teal compared to other waterfowl species that cannot be legally harvested during the experimental early teal hunting season; for instance, wood duck?*
- Responses from teal season participants only
- $n = 281$

Table 10. Percent of Minnesota teal hunters primary hunting zone during the 2021 early teal season

|   | North | Central | South |
|---|-------|---------|-------|
| <i>Which waterfowl-hunting zone did you primarily hunt during the 2021 experimental teal hunting season in Minnesota?</i> | 24    | 51      | 26    |

- Responses from teal season participants only
- $n = 283$

Table 11. Minnesota teal hunters' overall satisfaction with the 2021 early teal season

| Very dissatisfied | Moderately dissatisfied | Slightly dissatisfied | Neither | Slightly satisfied | Moderately satisfied | Very satisfied |
|-------------------|-------------------------|-----------------------|---------|--------------------|----------------------|----------------|
| 9                 | 6                       | 6                     | 11      | 11                 | 18                   | 40             |

- Question wording: *Overall, how satisfied were you with your experience during the experimental early teal hunting season?*
- Responses from teal season participants only
- $n = 282$



Table 12. Minnesota teal hunters' satisfaction with elements of the 2021 early teal season

|  | Very dissatisfied | Moderately dissatisfied | Slightly dissatisfied | Neither | Slightly satisfied | Moderately satisfied | Very satisfied |
|--|-------------------|-------------------------|-----------------------|---------|--------------------|----------------------|----------------|
| Teal harvest   | 12                | 7                       | 12                    | 15      | 14                 | 14                   | 28             |
| Number of teal seen while hunting  | 10                | 9                       | 15                    | 9       | 12                 | 20                   | 26             |
| Number of other hunters encountered  | 6                 | 5                       | 7                     | 36      | 12                 | 15                   | 19             |
| Teal hunting regulations   | 6                 | 2                       | 10                    | 20      | 12                 | 20                   | 31             |
| Timing of the teal hunting season  | 10                | 5                       | 6                     | 15      | 13                 | 20                   | 31             |
| Length of the teal season  | 8                 | 5                       | 12                    | 25      | 14                 | 20                   | 16             |
| Number of non-hunters (e.g., wild rice harvesters, kayakers) encountered while hunting | 5                 | 6                       | 4                     | 42      | 6                  | 11                   | 28             |
| Access to places to hunt teal  | 3                 | 5                       | 5                     | 21      | 13                 | 23                   | 30             |

- Question wording: *How satisfied or dissatisfied were you with the following elements of the experimental early teal season in Minnesota in 2021?*
- Responses from teal season participants only
- $n = 280, 282, 282, 280, 281, 282, 280, 282$  (in order top to bottom)

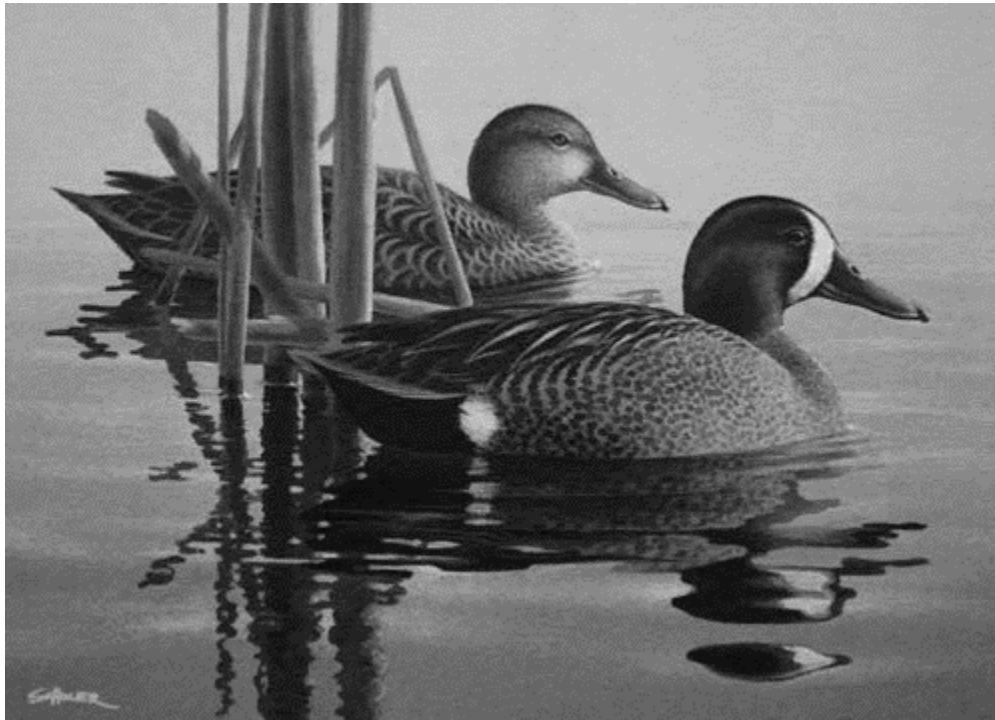
Table 13. Minnesota waterfowl hunters' support for continuation of the early teal season

| Strongly oppose | Moderately oppose | Slightly oppose | Neither | Slightly support | Moderately support | Strongly support |
|-----------------|-------------------|-----------------|---------|------------------|--------------------|------------------|
| 19              | 8                 | 5               | 17      | 6                | 15                 | 30               |

- Question wording: *How much do you support or oppose Minnesota DNR offering an early teal season in 2022?*
- Responses are for all respondents regardless of teal season participation
- $n = 935$

# THE 2021 EXPERIMENTAL EARLY TEAL SEASON IN MINNESOTA

A study of hunters' opinions and activities



**Your help on this study is greatly appreciated!**

**PLEASE COMPLETE EVEN IF YOU DID NOT HUNT**

*Please return your completed questionnaire in the enclosed envelope. The envelope is self-addressed and no postage is required. Thanks!*

**m** DEPARTMENT OF  
NATURAL RESOURCES

Minnesota Department of Natural Resources  
Fish and Wildlife Division  
500 Lafayette Rd.  
St. Paul, Minnesota 55155  
WaterfowlHunterSurvey.DNR@state.mn.us

{PIN}

[Title]

**Part I. Participation in the 2021 Experimental Early Teal Hunting Season**

**Q1. Minnesota held an experimental early teal hunting season from September 4 to September 8 2021. Did you hunt teal during this season?**

- No —→ *(Skip to Part IV.)*
- Yes

**Part II. Harvest during the 2021 Experimental Early Teal Season**

**Q2. For each of the 5 days of the experimental early teal hunting season, please report if you hunted that day, and the number of blue-winged and green-winged teal you killed. If you are unsure, please estimate as best you can.**

| Day   | Did you hunt this day?                                      | How many blue-winged teal did <u>YOU KILL PERSONALLY</u> on this day? | How many green-winged teal did <u>YOU KILL PERSONALLY</u> on this day? |
|---|---|---|--|
| Saturday, September 4 <sup>th</sup> , 2021  | <input type="checkbox"/> Yes<br><input type="checkbox"/> No |   |  |
| Sunday, September 5 <sup>th</sup> , 2021    | <input type="checkbox"/> Yes<br><input type="checkbox"/> No |   |  |
| Monday, September 6 <sup>th</sup> , 2021    | <input type="checkbox"/> Yes<br><input type="checkbox"/> No |   |  |
| Tuesday, September 7 <sup>th</sup> , 2021   | <input type="checkbox"/> Yes<br><input type="checkbox"/> No |   |  |
| Wednesday, September 8 <sup>th</sup> , 2021 | <input type="checkbox"/> Yes<br><input type="checkbox"/> No |   |  |

**Q3. Did you personally shoot any teal that you were not able to retrieve during the 2021 experimental early teal season in Minnesota?**

- No
- Yes (If, yes, how many over the whole 5-day season?) \_\_\_\_\_

**Q4. Did you personally shoot any non-teal ducks during the 2021 experimental early teal season in Minnesota?**

- No
- Yes (If, yes, how many over the whole 5-day season?) \_\_\_\_\_

**Q5. How easy or difficult was it for you to accurately identify teal compared to other waterfowl species that cannot be legally harvested during the experimental early teal hunting season; for instance, wood duck. *(Please circle one.)***

| Very difficult | Moderately difficult | Slightly difficult | Not easy or difficult | Slightly easy | Moderately easy | Very easy |
|----------------|----------------------|--------------------|-----------------------|---------------|-----------------|-----------|
| 1              | 2                    | 3                  | 4                     | 5             | 6               | 7         |

**Q6. Which waterfowl hunting zone did you primarily hunt during the 2021 experimental teal hunting season in Minnesota? (Please choose only one).**

- North
- Central
- South

**Part III. Your Teal Hunting Satisfaction**

**Q7. Overall, how satisfied were you with your experience during the experimental early teal hunting season? (Please circle one.)**

| Very dissatisfied | Moderately dissatisfied | Slightly dissatisfied | Neither | Slightly satisfied | Moderately satisfied | Very satisfied |
|-------------------|-------------------------|-----------------------|---------|--------------------|----------------------|----------------|
| 1                 | 2                       | 3                     | 4       | 5                  | 6                    | 7              |

**Q8. How satisfied or dissatisfied were you with the following elements of the experimental early teal season in Minnesota in 2021? (Please circle one for each).**

|  | Very dissatisfied | Moderately dissatisfied | Slightly dissatisfied | Neither | Slightly satisfied | Moderately satisfied | Very satisfied |
|--|-------------------|-------------------------|-----------------------|---------|--------------------|----------------------|----------------|
| Teal harvest   | 1                 | 2                       | 3                     | 4       | 5                  | 6                    | 7              |
| Number of teal seen while hunting  | 1                 | 2                       | 3                     | 4       | 5                  | 6                    | 7              |
| Number of other hunters encountered  | 1                 | 2                       | 3                     | 4       | 5                  | 6                    | 7              |
| Teal hunting regulations   | 1                 | 2                       | 3                     | 4       | 5                  | 6                    | 7              |
| Timing of the teal hunting season  | 1                 | 2                       | 3                     | 4       | 5                  | 6                    | 7              |
| Length of the teal season  | 1                 | 2                       | 3                     | 4       | 5                  | 6                    | 7              |
| Number of non-hunters (e.g., wild rice harvesters, kayakers) encountered while hunting | 1                 | 2                       | 3                     | 4       | 5                  | 6                    | 7              |
| Access to places to hunt teal  | 1                 | 2                       | 3                     | 4       | 5                  | 6                    | 7              |

**Part IV. Support for Teal Hunting Season**

**Q9. How much do you support or oppose Minnesota DNR offering an early teal season in 2022? (Please circle one.)**

| Strongly oppose | Moderately oppose | Slightly oppose | Neither | Slightly support | Moderately support | Strongly support |
|-----------------|-------------------|-----------------|---------|------------------|--------------------|------------------|
| 1               | 2                 | 3               | 4       | 5                | 6                  | 7                |