

Photo by: Deb Johnston

Wood Duck Nesting Box Report 2016

Hullett Provincial Wildlife Area

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INTRODUCTION

Wood duck habitat consists of swamps, wetlands and marshes, which are abundant with trees, woody debris, and/or cattails. As the wood duck is a cavity nester, mounting large nesting boxes around these habitats helps increase possible nesting locations for wood duck hens in the spring (Cornell University 2015).

Wood duck nesting boxes are commonly built out of rough cut lumber to allow the ducklings to climb out using their claws, with layer several inches thick of shavings inside (Ducks Unlimited n.d.). Although duck boxes are raised on poles preferably 10 feet in height in or near water, securing an additional sheet metal predator guard to the post can help prevent predation to the hen and her nest (Ducks Unlimited n.d.).

METHODS AND MATERIALS

Duck boxes have been installed throughout Hullett Marsh in all of the pools and most of the satellite ponds, where suitable habitat was found. Boxes range from 0-3 feet high, to over 10 feet, some poles with sheet metal predator guards and some without. Boxes are cleaned annually, and a thick layer of fresh shavings are added in preparation for the next nesting season. Annual data collection began in 2001, which includes: latitude and longitude, pond location, box height, presence of a predator guard, condition of box and guard, waterfowl usage and species, other species usage, nesting outcome, number of hatched and unhatched eggs, date cleaned, data collectors, and additional comments. All data is maintained within the ArcGIS Suite computer software. Boxes are wooden with a roughed interior or small metal cage wire attached to allow ducklings to climb out.

The first box from the 2016 nesting season was cleaned on August 31, 2016, and the last box was cleaned on March 9, 2017. Boxes are accessed primarily by snowmobile in the winter, although several boxes were accessed by foot. Data from the 2016 nesting season was collected from 145 wood duck boxes within the marsh by 10 individuals in various teams, always including at least one knowledgeable and experienced person to determine usage, species, and nesting outcome within the box, which helped to reduce error in data collection. Successful hatches were determined by the number of shell membranes in the nest, predation by small shell fragments, abandoned by whole eggs still in the nest, and unknown was used when the success could not be determined accurately. Hooded merganser and wood duck nests were differentiated by the thickness of leftover shells in a nest, colour of shell, or a combination. Data collection sheets were designed by Ducks Unlimited (Appendix I), and continue to be used to develop consistency. After field data collection, the FOH wildlife and GIS technician inputted all data to the attribute table for each box in ArcGIS.

RESULTS

A total of 145 duck boxes were present for the 2016 nesting season. Of these 145 boxes, 67 boxes had no waterfowl usage, and 78 showed signs of waterfowl nesting— 57% of boxes were used by waterfowl. Of the used boxes, waterfowl nests were successful, abandoned, predated, unknown, or a combination of these outcomes. Figure 1 shows the percentage of boxes per outcome. Abandoned eggs were found in 30% of boxes, membranes were found in 10% of boxes, egg shell fragments in 9%, and 8% were too difficult to determine the success accurately.

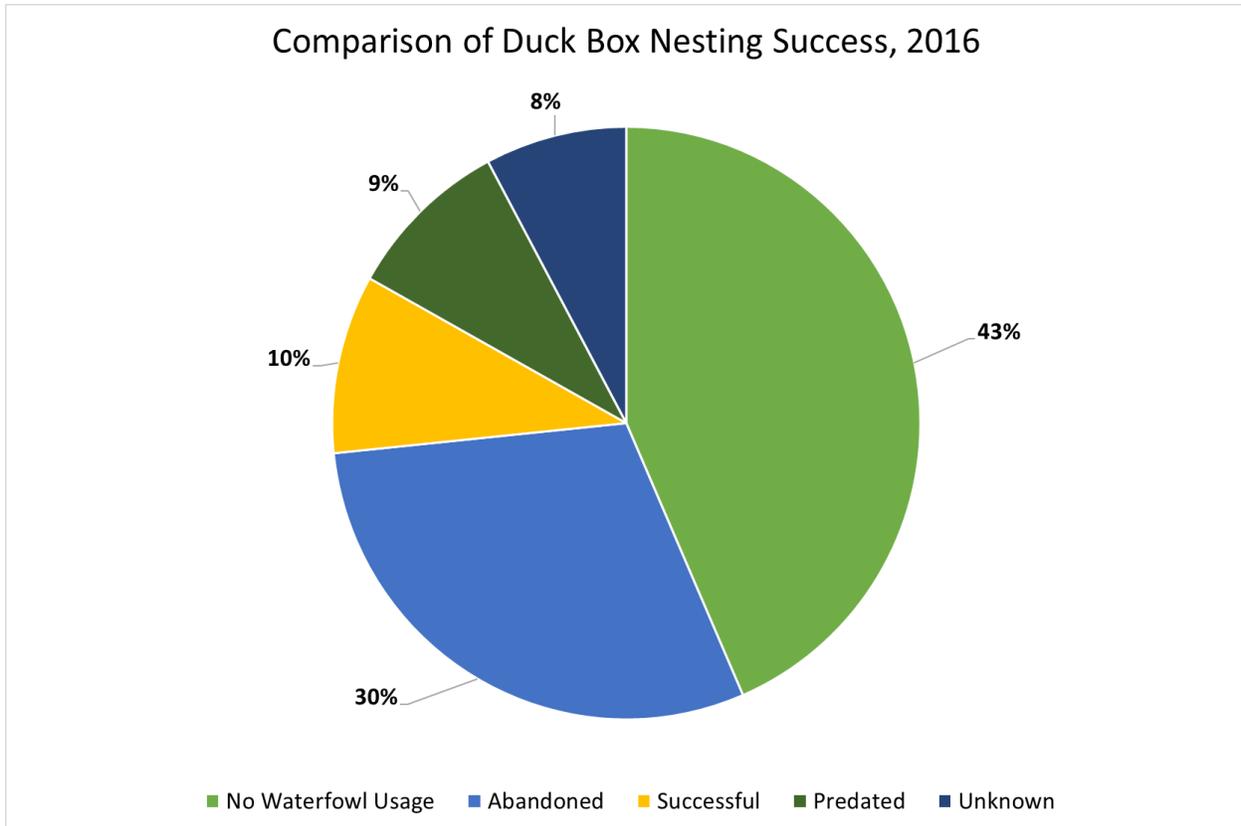


Figure 1. Nest success as percentages of the 145 wood duck nesting structures at Hullett Marsh in 2016.

The nests of only two species of waterfowl were found in duck boxes in 2016; these species were wood ducks and hooded mergansers. Figure 2 shows a comparison of the use of these species among boxes identified in having waterfowl use. Hooded mergansers are the main users of the nesting structures, as the species occupied 64% of used boxes. Wood ducks nested in 26% of the used boxes and 10% had features identifying use by both species within the same box.

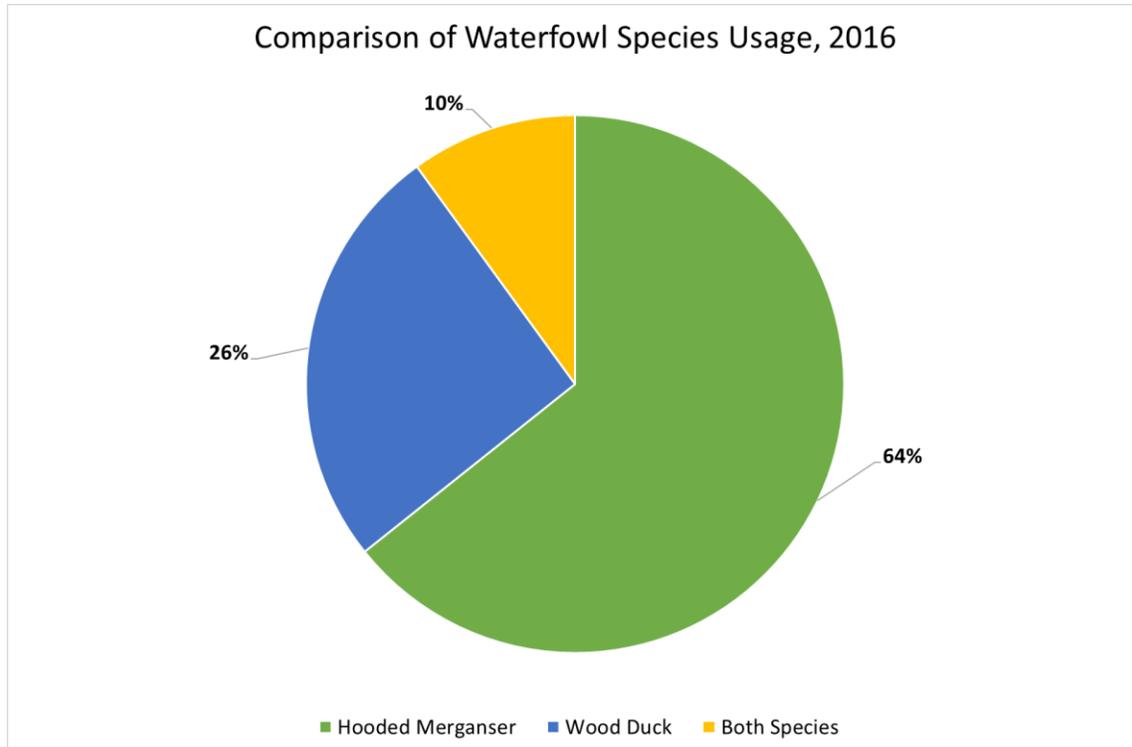


Figure 2. Comparison of waterfowl species' usage identified from occupied boxes in 2016.

To analyze waterfowl usage further, Figure 3 compares the success of hooded merganser and wood duck nests. A total of 479 abandoned and successful waterfowl eggs were discovered from the 2016 season. Predated eggs are not included in this value, as egg shell fragments can not accurately determine the number of eggs that were laid. Although hooded mergansers were the dominant waterfowl species within the nesting boxes, only 6.6% of the 338 hooded merganser eggs were found to have hatched, which were categorized as successful. A total of 141 wood duck eggs were found in the duck boxes, and 48.4% of these eggs were successful. Data labels in Figure 3 indicate the total number of eggs for each category—21 hooded merganser eggs and 46 wood duck eggs were hatched successfully, which provides a 16.3% success rate for waterfowl in the 2016 nesting season.

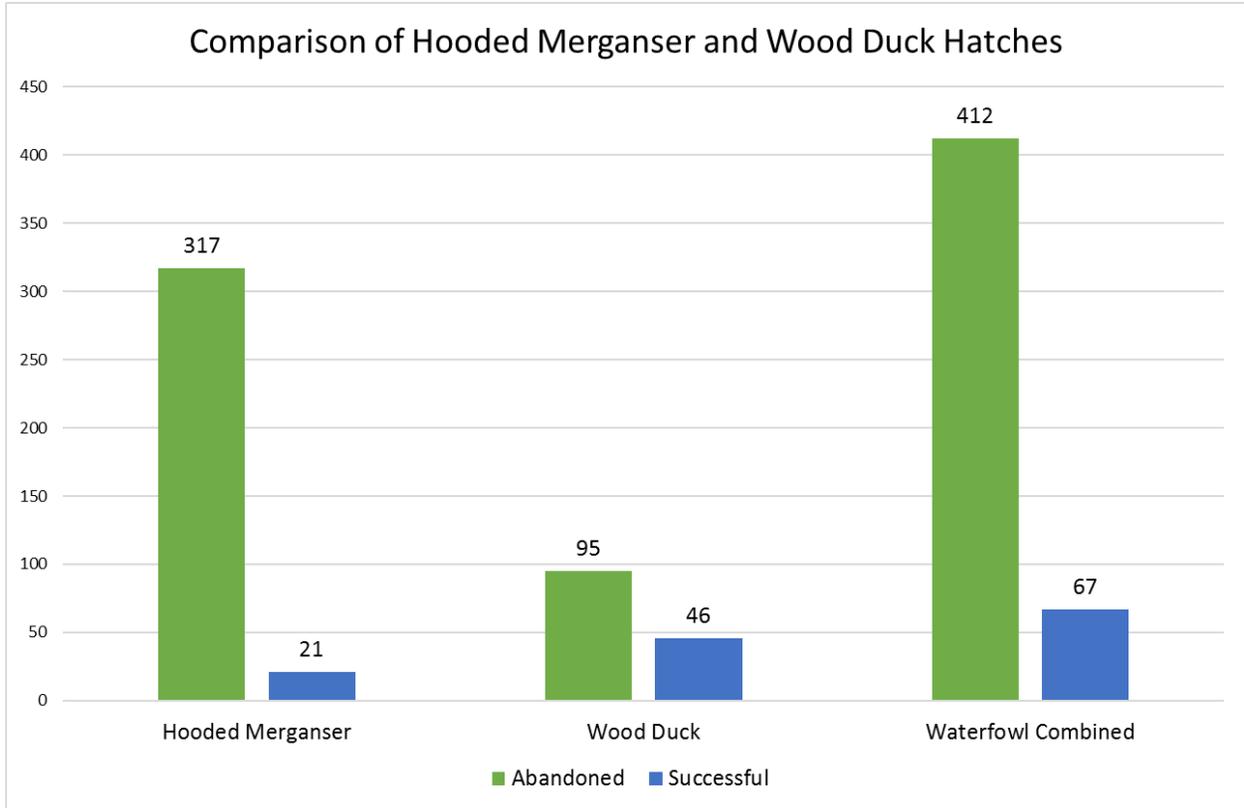


Figure 3. Comparison between the number of abandoned and successful waterfowl eggs in the 2016 nesting season.

Although the nesting boxes are intended for wood ducks, many other species occupied the space in the 2016 season— 43% of boxes had usage from animals other than waterfowl or no usage, as previously shown in Figure 1. As shown in Figure 4, these species included common grackle, screech owl, mouse, great crested flycatcher, squirrel, raccoon, and unknown when usage was obvious but species could not be determined with accuracy.

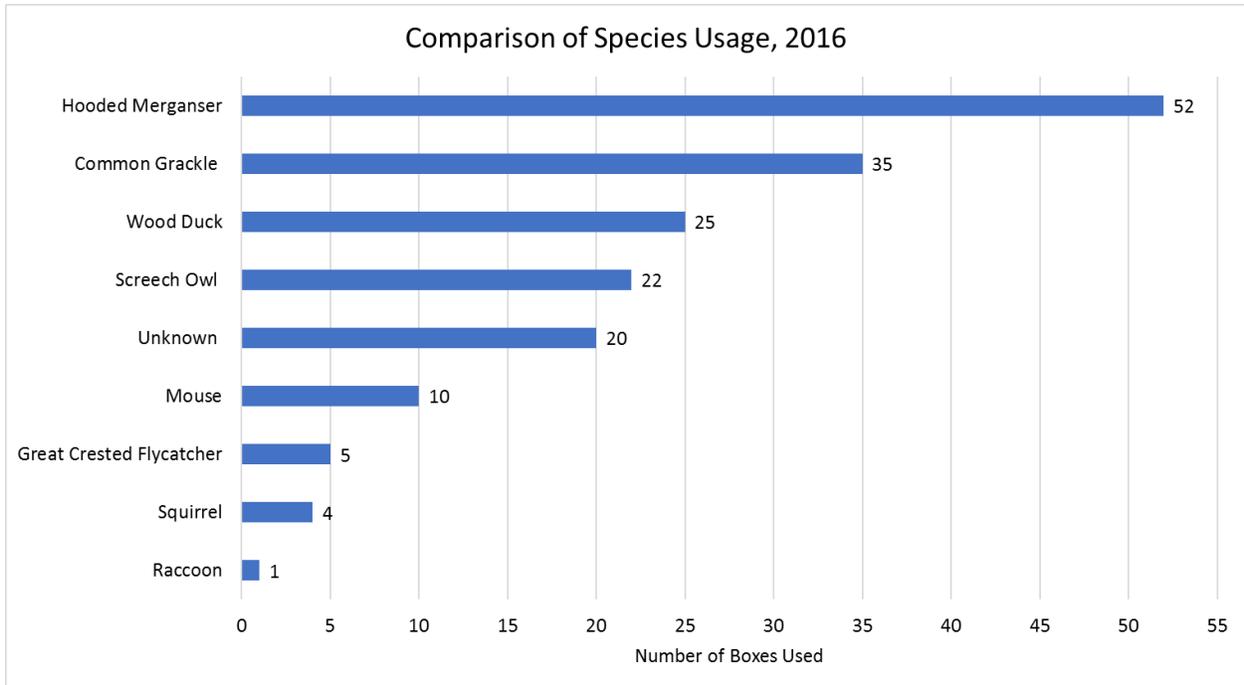


Figure 4. Comparison of the number of boxes occupied by various species in the 2016 nesting season.

DISCUSSION

The wood duck box program at Hullett Marsh has proven successful for providing artificial cavities for nesting waterfowl. With 145 boxes throughout the marsh, the 2016 nesting season saw an grand average of 3.3 duck eggs laid per box. This program saw 46 wood duck ducklings and 21 hooded merganser ducklings hatched successfully in 2016. Another 412 wood duck and hooded merganser eggs were abandoned, which could be due to numerous reasons. Eggs may be abandoned do to predation on the hen while she's away from the nest, or other species such as starlings may begin to defend the box as their own, which may cause the eggs to cool to temperature too low for hatching (WDS n.d.). The eggs may also be infertile, as eggs are laid about daily before the hen incubates them (WDS n.d.). Several boxes had no waterfowl usage, which may be due to poor box conditions or poor location, as the habitat may be unfavourable.

CONCLUSION

Friends of Hullett hope to improve the duck box program by removing boxes in poor conditions or poor habitats, and installing new boxes in favourable areas. By collecting data annually, more research and analysis into which boxes should be removed or relocated can occur, and hopefully improve the number of successful waterfowl hatches throughout the marsh. With the data collected from 2004 through to 2016, a map of current duck boxes within the marsh was developed, which compares waterfowl nesting usage was developed alongside this report. Friends of Hullett hope to utilize the map and this report to create further nesting success.

ACKNOWLEDGEMENTS

Friends of Hullett relies heavily on volunteer efforts to successfully collect data from the wood duck boxes in the marsh. All assistance in collecting field data is greatly appreciated as well as for those who have helped remove and relocate boxes after the 2016 nesting season. Friends of Hullett thanks everyone for their continued effort and support each winter as we continue to collect wood duck box data and improve our program.

LITERATURE CITED

Cornell University. 2015. Wood Duck. https://www.allaboutbirds.org/guide/Wood_Duck/id.
March 21, 2017.

Ducks Unlimited. N.d. Wood Duck Boxes. <http://www.ducks.org/conservation/waterfowl-research-science/wood-duck-boxes>. March 22, 2017.

Wood Duck Society. N.d. Wood Duck Q&A.
[http://www.woodducksociety.com/qanda.htm#Unhatched Wood Duck Eggs](http://www.woodducksociety.com/qanda.htm#Unhatched_Wood_Duck_Eggs). May 23,
2017.

APPENDIX

APPENDIX I

BLANK DUCK BOX DATA COLLECTION SHEET AS DESIGNED BY DUCKS UNLIMITED



Ducks Unlimited Canada
2016 Breeding Year Nesting Structure Survey Card

Project Name and Number: Hullett: 8178 Pond ID: _____

Addressee: Scott Austin Inspection Date: ____/____/____
saustin Year / Month / Day

Nest Box ID	Waterfowl			Non-Waterfowl		Nest Box			NAD83 UTM Easting and Northing UTM Zone: 17 / 18 <small>(please circle one)</small>	Comments
	Usage	Species	Nesting Outcome	Usage	Species	Height of Box Bottom	Predator Guard Presence	Condition		
	Y - Yes N - No U - Unknown	W - Wood Duck H - Hooded Merganser G - Goldeneye U - Unknown	S - Successful P - Predated A - Abandoned U - Unknown	Y - Yes N - No U - Unknown		S - Submerged/Sunk/Fell A - Over 0 ft to 3 ft B - Over 3 ft to 6 ft C - Over 6 ft to 10 ft D - Over 10 ft U - Unknown	Y - Yes S - Yes, but submerged D - Yes, but damaged N - No U - Unknown	G - Good T - Tilted D - Damaged, usable X - Damaged, unusable M - Missing U - Unknown	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> E N	
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