

Wood Duck Nestbox Monitoring Report

Cache Creek Nature Preserve

2022



*A Wood Duck hen incubating a clutch of eggs while “looking” at the observer
Photo by Harnawaz Boparai*

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The Cache Creek Conservancy

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Introduction

The Cache Creek Conservancy (CCC) has performed restoration work in the lower Cache Creek Watershed for more than 25 years. During that time numerous different restoration methods have been utilized to restore the biodiversity in the watershed. One such method that is rather inexpensive and effective is installing nestboxes for breeding birds. Nestboxes are a great tool as they provide breeding habitat for cavity nesting birds that have limited natural cavities (in the form of tree limbs breaking and woodpecker excavated holes on trees) due to forest loss by human activities (like forest cuttings), but also floods, droughts, and wildfires. There are different types of nestboxes ranging from small nestboxes meant for cavity nesting songbirds to larger nestboxes meant for owls, other raptors and waterfowl.

Across the lower Cache Creek Watershed, numerous nestboxes have been established by both private landowners (such as farmers) and by environmental conservation groups (like Yolo Audubon Society and the Cache Creek Conservancy). Two locations in the lower Cache Creek watershed that have a notable number of nestboxes established are the Cache Creek Nature Preserve (hereafter CCNP) and Capay Open Space Park (hereafter COSP). These nestboxes were established to promote more native cavity nesting birds to breed in the lower Cache Creek Watershed. At the CCNP, there are several nestbox types established. There are currently 16 songbird nestboxes, 18 Wood Duck nestboxes, 6 Barn Owl nestboxes, and 1 flicker nestbox.

This paper specifically will be focusing on the Wood Duck nestboxes at CCNP during the 2022 breeding season. Past and present nestbox monitoring has shown Wood Ducks have used these nestboxes during the breeding season to incubate their eggs which hatch and often leave the nest after 24 hours of hatching.

Wood Ducks (*Aix sponsa*) are a common species of duck found in California. Their common name comes from their unique behavior to nest in wood and tree cavities rather than on the ground like most other ducks. Wood Ducks saw massive declines across North America during the 19th and early 20th centuries due to forest loss which led to fewer available nesting tree cavities (Bellrose 1976). Once wildlife and conservation laws were put in place, many nestboxes designed for Wood Ducks were installed throughout North America. As a result, Wood Ducks have made a significant recovery across the continent.

In 2021, CCC installed seven more nestboxes (prior to 2021, there were 12 Wood Duck nestboxes installed at CCNP) which increased breeding activity, but breeding success wasn't recorded for the 2021 breeding season. The objective of the 2022 Wood Duck nestbox program was to monitor the CCNP's Wood Duck boxes throughout the breeding season and measure breeding success and nestbox occupancy.

Materials and Methods

Calculating Wood Duck breeding success and nestbox occupancy was accomplished by monitoring the Wood Duck nestboxes on a consistent, regular basis. Wood Duck nestboxes were checked every week from late March 2022 to late July 2022. Checking every Wood Duck nestbox required specific steps. The first step was placing a camera into the hole of the box to take a photo and pull the camera out. The purpose was to see if a Wood Duck hen was inside incubating eggs. If there was a hen when checking the box, the observer(s) would leave the nestbox and record on the data sheet the

hen's presence; thus no nest measurements could be collected. If the photo showed no hen present inside the box when it was checked, observer(s) would proceed with opening the nestbox's roof, and feeling for eggs, ducklings, presence of feathers, and temperature of the eggs if possible. After collecting the data, the observer(s) would cover all the eggs present with loose shavings around the egg to aid the incubation process and move on to the next nestbox.

Wood Ducks can re-nest after their first clutch of the season has hatched. Whenever observers checked a nestbox that had a recent hatching event only to find new eggs, they would record on the nestbox data sheets the re-nesting attempt.

Whenever eggs failed to hatch, we removed those eggs and left them out at CCNP for scavengers and opportunists to consume. If dead ducklings were found in the nestbox, one of two actions would occur depending on the conditions of the dead ducklings. If the duckling recently died and its eyes were still intact, the duckling would be donated to the UC Davis Museum of Wildlife and Fish Biology. If the duckling was dead for a fair amount of time, eyes decomposed, and the body was more dry and flat (rather than fresh), we place the dead duckling out at CCNP as well for scavengers and opportunists to consume.

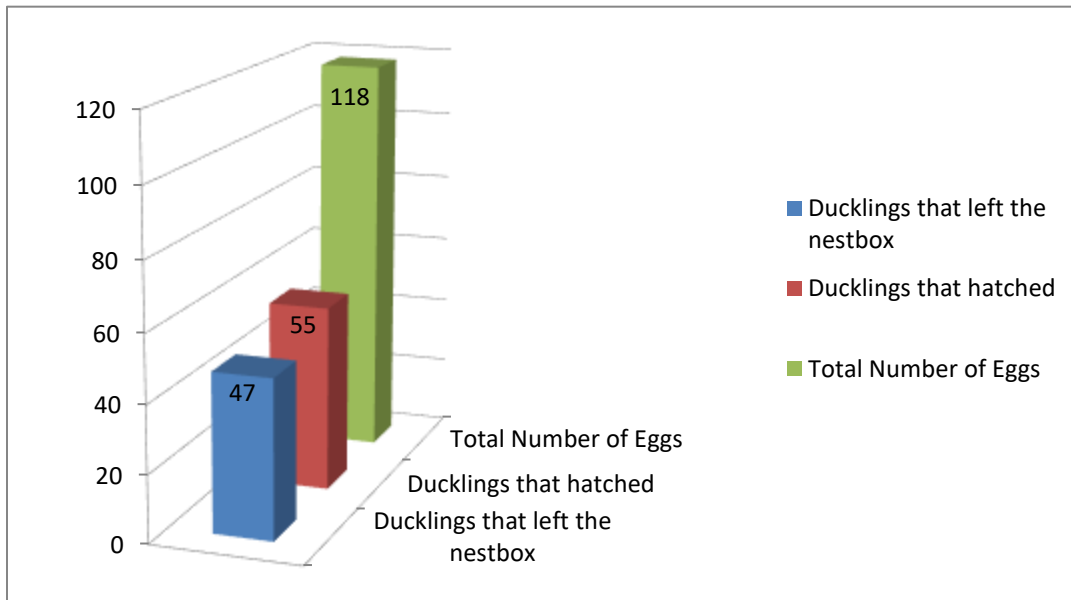
Lastly, a prescribed burn occurred at CCNP's wetland on April 28th under the supervision of both CCC and California Department of Forestry and Fire Protection (CalFire). The date of this prescribed burn happened within the breeding season of Wood Ducks; particularly during their first clutch attempts of the season. We checked all active nestboxes (in the burn plan area) immediately after the burn validating if the nests were abandoned or not. These specific nestboxes were continuously checked on their standard weekly schedule, and were noted for nest success and nest abandonment in case these factors were affected by the burn. (Photo of prescribed burn below courtesy of Harnawaz Boparai)



Results

From the 19 nestboxes, only 9 had nesting activity (an occupancy rate of 47.37 percent). Of those 9 nestboxes, 3 had re-nesting attempts (a re-nesting rate of 33.33 percent). The average clutch size for first season nests was 9.89 eggs per clutch. The average clutch size for re-nesting attempts was 9.67 eggs per clutch indicating no major change in egg production between different times of the breeding season.

Pooling both first nesting and re-nesting attempts, 9 of the 12 nests for the breeding season had at least one duckling leave the nestbox. In total, 118 Wood Ducks eggs were produced in 2022. From those 118 eggs, 55 hatched, and from those 55 ducklings, 47 successfully left the nestbox.



4 of the 19 nestboxes were in the area of the wetland burn on April 28th 2022. These were nestbox 12, nestbox 13, nestbox 14, and nestbox 8. Nestboxes 12, 13, and 14 are located on the northwest side of the wetland. Nestbox 8 was located on the southwest side of the wetland. Prior to the burn, all 4 nestboxes were sprayed with water and a fire line was established around the boxes to hinder the possibility of the fire damaging or destroying the boxes.

Nestboxes 12, 13, and 14 were not damaged during the prescribed burn. Nestboxes 12 and 14 both contained Wood Duck hens incubating their eggs at the time of the burn. One of CalFire's staff on site during the burn witnessed the hen from nestbox 12 flushing from the nestbox as the fire swept through. Nestbox 12 was checked immediately after the burn was finished. At the time, the hen did not return to the nestbox, but staff and interns monitored all the nestboxes on May 1st 2022 and found the hen from nestbox 12 returned and was incubating. The clutch she incubated was a clutch of 11 eggs from which 7 hatched and left the nestbox. The hen from nestbox 14 stayed inside the nestbox throughout the burn. Nestbox 14's hen was incubating 13 eggs from which one would hatch and leave the nestbox later in the season. Nestbox 13 contained no eggs or hens at the time of the burn.

Nestbox 8 was burned and destroyed from the wetland fire. The reason for this was neighboring riparian trees (such as cottonwoods and willows) caught on fire, and the flames reached the nestbox. At the time, there was one Wood Duck egg inside nestbox 8. However this egg received no incubation and

no hen sightings across all monitoring sessions prior to the burn. Likely, the egg was abandoned prior to the burn. On May 1st 2022, to compensate for losing nestbox 8, we relocated nestbox 13 to nestbox 8's location for the rest of the breeding season and for future breeding seasons.



*A Wood Duck Hen with one of her newly hatched ducklings from nestbox 10 in July 2022
Photo by Harnawaz Boparai*

Discussion

The overall nestbox occupancy for the 2022 breeding season was a moderate success. Having 9 of the 19 nestboxes occupied was expected due to the spacing of the nestboxes. Particularly, the northwest area of the wetland had 10 nestboxes spaced (at farthest) 60 feet apart from each other. However, it is recommended (from nestbox programs) to have Wood Duck nestboxes spaced at least

600 feet apart (NestWatch 2022). Territoriality is not a reason for this spacing. Wood Ducks are not territorial with one another unlike other cavity-nesting ducks (Eadie et al. 1998). The main reason is high-densities of Wood Duck nestboxes can lead to conspecific brood parasitism (Eadie et al. 2022). This means some Wood Duck hens will visit multiple nestboxes and lay eggs in some of those nestboxes. However, these select hens do not incubate the eggs they lay. Instead, other hens that invest in one nestbox for brooding will be incubating the brood parasite's eggs. Numerous studies over the last several decades support the claim that high densities of nestboxes in a given area promote conspecific brood parasitism in Wood Ducks.

The 10 nestboxes located at the northwest part of the wetland provide ideal conditions for conspecific brood parasitism. Likely most Wood Ducks that currently utilize CCNP for breeding are not obligate brood parasites. However, it is important to keep brood parasitism low as frequent parasitism will lead to low reproductive success in the host species from a population density perspective. Currently, the CCC has no equipment to quantify the presence and/or the frequency of brood parasitism at CCNP during the breeding season. However, it is likely for brood parasitism to reach CCNP as there are areas nearby in the county that already exhibit brood parasitism in their Wood Duck breeding populations such as Conaway Ranch (Odell and Eadie 2010).

Nestboxes 12 and 14 both contained incubating hens at the time of the prescribed burn, and both produced at least one duckling to successfully leave the nest later in the nesting season. There has not been much research done looking at prescribed burns affecting nesting success in Wood Ducks. But it can be concluded here that the prescribed burn on April 28th 2022 did not negatively impact the 2022 Wood Duck breeding season. This is a topic that can and should be researched in further detail.

Nest abandonment did occur, but not frequently. Only 3 nests were abandoned of the 12 from the season. Likely, these three were abandoned due to the receding water from both the Gordon Slough and the wetland. Both areas lost all their water by July 2022. However water did not completely recede from CCNP. Cache Creek (located at the south side of CCNP) still contained water by the end of the breeding season, and also witnessed occasional Wood Duck sightings. However no Wood Duck nestboxes are installed at the sighting locations on Cache Creek. These locations could prove to be ideal localities for future nestbox installations.

Conclusion and Recommendations

Overall, the 2022 Wood Duck breeding season at CCNP was a moderate success. However, considering the low occupancy rate and the receding water, it is recommended that CCC do not build and install new Wood Duck nestboxes at CCNP. Instead, CCC should practice adaptive management and relocate nestboxes that consistently receive no breeding activity every season. This is a practice that is already under way as two nestboxes from the northwest portion of the wetland (that received no breeding activity both in the 2021 and 2022 breeding seasons) were translocated to a slough on the northeast side of the preserve adjacent to the oak woodland (nestbox 5) and on the banks of Cache Creek to the southeast (nestbox 4).

Another recommendation is to relocate inactive nestboxes to sites that will have water available year around, and where Wood Ducks have been observed. Cache Creek on the south side of CCNP remains sparse with the number of nestboxes installed there with 2 nestboxes installed despite the sightings from this season.

The topic of prescribed burns affecting Wood Duck nesting success is still up for discussion and will only be solved with further studies and research designs.

Wood Duck nestboxes should not be installed in close proximity to other Wood Duck nestboxes to prevent high frequencies of conspecific brood parasitism. Perhaps once there are no further alternatives for adaptive relocation of nestboxes at CCNP, CCC should consider installing nestboxes at other locations in the lower Cache Creek watershed that contain water year-around.

Lastly, CCC should continue to regularly monitor Wood Duck nestboxes every breeding season on a weekly basis to see long term changes in Wood Duck breeding success, occupancy of nestboxes, nest abandonment, and so on.

Literature Cited

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