FINAL REPORT
TRANSLOCATION SIMULATION FOR THE SLENDER-BILLED WHITE-BREASTED NUTHATCH

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INTRODUCTION

Bird reintroductions are a viable option for conservation practitioners considering reestablishing bird populations in portions of their range from which they have disappeared. The reintroduction process exposes wild-captured individuals to many potentially stressful situations including: capture and handling at the donor site, transportation to the release site, and, in the case of soft releases, confinement for some period of time prior to release. Having protocols in place to ensure individuals are released in good condition is critical to the success of a reintroduction, yet we lack information on how many species of birds, particularly small landbirds, respond to handling and captivity. This is a problem because landbirds may be more vulnerable to stress under captive situations due to their high metabolism and small size. Through translocation simulations, conservation practitioners considering a reintroduction can evaluate a species response to handling and captivity in a safe and controlled environment prior to full implementation.

The Slender-billed White-breasted Nuthatch (*Sitta carolinensis aculatea*) was a common species in oak-prairie habitats of South Puget Sound, but is now extirpated. A feasibility assessment indicated that habitat is sufficient and of suitable quality to support a viable population (Slater and Altman 2006). This evaluation, along with recent successful reintroductions of Western Bluebird (*Sialia mexicana*) to nearby San Juan Island (Slater and Altman 2011) has stimulated interest in reintroducing this species. We conducted a translocation simulation study for the nuthatch, as there is no information on how the species responds to handling and captivity. The goal of the simulation was to field-test capture, translocation, and holding methods on two pairs of nuthatches in the Willamette Valley, a likely donor site for any full-scale reintroduction. If successful, the study would indicate the Slender-billed White-breasted Nuthatch as capable of handling the rigors of a translocation project

We modeled the translocation methods after the successful translocation of the Brown-headed Nuthatches (*Sitta pussila*), a congener of the Slender-billed White-breasted Nuthatch, in Florida (Lloyd et al. 2009). Each pair of nuthatches was exposed to all components of the translocation process, a 3 to 4 hour holding period in a small bird cage to simulate transport in a vehicle, and a captivity period of 3 to 4 days in an aviary. The simulation allowed us to continuously monitor the pair's condition and, if necessary, make modifications to the protocol if the health of the birds was in question, including release at the capture site.

METHODS

Trial simulations were conducted in the Willamette Valley, Oregon, a region where nuthatch populations are relatively large and stable. Capture sites were located on private lands in the Corvallis

region where known wintering territories of nuthatches were present. One week, prior to the capture period, we placed feeding stations provided with sunflower seed and suet blocks at capture sites. We captured pairs of nuthatches at feeding stations with the use of mist nets and call-playbacks.

Upon capture, pairs were placed in a small bird cage (50 x 50 x 50 cm), the kind commonly seen in pet stores, to simulate the initial transport to the proposed reintroduction site. The cage contained two perches and food (sunflower seeds and mealworms). We did not include water in the cage because in previous transport efforts with bluebirds and Brown-headed Nuthatches, bird's feathers frequently became wet when water was provided. This poses a thermoregulatory risk that we did not want to experience. The food sources, especially mealworms, contain high water content levels. The cage was covered by a lightweight sheet that allowed air circulation but also created a dark, quiet environment; this technique has been shown to be highly effective for transporting small passerines (Bocetti 1994). This transport method was used in the reintroduction of Brown-headed Nuthatches in Florida (Slater 2001) and Western Bluebirds in Washington (Slater and Altman 2011).

After three hours in the holding cage, the approximate time to drive to the proposed reintroduction site (Joint Base Lewis-McChord Military Base), we moved the pair to a small (1.2 m x 1.2 m x 2 m) aviary. The aviary was modeled after those used for Brown-headed Nuthatch translocations in Florida. The aviary was provided with multiple perches and a nestbox for roosting. Food (mealworms, sunflower seeds) and water are provided *ad libitum*. We held birds in the aviary for 3 days.

We monitored bird behavior during the simulation, particularly during the first 24 hours after capture when birds are most susceptible to mortality, to evaluate the condition of the birds. While birds were in the transport cage, we were unable to continuously monitor their condition, but we checked their status after 20, 60, 120, and 180 minutes. At each evaluation we noted whether birds were active and alert (good condition) or appear fluffed, crouched, or lethargic (poor condition). We also evaluated the bird's condition based on the color and texture of feces. White feces with solid matter indicate a bird has taken both food and water; white liquid feces indicate a bird has only taken water; greenish liquid feces indicate a bird has not taken food or water. Individuals with greenish feces were considered to be in poor condition. Individuals in good condition were placed in the small aviary.

Once birds were in the aviary, we monitored their behavior from a blind 35 m away using binoculars. If our presence appeared to impact the birds, we moved farther away. The most significant concerns for individuals placed in the aviary were that they: 1) would not feed, 2) would become stressed from continuously flying inside the aviary, or 3) would injure themselves by hitting the walls of the aviary. We monitored birds until each individual found the food provided and fed. If birds did not

feed within 1 hour inside the aviary, we move food trays or perches in an attempt to better present food. Birds that fed were considered to be in good condition. In addition to determining whether birds feed, we monitored the physical condition of each individual in the aviary. Individuals that appeared active and alert and exhibited common behaviors such as preening and vocalizing were considered in good condition. Individuals that did not feed or preen or that were lethargic and fluffed were considered in poor condition. Once birds fed, they were checked every 1 to 2 hours to verify they remained in good physical condition.

On the second day of captivity, we observed birds at sunrise, midday, and evening to verify individuals were feeding and appeared active and alert. If birds were in good condition at all three observations, thereafter we checked pairs twice a day (morning, evening) for the entire captivity period.

If at any time during the simulation, the survival of an individual was in question, we released that individual back into their territory. Those pairs that readily accepted captivity and were considered to be in a healthy condition following the simulation, were released back into their territory and the simulation was considered a success.

RESULTS

Trial 1

Day one

We captured a territorial pair on the morning of March 4, 2012. The male was captured at 10:00 AM, approximately 15 minutes after erecting the nets. We did not observe the female, and playback vocalizations did not immediately elicit a response. We placed the male in the transport cage and set it next to the net to serve as a lure to attract the female. The female did not appear at the feeder until 11:30, and she flew into the net shortly thereafter. She was placed in the transport cage with the male at 12:00.

During the period when the male was in the transport cage alone, we noticed that it spent much of its time at the top of the cage, often hanging from the top bars. After observing this behavior, we moved the suet blocks on the side of the transport cage to the top. We immediately observed the male feed from the suet in this position. Thereafter, we always placed suet blocks on top of the transport cages.

Subsequent checks of the pair in the transport cage indicated that birds were alert and active over the simulated transport period. On two occasions, both adults were perched together. However, on the two other occasions, we observed the female sitting on the floor of the cage in a crouched position. Although this behavior concerned us, she always appeared alert and in each case she jumped

up to a perch. At no time did she exhibit drooping eyelids or a fluffed appearance, which may have indicated stress. Fecal matter on the bottom of the cage indicated that birds were feeding.

The pair was placed in the aviary at 16:00. Thus, the male was in the transport cage for nearly 6 hours while the female was in the transport cage for 4 hours. Within 10 minutes both the male and the female were observed feeding in the aviary. Shortly thereafter, we observed the male displace the female from the food when she fed and continue aggressive behavior towards her. After being displaced on several occasions, the female moved to the floor of the aviary. We considered removing her from the aviary at this time because of concerns for here health, but as we approached she immediately flew up to a perch. Thereafter, the male and female were observed regularly feeding from the tray at the front of the aviary and branches where mealworms had been placed. We observed no other aggressive interactions that evening.

Day 2

At 06:30 the male was active and flying around. The female exited the nest box at 06:45. We observed both adults feeding. The male was then observed displacing the female, and she returned to nest box. During the day, observations revealed that the female stayed in the box for 10-15 minute periods and then exited the box for 1-5 minutes. The female always defecated when she exited, indicating that she was feeding. When outside the box the female fed or attempted to feed. After a short period the male was usually observed displacing and chasing her, at which time she returned to the nest box. However, while in the nest box, the male regularly brought food to the nest box to feed the female. Overall, both individuals are active and alert throughout the day and were considered in good condition.

Day 3

We observed the same behaviors as on the previous day: the male regularly mate-fed the female in the nest box, the female spent short bouts outside the nest box, but for the most part stayed inside the nest box. This behavior was very consistent with breeding behavior. Because the birds were exhibiting such strong breeding behavior, we decided to release the pair early in the afternoon. The pair had passed all of our criteria for accepting and handling captivity, indeed the fact that they were exhibiting breeding behavior strengthens this view. At 12:30 the pair was released and they immediately fly to nearby oaks, calling regularly. They were observed in the capture area on subsequent days. They were also observed on their territory during the 2012 breeding season.

Trial 2

Day one

At the second site, we placed nets at feeders at 08:00 on March 5th, 2012. Birds responded to playbacks by calling, but did not approach the trapping site. The pair then disappeared and we spent the morning looking for them in the area, regularly checking the net site. At 11:00, we found the female captured in the net and the male nearby. After removing the female, we used her as a lure and captured the male.

For this transport simulation, we placed each individual in separate cages after observing the male dominant behavior in the aviary during Trial 1. Checks at 20, 60, 120, and 180 minutes found both individuals always on the perches. We observed suet on the male's bill indicating he was feeding. Fecal matter on the bottom of the cage also indicated that birds were feeding and in good condition.

At 15:15, four hours after being in the transport cage, we placed the pair in the aviary. In this aviary we added a second feeding tray and we put sunflower seeds on top of the nest box to provide more opportunities for each individual to access food in case any sex-dominant behavior occurred. Both individuals appeared calm in the aviary and vocalized regularly. The male was observed feeding on sunflower seed on top of the nestbox within 10 minutes of release into the aviary; the male also fed on the mealworms. At 15:45 the female was observed feeding. Both birds continue to feed and vocalize regularly through the afternoon. We observed one instance where the male displaced the female, but otherwise there were no interactions. In fact on several occasions the pair fed at the same time on the same branch.

Day 2

During an hour-long observation beginning at sunrise, birds were active and feeding on both sunflower seeds and mealworms. We observed no aggressive interactions, such as those seen in Trial 1. Observations at midday and in the evening observed similar behavior.

Day 3

Birds were observed in the morning feeding and in good condition. The pair was released at 10:00. The pair was subsequently observed on multiple occasions over the next couple of days.

DISCUSSION

Both translocation simulations were considered a success during each stage of the translocation process: capture, 4-hour transport in a small cage, and several days in an aviary. During all observations, translocated individuals were considered in good condition; they appeared active and alert and

exhibited common behaviors such as preening and vocalizing. Individuals quickly found food provided for them and were observed feeding from all 3 sources of food, suet block, sunflower seeds, and mealworms. At no point did any of the four individuals appear in poor condition, defined as not feeding or preening or by appearing lethargic and fluffed.

We classified both translocation simulations a success, but we did observe substantially different behavior between the two pairs. While one pair showed no unusual activity, the other pair exhibited strong breeding behaviors, such as aggressive interactions between the male and female, the female spending substantial amount of time in the nest box, and the male mate-feeding the female. The simulations were conducted in early March, which is at the beginning edge of the breeding season for this species. The pair that exhibited breeding behavior was captured in a residential area. Pairs at residential areas may be farther along in the breeding phenology because they have been provided supplemental food during the winter. This predictable food source likely allows the pair to consider breeding.

We learned several key pieces of information about protocols for nuthatch translocations. First, pairs should be placed in different cages during the transport period. This prohibits any sex-dominant behavior that could exclude one sex, likely the female, from accessing food. Second, suet blocks should be placed on top of the transport cage, rather than the side or bottom. In the transport cage, nuthatches tend to move to the top of the cage and hang upside down, often pecking at the cage. Placing suet above them appears to increases the likelihood that they will find the food quickly. Third, in the aviary, multiple feeding platforms with mealworms and sunflower seeds should be provided. Again, this provides individuals with several options for food and decreases the likelihood that one individual could exclude its mate access to the food tray.

Overall, this study showed that the Slender-billed White-breasted Nuthatch appears to handle capture and captivity well, an important property for being a candidate for translocation.

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