

THE SONGBIRD

THE BIENNIAL NEWSLETTER OF THE NORTH AMERICAN SONGBIRD WORKING GROUP, AN INITIATIVE OF THE AZA PACCT TAG

SPRING 2022



Black-throated Gray Warbler (Setophaga nigrescens)
by Eric Peterson

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Message from Stacy Hill and Lori Smith

Smithsonian's National Zoo & Conservation Biology Institute

North American Songbird Working Group Co-Chairs

For regular readers, you may notice there has been a change in leadership recently. Lori Smith and I will be taking up the mantle of co-chairs for the North American Songbird Working Group, an initiative of the AZA PACCT TAG, from Nikki Smith (Columbus Zoo) who has served in a leadership position since its creation in 2017. She began as a co-chair with Sara Hallager (Smithsonian's National Zoo & Conservation Biology Institute) from 2017-2019 before she took over as chair when Sara moved to co-chair the SAFE North American Songbird program with Dr. Mike Kreger (Columbus Zoo). We are honored to be the next stewards and advocates for husbandry of North American songbirds in human care. As we settle into our new roles, we plan to meet with the steering committee and discuss how we can further support keepers, institutions, and the birds in their care. In the meantime, we will continue with our biannual newsletters, highlighting the amazing work done by all the current holding institutions. We have a wonderful and varied set of articles in this edition covering UV lights, ambassador animal training, geriatric songbird care, the complexities of managing mixed-species aviaries, and species highlights for the loggerhead shrike, black-and-white warbler, and common yellowthroat. We hope you enjoy, and get ideas for your own stories to share in the next edition.

Cache it in for Blue Jays

By Stacy Johnson, Curator- Live Animal Care Center & Pam Scherl, Vertebrate Keeper
Museum of Science, Boston

The Museum of Science, Boston cares for over two hundred animals within its collection. Some animals have permanent or temporary exhibit spaces while the remainder support our ambassador program behind the scenes at the Live Animal Care Center. We also have several rotational exhibit spaces. For example, we have five box turtles that we rotate between three different enclosures providing dynamic experiences for the animals. When collection planning, it is important that we choose animals that will do well in exhibit spaces as well as be ambassadors for our education programs. Our education staff work with animal keepers to properly train on the animals for handling and operant conditioning programs.



Virtual programming with educator Marcus Caceres .

During our last collection planning meeting, it was clear that we wanted to increase the number of native animals within our collection. Shortly after, we saw that a blue jay had become available. That's where "Cobalt" enters into our story. He was rescued as a fledgling by a good samaritan in Florida and raised in their house. When they tried to release him, he would not leave so they brought him to a wildlife rehabilitator who attempted rewilding. But it was clear that he was way too friendly, choosing to sit on people's heads and shoulders so he was finally deemed non-releasable. He was then transported to Boston, where we were hopeful we would be able to work with him for free flight programming.

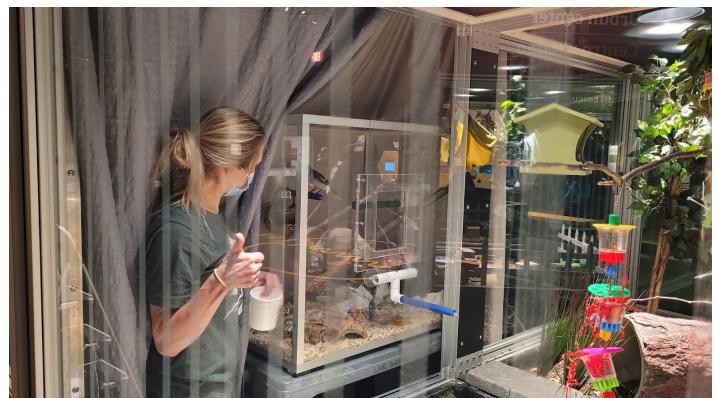
Our hopes and dreams of free flying "Cobalt" were quickly smashed. We tried for several months but "Cobalt" just couldn't resist constantly flying off to something shiny and



"Cobalt" the blue jay visiting exhibits in the museum.

new, and sometimes that was to people he had never seen before. Blue Jays love to cache, or hide, food or other interesting objects, and overcoming this tendency was a huge challenge. Due to restricted space available in the Live Animal Care Center and Museum, we weren't able to create a flight space for him on-grounds for more intensive flight training. We needed to come up with a plan B...and quick!

We had a large plexi box that had previously been used by a gray squirrel for programming. Revamping the inside with various perching, we began training "Cobalt" to transfer into the plexi. From the plexi, we can safely transport him to the stage, studio or exhibit space. He is very visible for guests, and also allows the visitors to get closer to him than they normally would be able to.



Shifting into the plexi for Asst. Curator, Liz Logan.

Cache it in for Blue Jays (continued)

He has special caches within his plexi and is always eager to return to search for his treasures, or to stash new ones. He will also forage for bugs in the plexi, displaying great natural behaviors we would not have been able to show with free flight programming.

Training with “Cobalt” has not come without its challenges. We have had to adjust training plans and come up with alternative solutions. One example of this is crate training. We started crate training “Cobalt” with the thought of transferring him between his new rotational exhibit space and his behind the scenes enclosure. We found that while “Cobalt” enters the crate quickly when he is behind the scenes, he does not want to enter the crate when out on exhibit. We had to once again come up with an alternative plan which was the program plexi. With some problem solving for containment issues at the enclosure space, we were able to easily switch to using the plexi for transfers while we continue to work on crate training.

He is also a lot of fun to enrich. He gets really loud and excited when he hears the music of the band Queen or recordings of songbirds, loves to destroy wooden pieces and eagerly tries to steal our pens to be able to cache away from us as quickly as possible! The staff are always finding new and innovative ways to provide enrichment. The plexi is not just a source of containment, but has evolved into enrichment as well! “Cobalt” is able to make rounds around



“Cobalt” the blue jay checking out the shells exhibit.

the museum floor too. By transferring into the plexi, he is able to go on walks to different exhibit halls. He becomes very excitable with the dinosaurs and is very interested in the shiny shells on display. This also allows him to informally meet his adoring fans who wander the halls. Even people who have claimed they don’t like birds can’t claim that statement after meeting “Cobalt”.

“Cobalt” is a star, both in the hearts of our staff and our guests. He is always busy doing something, eager to show off during tours and loves to mimic the sounds of the barn owl, screech owl and kestrel who live nearby. He will even mimic a few human whistles and the microwave too.

“Cobalt” has been a welcome challenge in meeting his complex needs and it is absolutely impossible to imagine our collection without our blue jay friend. He brings happiness and boundless energy to the Live Animal Care Center. He has taught so many people about the joys birds bring and why they are so important to our world.

Photo credit:

Marcus Caceres: virtual programming still shot from MOS@School live programming

Stacy Johnson: all others



“Cobalt” going outside in the program plexi.

Managing a North American Songbird Aviary at the Akron Zoo

By Mallory Balmert, Wild Animal Keeper II

Akron Zoo

The Akron Zoo's Grizzly Ridge Aviary is home to 27 species of North American songbirds native to Ohio, including passerines, waterfowl and gamebirds. The Mike and Mary Stark Grizzly Ridge area of the zoo highlights North America's native species including grizzly bears, North American river otters, red wolves, coyotes, and one of AZA's largest North American songbird aviaries, which was established in 2013.

Most of the aviary birds are wild-hatched birds that are rehabilitated after injury in the wild, and some are captive-hatched from other zoological facilities. Due to Akron Zoo's partnerships with Ohio Lights Out (Lights Out Cleveland and Lights Out Akron-Canton) and licensed-wildlife rehabilitators, the Akron Zoo can provide homes for many injured and rehabilitated non-releasable birds that are found in Northeast Ohio and the surrounding region. Ohio Lights Out is a program run by the Ohio Bird Conservation Initiative (OBCI) that "is working to prevent bird collisions [with buildings]." A study (Loss, Will, Loss, & Marra, 2014) estimates that over one billion birds die from building collisions in the United States annually, and this is most common during spring and fall migration. Most of these birds come to the Akron Zoo with wing injuries or other types of physical traumas suffered from a window collision. After their quarantine period, they are flight-tested to ensure they can navigate the terrain of the aviary and perch and fly appropriately. By allowing these birds to have a second chance in the aviary, guests can gain an appreciation for native birds and learn about conservation actions they can take to help local wildlife. The Akron Zoo is a partner of OBCI and financially supports OBCI's Lights Out programs through the Akron Zoo Conservation Fund.

The Aviary is a close representation of the birds' natural environment built into a hillside of the zoo. The terrain includes grass, dirt, rocks and a pool of varying depth and water flow. There are two indoor holding areas with shift doors directly to the habitat for birds to access shelter. These holdings can be split into two or connected into one large holding by a shift door. This is helpful for separating some birds for medical treatment, but still allowing them visual access to other birds, which fly in and out from the aviary. This is an immersive habitat, with guests able to walk on a wooden deck and view birds in trees at eye-level or look down into the habitat at the ground birds below. Staff attendants are not necessary to allow guest access



The author in the North American Songbird Aviary at Akron Zoo

into the aviary, due to a double set of magnetic doors that only allow one set to be open at once.

Seasonal changes greatly affect the management of the habitat. Winterization measures include the installation of multiple radiant heaters, bedding areas with straw, installation of pool heaters and a heated birdbath.

Upwards of 40 cut pine trees, donated by a local tree farm, are also added to the habitat to provide natural shelter for the birds. Small migratory species, such as warblers, are housed indoors during the coldest months to protect them from the elements. The winterization tools are removed in spring and nesting material is added in preparation of breeding season. During summer, the indoor holding temperatures are brought down by fans, the pool is cleaned weekly to prevent algae growth, and birds are misted intermittently throughout the day with a hose from the keeper area.

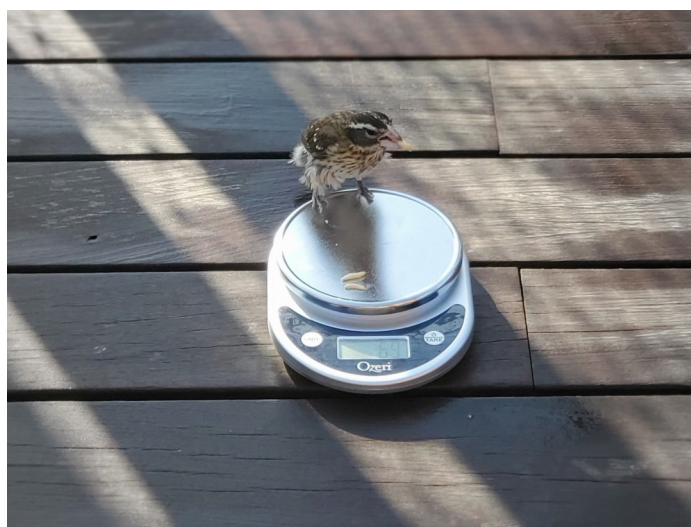


Songbirds such as this female Baltimore oriole are trained to come to a keeper's hand to assist with visual observations of the birds.

Managing a North American Songbird Aviary (Continued)

The Aviary promotes local conservation ideas that zoo guests can implement at home, such as feeding birds and planting bird-friendly trees and shrubs in their own backyards. The birds are fed on multiple hanging feeders placed throughout the habitat, with considerations being made to place them under shelter during inclement weather. There are also multiple seed feeders with seed mix that are continually restocked so the birds always have access to this mix. During winter, chopped nuts are added to the diet to help birds maintain appropriate weight. In the summer, nectar feeders are placed throughout the habitat. The birds are also fed wax worms daily throughout the year, which is a high-value food item, typically on the deck in the morning as a part of a training program. Trained behaviors include voluntary scale training, deck feeds and having birds eat from keepers' hands. Having birds come to the deck to feed or to keepers' hands allows for keepers to get a better visual on the birds and assess their physical well-being. Scale training allows keepers to better monitor the health of the birds and catch any medical issues early. Goals for future training include a recall into the holding area, station training to separate each species, crate training and a voluntary footbath behavior for preventative treatment of foot mites.

Challenges to managing a large multi-species aviary include getting visuals on birds on a regular basis, capturing birds



Songbirds such as this female rose-breasted grosbeak participate in voluntary scale sessions.

from the habitat, tracking nests and nesting pairs and accessing the habitat when repairs need to be made due to size of keeper doors, terrain and keeping birds from interacting with construction equipment. Training deck feed and hand feed behaviors help with getting visuals on birds and maintaining an accurate census of the birds.

Future training of crate and recall behaviors could help with capturing birds from the habitat. Tracking nests has been made easier by using plastic numbered tags to mark individual nests and an online chart that has the ID tag, species nesting, possible parent ID accession numbers and comments to update during the nesting process (number of eggs, hatchlings, fledglings, etc.).

A dynamic, multi-species North American aviary can have many challenges regarding avian management. These challenges provide opportunities for innovation, collaboration and professional growth of the keepers who take care of it. The Aviary also provides many benefits to the zoo and community as it allows for educational opportunities for our local community. Recently, Akron Zoo has received a RemotEDx Grant that is a state-level initiative. The initiative brings together a unique mix of remote, hybrid and blended learning partners from across the state. It helps schools and districts enhance, expand and more effectively scale high-quality remote, hybrid and blended education delivery models. The focus at Akron Zoo is on problem-based learning and local species conservation, with North American songbirds as a primary focus.

Akron Zoo is accredited by the Association of Zoos and Aquariums (AZA) and is a founding partner of the AZA's SAFE-North American Songbird Program. SAFE (Saving Animals from Extinction) is a program that leverages the conservation efforts of the AZA's entire membership, which includes 238 accredited zoos and aquariums. Primary goals of the SAFE-North American Songbird Program include:

- Addressing the effects of free-roaming domestic cats on songbird populations
- Preventing bird window collisions
- Addressing the impacts of the illegal wildlife trade on North American songbirds
- Prevention of habitat loss and the effects of non-native species on North American songbirds
- Increasing the awareness of the effects of environmental contaminants on North American songbird populations.

Many zoo visitors are surprised to see a North American songbird aviary in a zoo. They come expecting the traditional combination of "lions, tigers and bears..." which are also a focus of the Akron Zoo. However, North American songbirds have their own conservation message to share.

Managing a North American Songbird Aviary (Continued)

While most people think of our North American songbirds as common, the truth is that these populations have declined at an alarming rate. The biodiversity crisis has come to our own backyards. According to the American Bird Conservancy, “In less than a single human lifetime, 2.9 billion breeding adult birds have been lost from the United States and Canada, across every ecosystem and including some familiar bird species.” To put it another way, 25% of our North American songbirds have vanished from our landscape since the 1970s. Our hope is that the Akron Zoo’s North American Songbird Aviary will inspire conservation actions that prevent these beautiful species from permanently disappearing from our own backyards.

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Baltimore oriole in the Akron Zoo’s North American Songbird Aviary.

Shining Light on the UV Lighting Needs of Songbirds

By Jennifer Ferraro, Animal Keeper

Smithsonian's National Zoo and Conservation Biology Institute

Meeting the housing, welfare and nutritional needs of captive songbirds is critical especially when working with species that have never been kept in human care before. The Smithsonian's National Zoo and Conservation Biology Institute (NZCBI) began exploring the importance of artificial lighting to native songbirds kept in human care. Over the past year, we have started monitoring and researching the UVB and UVA requirements for the native songbirds in our care.

Unlike humans, songbirds can see into the ultraviolet range between wavelengths of 280-400 nanometer (nm) (1). The ultraviolet range can be divided into the UVA range (between 320-400 nm) and UVB range (280-315 nm). Both play an equally important role in the welfare and management of songbirds in human care. Birds utilize the UVA spectrum range to identify suitable breeding partners, forage for food and nesting material, and egg identification (2). UVA light also contributes to creating shadows in large exhibit spaces which provides visual preferences to meet the needs of traditional canopy dwellers, middle forest dwellers, and ground dwelling species (2). Each of these elements play a pivotal role in the welfare and breeding success of songbirds managed under human care.

While UVA lighting improves the environmental management of songbirds, UVB is equally important in managing the health of the songbirds. UVB is critical in managing the calcium levels of songbirds by activating Vitamin D₃. Vitamin D₃ is ingested by songbirds one of two ways. First through production of Provitamin D in the liver which is then secreted on the skin and/or the uropygial gland and ingested while preening (3). The second method is by ingesting Vitamin D₃ in their diet. In either form, Vitamin D₃ must be converted to cholecalciferol when exposed to UVB before it can be used to transport calcium throughout the body (4). It is well documented that deficiencies in Vitamin D₃ can lead to egg binding, rickets, and joint/leg deformities in chicks (5).

In outdoor spaces, songbirds require 11-30 minutes of direct sunlight to activate Vitamin D₃ (5). However, many songbirds are housed in indoor spaces, which leads animal caretakers to question how much artificial UVB light is needed for optimal management. While there is little

research to determine the amount of UVB light exposure that is required in indoor settings for passerines, studies on poultry and psittacines have shown that 2-4 hours of UVB light a day can increase levels of cholecalciferol in the blood (1), (6). Additional studies have also shown a decrease in rickets and bone abnormalities with 2-4 hours of UVB exposure (5).

What does this information mean for zoos and aquariums managing passerine species in indoor settings?

Full spectrum lighting should be added to all songbirds housed indoors without access to natural sunlight. UVB lighting should be offered for a minimum of 2 hours, but preferably 4 hours, per day. At NZCBI, we have added 120V (160 Watts) mercury vapor bulbs over our songbird off exhibit enclosures. These bulbs produce UVB at 280-320 nm within 30 cm of the bulb. Perching was placed near the bulbs to maximize the amount of UVB exposure a songbird would receive while basking under the bulb. The amount of UVB generated by the bulbs is monitored using a UVB meter. Usable Vitamin D₃ generated by the bulb is also monitored using a Reptile UV Index Meter.



UV bulb testing stand built to hold bulbs at 30cm above the meter to standardize measurements.

Shining Light on the UV Lighting Needs of Songbirds (continued)

By Jennifer Ferraro, Animal Keeper

Smithsonian National Zoo and Conservation Biology Institute

Bulb efficiency is measured three ways. First, bulb efficiency is measured using a stand that holds the bulb exactly 30 cm from the top of the meter. This standardizes trends and accurately measures the efficiency of the bulb over time. Second, UVB light is measured 30 cm from the bulb within each enclosure. We compared these values to determine if the overhead mesh decreases the efficiency of each bulb. Lastly, we measured UVB at the nearest perch so adjustments can be made to maximize exposure. Our data showed that the mesh decreases the amount of UVB generated by 10-15 nm. This was overcome by adjusting the distance of perching to the bulb to ensure that the perching nearest the provided adequate UVB exposure. Spot checks of the bulbs are completed monthly to ensure proper function. Over the past year, our data shows UVB bulbs lasted approximately 3 months (with 6-8 hours of use per day) before they no longer generate UVB light within the spectrum to activate Vitamin D₃. Using the research previously mentioned, we began decreasing the hours the bulbs are on to 4 hours per day to increase the longevity of each bulb. Additionally, we are targeting changing each bulb to maximize UVB exposure so that it correlates with the start of breeding through chick rearing. This allows us to minimize disruptions to breeding pairs and maximize UVB absorption when songbirds metabolically require high levels of calcium for egg laying and chick growth.

Since installing the bulbs a little over two years ago we have seen some positive behavioral changes in the 95 North American songbirds housed at NZCBI. For example, it's not uncommon to find one of our female grey catbirds (*Dumetella carolinensis*) with her wings splayed out and tail up absorbing as much light as possible. Our fifteen-year-old swamp sparrow (*Melospiza georgiana*) is often found sitting on leaves directly under its UVB bulb; choosing to spend most of the day basking under the light and the heat generated by the bulb. We have also seen an increase in the time spent under the bulbs during periods of heavy molting activity. Some of our songbirds, like the Baltimore orioles (*Icterus galbula*) and rose-breasted grosbeaks (*Pheucticus ludovicianus*) have built nests near or under the light source as well. It is our hope that as we continue to research UV lighting for each type of enclosure that we will see even more benefits in our collection in the future.

There is still much to learn about lighting and its impact on

passerine species. Much of the research involving benefits of UV lighting were split between recommending fluorescent bulbs or mercury vapor bulbs. Additionally, many zoos and aquariums are turning to LEP (light emitting plasma) lights that emit across the UVA and upper level of the UVB spectra. Additionally, there is little to no research comparing the benefits of each type of bulb and what attracts songbirds to bask under the bulb -- heat or the UVA/UVB light itself.

Providing adequate lighting for songbirds kept in human care is a necessary component of animal care. Our goal is to build a foundation for creating enriching environments that also meet the metabolic needs of our songbirds. While there are gaps in our current knowledge, we are learning more each year. The knowledge gained through ongoing research will lead to a brighter future for songbird species in our care.

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How Do You Raise a Loggerhead Shrike?

By Leighann Cline, Bird Keeper

Smithsonian's National Zoo & Conservation Biology Institute

Mmeet the loggerhead shrike—a beautiful songbird with a gruesome reputation for impaling its prey on thorns and barbs. More frightening than the “butcher bird’s” hunting habit is the reality that their populations are in steep decline. Since 2005, the Smithsonian Conservation Biology Institute (SCBI) has worked to breed and reintroduce this bird back into the wild.



Pair Introduction

Before the breeding season, every loggerhead shrike starts out single. That’s because these birds are solitary for most of the year, and we imitate this natural behavior by keeping them in individual enclosures throughout fall and winter. Once we receive breeding recommendations from our partners at Wildlife Preservation Canada, we place those birds in adjacent enclosures with a “howdy” screen in between. In this setting, they can see, hear and interact with one another, but still have their own separate spaces. This gives us a safe and controlled setting to determine if the male and female are interested in each other.

Breeding

Breeding season begins in late February, and to help “set the mood” I remove the screen that separates our potential pair and provide them with plenty of live crickets. Since birds are not always compatible, I observe the shrikes from a blind a short distance away on the hillside. If all goes well, the male will bring a cricket to the female, and she will accept his offering. This gesture is followed by singing and courtship displays. If a female is really smitten, she may start nest building immediately!

Nest Building

Shortly after the pair meets, nest building begins. I provide them with many materials to choose from, including sticks, branches, grasses, coconut husk and Spanish moss. Shrikes like to line the inside cup of their nest with fur, so I often ask my fellow SCBI keepers to contribute. Our birds have lined their nests with fur and hair from cheetahs, Przewalski’s horses and bison!

The parents-to-be spend one to two weeks perfecting their nest. The female does most of the work, but the male likes to show the female he is making an effort by bringing the occasional twig or tuft of fur over to her. Most of the time, the female will immediately remove his efforts and continue to make the nest to her liking! She does, however, accept gifts of food from him throughout the process.

Egg Laying and Incubation

Once the nest is “perfect,” the female lays her clutch of eggs—one per day—over five or six days. When I deliver the parents’ diets in the morning and afternoon, I check to see if both birds are healthy and getting along. A sure sign that the female has started laying eggs is when she sits on her nest in the morning, but not in the afternoon. Only the female incubates the eggs; she leaves only for a few brief moments.



When the female has been sitting for a few days, I enter the enclosure to check the nest. I count all the eggs, then candle (shine a light into) one or two to check for fertility and development. The whole process only takes about 2 minutes. Later, I observe the pair from a distance to ensure the female returned to her nest. If all goes well, the chicks hatch in just 16 to 18 days!

How Do You Raise a Loggerhead Shrike? (continued)



Nestlings

To determine when hatching has occurred, I look for three behaviors: the birds appear to consume more of their diet; the male more frequently brings food to the female; and the female stands up and reaches underneath her after the food has arrived.

The nesting period is a sensitive time, so I try not to disturb the family for several days. Once I think the chicks are five to seven days old, I will enter the enclosure for a quick nest check. Hopefully, I find chicks! When I do, I count them and take note of their size and developmental milestones to confirm the hatching date more accurately. This nest check is usually a bit tricky, as some of our males will fiercely defend the nest!



Fledging

Loggerhead shrike chicks go from hatching to fledging in just over two weeks. Usually, I will see them standing on the edge of the nest for a day or two before they finally take the leap. The first few days after they fledge, the chicks will hide themselves in the leaves and stand very still when I approach. It is often challenging to account for all

our chicks during this time, so I may watch from a blind and observe where the parents are bringing food.

As they grow, the fledglings become more mobile and very demanding. The parents have their work cut out for them—they bring food constantly to all of their chicks. Live crickets and mice help the chicks learn to start feeding themselves. Since these chicks will be released into the wild, it is crucial that they learn how to hunt for themselves.

Chicks stay with their parents for at least 3 weeks after they fledge. After that, mom and dad's job is done, and we move the juvenile birds to a new enclosure, which they share with their siblings. To prepare them for release, we tag each individual with a unique, colorful band, deworm them and administer a series of vaccinations to protect them against West Nile virus. After our young shrikes leave, mom and dad return to their respective enclosures for the fall and winter while we await next season's breeding recommendations.



SCBI bird staff place identification bands on juvenile loggerhead shrikes that are destined for release into the wild.

Release

Every year, the loggerhead shrikes we hatch are released in Ontario, where the species is critically endangered. One night in early August, we round up all of our juveniles, place them in crates and drive them overnight to the United States-Canada border. Once we clear inspections on both sides, we take the birds directly to our Wildlife Preservation Canada partner's release site in Carden, Ontario.

How Do You Raise a Loggerhead Shrike? (continued)

At the site, the shrikes are released into field pens. They spend about two weeks acclimating to their environment. At the end of that period, our partners examine each bird and band them with a unique numerical band and multiple color bands, which make it easy for the field team or the general public to identify an individual bird and report them back to us.



SCBI's juvenile loggerhead shrikes are ready for transport

Some of them also receive radio telemetry tags to help track their post-release movements using the MOTUS system—a network of radio towers that pick up a bird's unique tag number when the animal flies near it.

Once the birds receive their tags, they are “soft-released;” that is, the doors to the field pens are opened, but the field team continues to provide food and water for the birds. Birds can come and go from the pens as they please until they choose to start their migration.

What's Next?

The Loggerhead Shrike Reintroduction Program has been very successful. Since 2000, more than 1,300 shrikes have been released into the wild. Without this program, many of the most vulnerable shrike populations—like those found in Ontario—would have been wiped out. This year, about one-third of the birds spotted in Ontario came from breeding facilities like ours at SCBI!

In addition to the MOTUS system, the Loggerhead Shrike Reintroduction Program relies on citizen scientists in the U.S. and Canada to get into birding and go looking for shrikes. If you are lucky enough to find one with bands on its legs, you can report it on eBird or to your local wildlife department.

In September 2021, a birder near the U.S.-Canada border

spotted a shrike with a MOTUS transmitter attached and took some fantastic pictures of it. Those photos made it to our partners, who looked up the band numbers and found that it was one of the chicks that was raised at SCBI this past summer! The bird was observed actively hunting and capturing prey and appeared to be in great condition. It is always wonderful to know that our hard efforts are rewarded with an animal thriving in the wild.

This article appears in the November 2021 issue of National Zoo News.



Birder Dan Pay photographed this loggerhead shrike Sept. 3, 2021, at Port Weller East Pier in Ontario, Canada. The bands tell scientists that this bird hatched at SCBI in summer 2021!

How Do You Care For Elderly Swamp Sparrows?

By Sara Hallager, Curator of Birds and Stacy Hill, Animal Keeper

Smithsonian's National Zoo & Conservation Biology Institute

It all started with swamp sparrows.

The year was 2007, and our colleagues at the Smithsonian Migratory Bird Center had just concluded a study that involved 35 swamp sparrow chicks. Since they could not be released to the wild, the Bird House team took the young birds under our wing.

In doing so, the Smithsonian's National Zoo became the first institution to keep swamp sparrows in human care and manage them as a collection. This flock was among the first native songbirds that we worked with, and early lessons learned helped inform our current best practices for acclimating songbirds into human care.



Typically, swamp sparrows only live five to seven years in the wild. Over the years, our flock of 35 swamp sparrows shrank through natural attrition. The numbers declined until we had just two left—a male and female—who, at nearly 16 years old, are still in our care today. The fact that they continue to thrive is a testament to the dedication of our team, and what these birds have taught us about animal husbandry.

Our male and female swamp sparrows have distinct personalities, and the keepers who work closely with this pair liken them to an old married couple. They squabble and jockey for food. They take frequent naps. And, as with people, they have started to “gray” in their older years. Our elderly swamp sparrows have earned the right to be a bit curmudgeonly, but that’s only one aspect of their personality. They are also inquisitive, athletic and incredibly charming.

At this stage in their lives, our swamp sparrow pair are well past their reproductive years. It is just as well since they

belong to different subspecies and would not be candidates for breeding anyway. That said, they are wonderful companions for each other, and their bold and charismatic natures make them excellent ambassadors for their species. Having them as a part of the Bird House collection provides our team an opportunity to champion their unique charms.

Our swamp sparrows also offer a great model for how to care for aging songbirds down the road. Due to our male swamp sparrow’s advanced age, he was experiencing joint stiffness and soreness. Luckily, he showed an interest in interacting with his keepers.

As part of our positive reinforcement training program, we taught him to “station”—come to a designated spot—so we can feed him tasty waxworms with his arthritis medication. It only took two days for him to learn the routine. He eagerly participates in this interaction and often waits for his keepers to receive his “treat” (and medicine) twice a day.

To keep our swamp sparrows active, keepers often scatter-feed them crickets, which encourages the birds’ natural hunting and foraging behaviors. For an added challenge, keepers hide insects among a pile of leaves, and the swamp sparrows have to dig through them to find their meal. Unlike other sparrow species that hop along the ground, swamp sparrows have a tendency to scurry as they forage. It is an endearing and somewhat unexpected sight to behold!



How Do You Care For Elderly Swamp Sparrows? (continued)

True to their name, swamp sparrows enjoy being in and around water. We offer all of our songbirds regular mist-baths, but our swamp sparrows enjoy dousing themselves in their water bowls. To simulate the water along a marshy bank, we also provide shallow trays of water for them to wade through.

Swamp sparrows are very vocal. Males sing to defend their territories against would-be rivals and to woo potential female mates. Females select which male they want to breed with, and research suggests that females prefer faster songs with a simple trill. Looks are very important as well; females tend to go for males with distinct head features, such as rust-colored crown feathers, black forehead patches and larger bills.



In the wild, nests are comprised of a rough exterior made of dried grasses, plant stalks, twigs, leaves or rootlets, with a softer interior made of finer grasses, hair, plant fibers or down. To mimic these materials at the Zoo, we provide our sparrows with pine needles, paper strips, twigs, coconut fiber, cotton, alpaca hair, dried grasses and leaves. Females select the nest site; usually, they are located just above ground or water in dense grasses, cattails or shrubs, and are packed into the selected vegetation for support. Males might bring materials to the build site, but only females are responsible for the construction.

Once the female lays eggs, she incubates them for up to 14 days. After the chicks have hatched, both parents make frequent feeding trips. Only females brood the nestlings, who fledge (leave the nest) after about 10 days. Often, mothers will continue to care for chicks up to 15 days after they fledge—even if she is building a nest for a second brood! Around one month old, the chicks are self-sufficient and go off on their own.

Our team has learned a great deal in taking care of swamp sparrows for nearly 16 years. The legacy of our male and female swamp sparrow—and the 33 others who came into our care—has helped our team **write the book** on the husbandry, **diets**, environmental **enrichment** and other factors that migratory songbirds need in order to survive, thrive and reproduce.

Swamp sparrows are a species of least concern, according to the International Union for Conservation of Nature, but wild populations still face threats, such as the draining of wetlands and rising sea levels. The long-term prospects of this sparrow will largely depend on wetland conservation. We are studying these common birds while they are still common—before it is too late to save them from extinction.

Although our swamp sparrows will not be on exhibit when the Bird House reopens in late summer 2022, we look forward to introducing our visitors to other charismatic sparrow species, including grasshopper sparrows, white-throated sparrows and song sparrows. We hope that by meeting a few of the 132 species of New World sparrows, our visitors will come to appreciate how truly special and remarkable these little migratory songbirds are.



"The back of a swamp sparrow is like a tiny quilt of rusts, browns, and buffs with pale, creamy-white highlights. A close-up view is a sight worth beholding."

*Dr. Russell Greenberg
Head, Smithsonian Migratory Bird Center
(1991-2013)*

This story appears in the December 2021 issue of National Zoo News.

Species Fact Sheets

Order: Passeriformes
Scientific Name: *Mniotilta varia*

Family: Parulidae
Common Name: Black and white warbler

AZA Management: Green Yellow Red None



NATURAL HISTORY:

Geographic Range: Europe Asia North America Neotropical
 Africa Australia Other

Habitat: Forest Desert Grassland Coastal
 Riverine Montane Other [Click here to enter text.](#)

Circadian Cycle: Diurnal Crepuscular Nocturnal Other [Click here to enter text.](#)

Cold Tolerance: To 70° F To 60° F To 50° F To 40° F
 To 30° F To 20° F Other [Click here to enter text.](#)

Heat Tolerance: To 30° F To 50° F To 70° F To 90° F
 To 110° F Other

Diet: Frugivore Carnivore Piscivore Insectivore
 Nectivore Omnivore Folivore Other (Add Below)

Captive Dietary Needs:

Has been successfully kept on a diet of passerine base mix, egg mix, and insects. The passerine base mix includes Mazuri softbill diet, Mazuri insectivore diet, and chopped banana, apples, zucchini, papaya, blueberries, and melons. The egg mix includes chopped hard-boiled egg in the shell and Marion Zoological All-preem parakeet pellets. Insects offered daily include gut-loaded mealworms, waxworms, and gut-loaded crickets. All insects are dusted with a calcium carbonate powder in the winter and calcium + D3 powder in the summer. The diet is changed between the breeding and non-breeding seasons. During the non-breeding season, the birds get 40% of their kilocalories from base mix, 15% from egg mix, and 45% from insects. During the breeding season, the proportion from insects is increased to 60%, the egg mix is increased to 25%, and the base mix is reduced to 15%.

Species Fact Sheets

Life Expectancy in the Wild:

Oldest recorded 11 years 3 months

Males: Undetermined

Females: Undetermined

Life Expectancy in Captivity:

Males: Undetermined

Females: Undetermined

BREEDING INFORMATION:**Age at Sexual Maturity:**

Males: 1 year

Females: 1 year

Courtship Displays:

Males will pursue females and will perch near them with fluttering wings.

Nest Site Description:

Nests typically on or near the ground, preferentially against a log, stump, or shrub, but may nest higher up in a cavity on top of a stump. Nests are cup shaped, typically made of dry leaves, coarse grass, strips of inner bark, pine needles and rootlets. The small cup is lined with finer materials like horsehair, moss, or thin grasses. Nest size varies, but the outside diameter ranges from 7.5 – 13.0 cm. The inside diameter is between 4.4 and 7.8 cm with a depth of 2.5 – 6 cm.

Clutch Size, Egg Description:

4 to 6 eggs, usually 5, single brood with uncommon double broods. Eggs are white, or cream-white, with fine brown speckling on the larger end of the egg. Sometimes eggs may be pale blue or green with lavender or pale lilac speckling.

Incubation Period: About 10-12 days

Fledgling Period: About 8–12 days

Parental Care: Only the females brood, but both parents feed young and defend the nest.

Chick Development: Altricial

CAPTIVE HABITAT INFORMATION:**Social Structure in the Wild:**

Generally, a solitary species except when paired during breeding season. Individuals will loosely follow mixed-species flocks of small insectivorous songbirds on winter grounds, but will also fiercely defend their winter territory against other birds.

Social Structure in Captivity:

Both males and females seem to tolerate mixed-species flocks when out of breeding season. During breeding season males may become aggressive, defending their established territory.

Minimum Group Size: 1

Maximum Group Size: Undetermined

Compatible in

Mixed Species Exhibits:

Yes

Comments:

Has been successfully kept in mixed species groups with other small songbirds. They typically have very few issues with aggression in the non-breeding season but may need to be monitored more closely during breeding season.

Species Fact Sheets

Optimal Habitat Size: Undetermined, but they have been housed in off-exhibit holding averaging 4' x 9' x 7' or 8' x 9' x 7'

Management Challenges: Captive breeding has proven possible, although difficult to foster. The first successful nesting attempt at Smithsonian National Zoo and Conservation Biology Institute was cut short when the female fell ill due to hypocalcemia. The diet must increase calcium for breeding season as egg laying is exceedingly taxing. A female may lay close to her weight in eggs in a single clutch. For comparison, this would be similar to the increase in percent calcium provided to high egg production poultry. Currently, birds receive about 4.0-4.6% calcium in winter and 5.3-7.2% calcium during the breeding season. These values assume the birds consume 100% of the eggshells included in the prescribed diet (see Captive Dietary Needs above) and does not factor in additional calcium carbonate + Vitamin D3 sprinkled on insects each day.

Part of the courtship process and mate selection process may rely on the female judging males against each other. If possible, set-up birds to foster mate choice with the female in an enclosure between the 2 males. In the wild, researchers noted females leading males to territory boundaries where they would chase and spar with neighboring males.

ADDITIONAL COMMENTS:

Black-and-white warbler eggs have developed with artificial incubation to term, although the chick ultimately failed to hatch. Given the available research, we believe it is the first successful breeding of black-and-white warblers in captivity. The National Zoo has preliminary incubation and hand-rearing guidelines based on this case. When possible, parent-rearing is preferred, but failing health of the female warbler dictated the need for hand-rearing. Incubation of such small eggs require careful monitoring and adjustments of the incubation environment to facilitate the appropriate water loss for egg development.

REFERENCES:

<https://birdsna-org.bnaproxy.birds.cornell.edu/Species-Account/bna/species/bawwar/breeding>

https://animaldiversity.org/accounts/Mniotilta_varia/#reproduction

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Species Fact Sheets

Order: Passeriformes
Scientific Name: *Geothlypis trichas*

Family: Parulidae
Common Name: Common yellowthroat

AZA Management: Green Yellow Red None



NATURAL HISTORY:

Geographic Range: Europe Asia North America Neotropical
 Africa Australia Other

Habitat: Forest Desert Grassland Coastal
 Riverine Montane Other Dense vegetation

Circadian Cycle: Diurnal Crepuscular Nocturnal Other [Click here to enter text.](#)

Cold Tolerance: To 70° F To 60° F To 50° F To 40° F
 To 30° F To 20° F Other Undetermined

Heat Tolerance: To 30° F To 50° F To 70° F To 90° F
 To 110° F Other Undetermined

Diet: Frugivore Carnivore Piscivore Insectivore
 Nectivore Omnivore Folivore Other (Add Below)

Captive Dietary Needs:

Has been successfully kept on a diet of passerine base mix, egg mix, and insects. The passerine base mix includes Mazuri softbill diet, Mazuri insectivore diet, and chopped banana, apples, zucchini, papaya, blueberries, and melons. The egg mix includes chopped hard-boiled egg in the shell and Marion Zoological All-preem parakeet pellets. Insects offered daily include gut-loaded mealworms, waxworms, and gut-loaded crickets. All insects are dusted with a calcium carbonate powder in the winter and calcium + D3 powder in the summer. The diet is changed between the breeding and non-breeding seasons. During the non-breeding season, the birds get 40% of their kilocalories from base mix, 15% from egg mix, and 45% from insects. During the breeding season, the proportion from insects is increased to 60%, the egg mix is increased to 25%, and the base mix is reduced to 15%.

Species Fact Sheets

Life Expectancy in the Wild: Oldest recorded: 11 yrs 6 mos

Males:

Females:

Life Expectancy in Captivity:

Males:

Unknown, but the oldest male in our collection was caught as an adult in 2016 making him over 7 years old.

Females:

Unknown, but the oldest female in our collection was caught in 2016 in her first year making her 7 years old.

BREEDING INFORMATION:

Age at Sexual Maturity:

Males: 1 yr

Females: 1 yr

Courtship Displays:

After pairing the male will follow female closely. Female will flutter her wings and chirp rapidly to solicit copulation from male.

Nest Site Description:

On or near the ground. Will nest on the ground in drier, high-lying areas and above ground in marshy areas where water could inundate nest. Sedges and grasses are used for support and surrounding vegetation help conceal the nest from the sun and predators. The nest is constructed of sedges, grasses, leaves, and other plant material.

Clutch Size, Egg Description:

1-6 eggs, white with grey, lilac, reddish-brown or black markings

Incubation Period:

12 days beginning after laying last egg

Fledgling Period:

Fledges after 12 days

Parental Care:

Only female broods, both sexes feed young

Chick Development:

Altricial

CAPTIVE HABITAT INFORMATION:

Social Structure in the Wild:

Solitary on breeding grounds. Thought to be solitary on wintering grounds, but they have been observed foraging in mixed-species flocks in the Dominican Republic.

Social Structure in Captivity:

They typically do not socialize with other species or conspecifics except in pairs during breeding season. Will tolerate each other in mixed-species flocks during the non-breeding season. Males may become territorial around breeding season.

Minimum Group Size: 1

Maximum Group Size: Not yet determined

Compatible in Mixed Species Exhibits:

Yes

Comments:

Has been successfully kept in off-exhibit holding cages in mixed species groups with other small songbirds. They typically have very few issues with aggression in the non-breeding season but may

Species Fact Sheets

need to be monitored more closely during breeding season.

Optimal Habitat Size: Off exhibit, has been kept in holding cages that are 3.5' wide, 9' deep, and 8' tall but more space is optimal, especially if housing with other birds.

Management Challenges: Some yellowthroats in the Smithsonian's National Zoo & Conservation Biology Institute collection have exhibited intermittent episodes of heavy breathing, often in the fall/winter. A cause for this behavior and reliable treatment has not yet been determined.

We have had some issues with persistent chasing of females during courtship. Pairs may need periods of temporary separation if this occurs to give females a break.

ADDITIONAL COMMENTS:

Common yellowthroats prefer enclosures filled with dense foliage and trees (artificial foliage is acceptable) to provide cover and hiding places.

In the captive collection at the Smithsonian's National Zoo & Conservation Biology Institute we observed a male yellowthroat inspecting and sitting in a completed nest and moving around nesting material. In the wild females are the sole nest-builder. This may be unique to this individual and further observations are necessary.

Materials provided for nest construction:

- dried grasses
- raffia
- coconut fibers
- canary nest cups

REFERENCES:

<https://birdsoftheworld.org/bow/species/comyel/cur/introduction>

https://www.allaboutbirds.org/guide/Common_Yellowthroat/lifehistory

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Western tanager (*Piranga ludoviciana*) by Eric Peterson

Our goal is to continue publishing biannual newsletters, issues for both spring and fall to coincide roughly with the celebration of World Migratory Bird Day. If your facility works with native songbirds, is developing husbandry or breeding protocols, or is providing a permanent home for non-releasable native songbirds, we want to hear from you!

***Please email all materials to an editor by May 1 or
September 1 to be included in the next issue.***

Submission Tips:

- Articles are recommended to be approximately 750 words.
- Pictures should be included where possible.
- Credit the author and organization/facility name.
- Submit materials in Microsoft Word with pictures either attached to the email or within the word document. Don't worry about formatting, that's our job!
- Provide references if applicable.

