SMITHSONIAN'S NATIONAL ZOO AND CONSERVATION BIOLOGY INSTITUTE
BIRD HOUSE FACT SHEET

STATE OF THE BIRDS: WHY BIRD CONSERVATION AND PUBLIC OUTREACH MATTERS

Since 1970, bird populations in the U.S. and Canada have declined by 29%, or almost 3 billion birds, signaling a widespread ecological crisis. The results show tremendous losses across diverse groups of birds and habitats — from iconic songsters such as meadowlarks to long-distance migrants such as shorebirds and backyard birds including sparrows.

- 2019 Study Finds U.S. and Canada Have Lost More Than One in Four Birds in the Past 50 Years
- 2022 U.S. State of the Birds Report Reveals Widespread Losses of Birds in All Habitats–Except for One

THE NEW BIRD HOUSE

NZCBI expert interview: Sara Hallager, Curator of Birds

- Co-chair of the North American songbird conservation program for the Association of Zoos and Aquariums
- Expert testimony on Migratory Local Wildlife Protection Act of 2022

After a 6-year transformation of the 1928 historical building, NZCBI's Bird House reopens as the first zoo exhibition of its size to highlight the annual journeys of migratory songbirds, waterfowl and shorebirds integral to North, Central and South American ecosystems. This immersive new Bird House, and the surrounding plateau, features three walk-through aviaries and highlights how visitors can "live bird friendly" and make lifestyle choices that are best for birds, humans and the planet.

By The Numbers

- Renovated 30,405 square-foot historic Bird House building.
- More than 170 individual birds representing up to 71 species of birds will be on view in the Bird House (56 species) and on the surrounding outdoor exhibits on bird plateau (16 species).
    - Coffee Farm: 27 species; 67 birds
    - Prairie Pothole: 17 species; 46 birds
    - Delaware Bay: 12 species; 58 birds; 14 horseshoe crabs and native fish
    - Outdoor exhibits: 16 species; 75 birds (Note: a portion of the outdoor exhibits on the Plateau may be under construction and all birds may not be on view).
- All water used in Bird House exhibit pools and water features is recirculated and filtered through bead or sand filters; there is a UV sterilizer used on Delaware Bay and Prairie Pothole pools. There is a wave machine in Delaware Bay aviary.
    - Delaware Bay aviary saltwater pool volume 2864 gallons
    - Delaware Bay aviary freshwater pool volume: 1350 gallons
    - Prairie Pothole pools: 1417 gallons
    - Coffee Farm aviary pools: 830 gallons
- The Department of Nutrition Sciences carefully plans and manages diets for all bird species.
    - For songbirds during the breeding season (Spring-Summer): 830,000 crickets, 680,000 mealworms, 260,000 waxworms, 1400 hard-boiled eggs
    - For songbirds during the non-breeding season (Fall-Winter): 504,000 crickets, 406,000 mealworms, 150,000 waxworms, 800 hard-boiled eggs
    - Per year for shorebirds: 44 lbs. krill

About the Building and Renovation

- In keeping with NZCBI's conservation mission, the renovated exhibit was built within the walls of the Zoo's historic 1928 Bird House and designed to meet the Leadership in Energy and Environmental Design (LEED) Gold standards. LEED certification takes place about six months after the exhibit opens.

- Scientists estimate up to 1 billion birds die each year after flying into closed windows in the U.S. and Canada alone. To help prevent these collisions at the Bird House, a ceramic frit pattern with horizontal lines was baked into the exterior face of the building's glass, making it more visible to birds.
- The skylights in the Bird House emit UVB, critical to avian health (see Bird Care Expertise section below for more details).
- The Bird House closed in 2019; the total cost of the 6-year renovation was $69 million, 7% raised by NZCBI.

Songbird and Shorebird Husbandry and Care
Although there is extensive field research on migratory songbirds and shorebirds — species in need of urgent conservation support — little is known about how to care for and breed them in human care. Figuring out what they need to survive, thrive and reproduce creates an essential knowledge base should any of these species require captive breeding for conservation reasons. Combining NZCBI's field and husbandry research will help scientists determine what influences songbird and shorebird survival and ensure the health, well-being and sustainability of wild species in need of urgent conservation support that depend on coastlines and tropical forests.

Bird Care Expertise
NZCBI's Bird House team received the 2019 Plume Award from AZA's Avian Scientific Advisory Group in recognition of demonstrated success breeding native songbirds and development of husbandry expertise to support the recovery of threatened and endangered Western Hemisphere migratory bird populations. Members of the Bird House animal care team are also involved in leading AZA's North American Songbird Working group to share knowledge on how to keep and propagate native songbirds. NZCBI's Bird House Curator is the co-chair for the SAFE North American Songbird program.

Highlights of research and standards of nutrition and care developed by the Bird House team:

- Studying and adapting species' natural ecology and biology to provide species-appropriate enrichment in enclosures and ensure the birds' environment is adequately stimulating.
- The skylights in the Bird House emit UVB, critical to avian health, as light is a primary component in a bird's sensory environment, affecting vision, circadian rhythms and metabolic processes. In aviculture, photoperiod, temperature, humidity and diet have traditionally been considered key factors requiring precise management for breeding programs. The eyes of most diurnal birds are enabled for light perception in the UV spectrum — they can see colors humans cannot which is important for breeding, mate selection, food choice and calcium metabolism.
- Migratory birds are primed to gain weight during key points in their annual migration cycle, enabling them to fly thousands of miles to reach their breeding grounds in spring or wintering grounds in fall. Migratory songbirds in human care exhibit the same physiological weight change. This requires a careful approach to feeding them to ensure they do not become overweight.
    - Food items are adjusted to replicate what nutrients birds eat at specific times in their annual cycle. For example, in spring and summer, protein, fat and calcium are all increased, in large part by increasing the number of insects in bird diets. In fall and winter, carbohydrates are increased as produce consumption goes up and insect consumption goes down. Oftentimes, we only need to increase calories when parents are raising chicks. Otherwise, the nutrient adjustments alone meet their seasonal needs.
        - Related content: Is The Secret to Saving Migratory Birds in the Meal Prep?
- To encourage breeding, birds are offered a variety of nesting materials: cotton, raffia, woven grass, hay, twine, mud and even hair sheared from alpacas at the Kids' Farm.

Breeding Program

Understanding husbandry and aviculture breeding requirements is an essential and timely component in response to declining bird populations. Species propagated in human care at NZCBI's Bird House:

- Baltimore oriole
- Swainson's thrush
- Wood thrush
- Indigo bunting
- Scarlet tanager
- Yellow-breasted chat (the first hatch of the Eastern subspecies in human care)
- Rose-breasted grosbeak
- Grasshopper sparrow
- Song sparrow
- Egg laying in several species of warblers including common yellowthroat, magnolia warbler, black and white warbler, black throated blue warbler and ovenbird.

Walkthrough Aviaries

Shorebird Aviary: Delaware Bay
The first aviary has two saltwater and two freshwater pools. The aviary emphasizes seasonal changes in the availability of food as the driving force of migration. Red knots and other shorebirds live together in an open marsh pond and beach with live horseshoe crabs and native fish. Interpretive graphics help explain why the Delaware Bay is a prime example of an essential refueling station for birds.

Delaware Bay Aviary Species

American avocet	*Recurvirostra americana*
red knot	*Calidris canutus*
ruddy turnstone	*Arenaria interpres*
dunlin	*Calidris alpina*
semipalmated plover	*Charadrius semipalmatus*
semipalmated sandpiper	*Calidris pusilla*
sanderling	*Calidris alba*
short-billed dowitcher	*Limnodromus griseus*
song sparrow	*Melospiza melodia*
Carolina wren	*Thryothorus ludovicianus*
blue-winged teal	*Anas discors*
black-capped chickadee	*Poecile atricapillus*
white-throated sparrow	*Zonotrichia albicollis*
horseshoe crab	*Limulus polyphemus*
mummichog fish	*Fundulus heteroclitus*
pumpkinseed fish	*Lepomis gibbosus*

Waterfowl Aviary: Prairie Pothole
Leaving the Delaware Bay, visitors enter the prairie pothole region of the upper Midwest, temporary wetlands that fill with snowmelt and seasonal rains. Pools line both sides of the curved walkway. Ducks thrive in this landscape abundant with food and extensive grasslands that safely conceal nests. Guests learn that many waterfowl populations have rebounded due to dedicated conservation efforts, though this wetland breeding habitat is among North America's most threatened ecosystems.

Prairie Pothole Species

grasshopper sparrow	*Ammodramus savannarum*
red-winged blackbird	*Agelaius phoeniceus*
yellow warbler	*Setophaga petechia*
Northern pintail	*Anas acuta*
green-winged teal	*Anas crecca*
blue-winged teal	*Anas discors*
ruddy duck	*Oxyura jamaicensis*
redhead	*Aythya americana*
Northern shoveler	*Spatula clypeata*
American wigeon	*Mareca americana*
canvasback	*Aythya valisineria*
bufflehead	*Bucephala albeola*
song sparrow	*Melospiza melodia*
Carolina wren	*Thryothorus ludovicianus*
American robin	*Turdus migratorius*

Songbird Aviary: Bird Friendly Coffee Farm

Entering the third immersive aviary, songbirds flit among canopy trees that grow above coffee plants, representing a traditional, rustic coffee farm. Visitors learn how the type of coffee they consume can impact migratory birds, because the quality of migratory birds' overwinter habitat affects the success of their migration and breeding.

Coffee Farm Aviary Species

band-tailed pigeon	*Patagioenas fasciata*
black-and-white warbler	*Mniotilta varia*
black-throated blue warbler	*Setophaga caerulescens*
black-throated green warbler	*Setophaga virens*
black-bellied whistling duck	*Dendrocygna autumnalis*
blue grosbeak	*Passerina caerulea*
blue ground dove	*Claravis pretiosa*
cedar waxwing	*Bombycilla cedrorum*
common yellowthroat	*Geothlypis trichas*
gray catbird	*Dumetella carolinensis*
indigo bunting	*Passerina cyanea*
barred parakeet	*Bolborhynchus lineola*
magnolia warbler	*Setophaga magnolia*
northern oriole	*Icterus galbula*
orchard oriole	*Icterus spurius*
ovenbird	*Seiurus aurocapilius*
red-eyed vireo	*Vireo olivaceus*
rose-breasted grosbeak	*Pheucticus ludovicianus*

rufous crowned sparrow	*Aimophila ruficeps*
scarlet tanager	*Piranga olivacea*
Swainson's thrush	*Catharus ustulatus*
Tennessee warbler	*Vermivora peregrine*
white-eyed vireo	*Vireo griseus*
wood thrush	*Hylocichla mustelina*
yellow-rumped warbler	*Dendroica coronata*
yellow-breasted chat	*Icteria virens*
ruddy quail dove	*Geotrygon montana*

Outside Exhibits on Bird Plateau
The outdoor plateau surrounding the Bird House predominantly features birds of the Western hemisphere. At the time of the Bird House opening in mid-March some outdoor bird exhibits will still be under renovation (ibis, spoonbills, seriema, curassow and wood duck will not be on display).

Outside Yards Species

southern cassowary	*Casuarius casuarius*
greater rhea	*Rhea americana*
whooping crane	*Grus americana*
standard bronze turkey	*Meleagris gallopavo*
Ross's goose	*Chen rossii*
American flamingo	*Phoenicopterus ruber*
Redhead	*Aythya americana*
white-cheeked pintail	*Anas bahamensi*
scarlet ibis	*Eudocimus ruber*
red-legged seriema	*Cariama cristata*
roseate spoonbill	*Ajaia ajaja*
kori bustard	*Ardeotis kori*
barred owl	*Strix varia*
sandhill crane	*Grus americana*
blue-billed curassow	*Crax alberti*

Bird House Banding Station
- Smithsonian scientists routinely capture wild birds on NZCBI grounds as part of their research. The birds are weighed, measured, banded and released.
- At the new Bird House banding station, trained professionals will show visitors how they safely hold, band and then release a bird. By letting visitors get close to a wild bird during the banding process, NZCBI hopes to inspire them to care for and want to conserve these magnificent species.

Bird Collection
The migratory shorebirds and songbirds on exhibit in the new Bird House are a mix of wild, captive born and rehabilitation-sourced birds. The waterfowl are all captive born.

- NZCBI sourced birds from rehab centers, research collections, non-AZA and AZA-accredited facilities wherever possible.
- Relative to the wild populations, some of which still number in the millions, NZCBI acquired wild birds where the removal for breeding and exhibition would not be detrimental to wild populations.
- Collection followed sound conservation principles, met all USDA legal and permit requirements and was in accordance with the NZCBI's acquisition policy and procedures.