



Let's begin a **featherful**
wonderful journey 

Thesis project April 2023 by Wooyo Jin
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About me

Hi, I'm **Wooyo Jin** from china.
She/her/hers pronouns.

Had science + engineering degrees on Wood
Science and Products Processing.

An animal lover, + a doodler + a social designer.
I wish to build a Zootopia in the modern
environment, where we can hum and live with
urban wildlife as our nature intended!



It shocked me!

When I first came to New York City, I saw the squirrels, pigeons and a lot of animals I could not name walking by leisurely and carefree, which impressed me a lot. Because back in my hometown Tianjin, China, we can rarely see wild animals, they will be scared away before we get closer. While In New York, the pigeons will only care about their own business and there's no point to escape.

I really like this kind of coexistence between humans and wild creatures. I believe this is a great treasure in our live. It seems like we are full of tolerance and respect for each other. I want more. More animals, more species, more diversity around us.



NYC: a city of feathers



Every year, during both Fall and Spring, numerous North American bird species embark on a biannual migration that takes them on a quest for food and opportunities for reproduction. During Fall, they migrate South towards milder weather and regions with abundant food. In Spring, they make their way North to reach their breeding grounds. These migratory paths can be broadly classified into 4 flyway systems, resembling highways, as depicted in the figure.

The Atlantic Flyway is one of these systems, which runs along the eastern coast of the United States, with significant migration routes crossing Southern South Carolina and the Delaware Bay. New York State, encompassing New York City, is situated within this particular flyway.

Every spring and fall,
millions of birds migrate
through NYC.

Every year,
more than **200**
different bird species
frequent NYC.

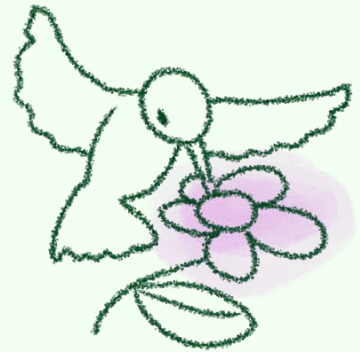
We include...



Image source: the Cornell Lab

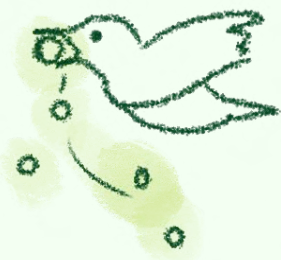


We mean a lot!



For pollination

While birds are not typically the primary pollinators of plants, they do play a role in pollination for certain plant species. For instance, hummingbirds are known to pollinate flowers by transferring pollen while feeding on nectar.



For seeds dispersion

Birds help in the dispersal of plant seeds through their digestive system. When they eat fruits and berries, they swallow the seeds, which are then deposited in their droppings, allowing them to colonize new areas and increase the genetic diversity of plant populations.



For pest control

Birds are natural pest controllers and can help control populations of insects, rodents, and other animals that damage crops and spread disease. Hawks, falcons, owls, swallows, and warblers are some bird species that are skilled at hunting and consuming pests like rodents and insects.



As ecosystem indicators

Scientists can use bird populations and behavior as indicators of environmental changes such as habitat loss, pollution, and climate change.



For human's mental well-being

Birds can give a sense of connection to nature and offering opportunities for relaxation and stress relief. They provide songs and add pops of color that are aesthetically pleasing. Research has shown that watching birds can help to reduce stress and anxiety, lower blood pressure, and improve mood and cognitive function.



For birding industry

Birding means bird watching. Watching birds has a significant economic impact, with nearly \$100 billion generated, and over 45 million people in the United States participate in this activity. Additionally, specific bird species have the potential to contribute significantly to the economies of local communities.

However, ...

the city is **killing** birds!



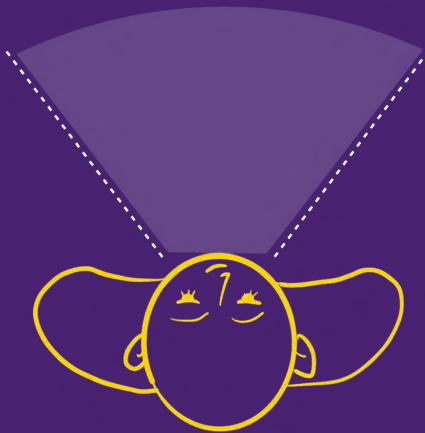
Photo: Nancy Barrett

According to NYC Audubon's research, each year, a significant number of migrating birds **between 90,000 and 230,000** perish in New York City due to collisions with building glass. Artificial lighting exacerbates the issue by confusing birds that migrate at night.

As humans, we used to be predators. Much like other predators like wolves, lions, and bears, our eyes are located at the front of our heads, providing us with excellent depth perception. Predators have binocular vision and can estimate distances when hunting.

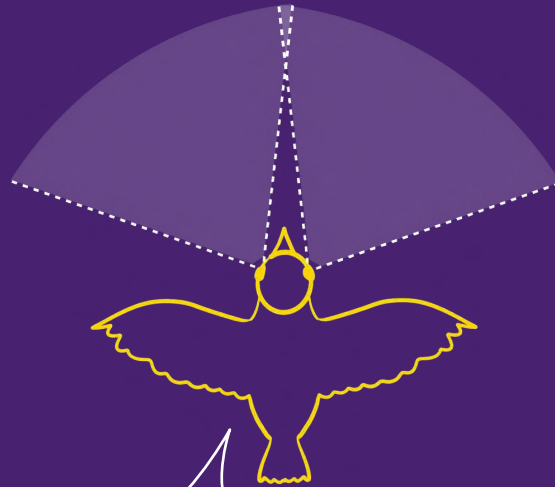
Human's Vision

Good depth perception ahead



Bird's Vision

Poor depth perception ahead



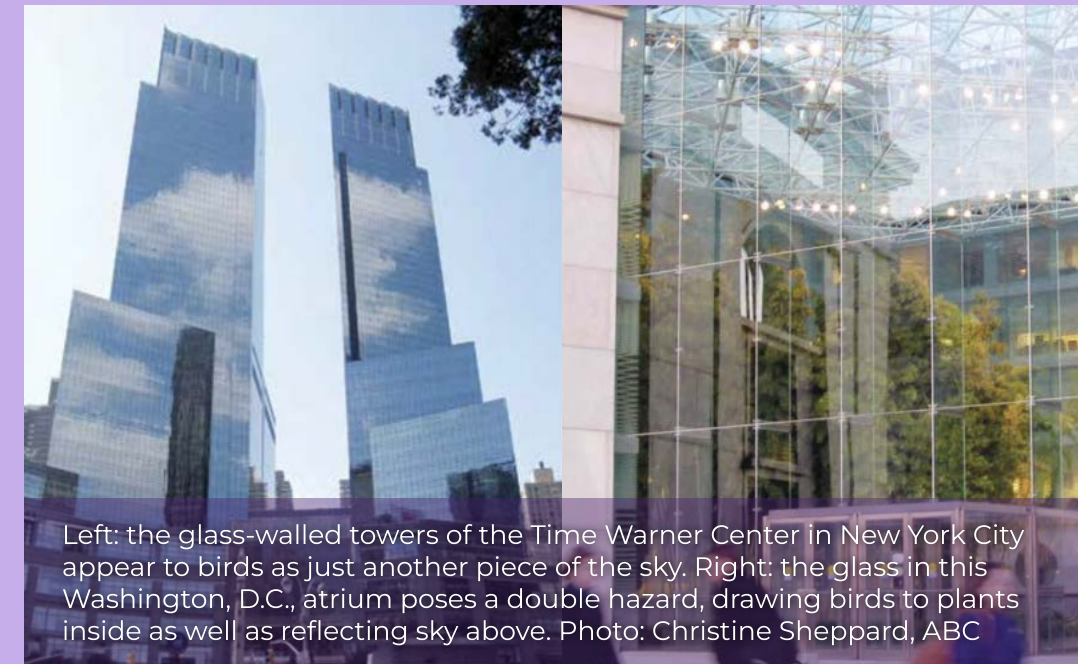
Birds, like other prey animals such as rabbits, deer, and squirrels, have eyes placed on the sides of their heads with a wide visual field, useful for detecting predators. During flight, birds judge their speed by the passing of objects on either side of them. So their focus in flight is not necessarily ahead.

How do collisions happen?



Photo: Sophie Butcher

Due to poor visual perception ahead, birds often mistake reflections on glass windows for the sky, vegetation, or their habitat, leading them to fly directly into the glass surface. This confusion is a common cause of bird collisions.



Left: the glass-walled towers of the Time Warner Center in New York City appear to birds as just another piece of the sky. Right: the glass in this Washington, D.C., atrium poses a double hazard, drawing birds to plants inside as well as reflecting sky above. Photo: Christine Sheppard, ABC



In 2010, thousands of birds became trapped in the powerful beams of the Tribute in Light. Photo: NYC Audubon

Even though most collisions happen during the day, the level of artificial night-time light that a building emits is a significant predictor of the number of bird collisions it may cause.

Collisions are happening more than we found

What's more frustrating, after the collision, birds may flee, hide, and die in other places, or, other wild predators might grab the body before we discover it. Therefore, many people don't know this issue exists.

What if we lost all birds?

Imagine a world where the melodious chirping of birds is absent from the bustling cityscape of New York. No feathered friends to greet you with their sweet songs or take to the skies in search of food or shelter.

The consequences would extend beyond the mere absence of avian companionship. The ecosystem itself would be thrown into disarray, with a domino effect of imbalances and unintended consequences. Without birds, pollination, seed dispersal, and insect control would suffer, leading to a decline in the flora and fauna that thrive in the concrete jungle. The absence of these natural helpers could lead to a rise in pests and predators, disrupting the delicate balance of nature.

Without their cheerful presence, the city would feel less alive, less vibrant, less...human and other creatures.

But the loss would be felt beyond the realm of nature. For birds, with their vibrant plumage and joyous songs, have always been an integral part of the cultural fabric of New York. In short, the loss of birds in NYC would be a tragic blow to the very soul of the city, leaving a lasting and melancholic void that could never be filled.



So I want to ask:

How might we make NYC
become more **bird-friendly** to
improve the quality of urban
livability for **people and birds**
with better coexistence?

Research

- 3** data visualizations
- 20** surveys + intercepts
- 6** birdwatchings
- 5** conversations

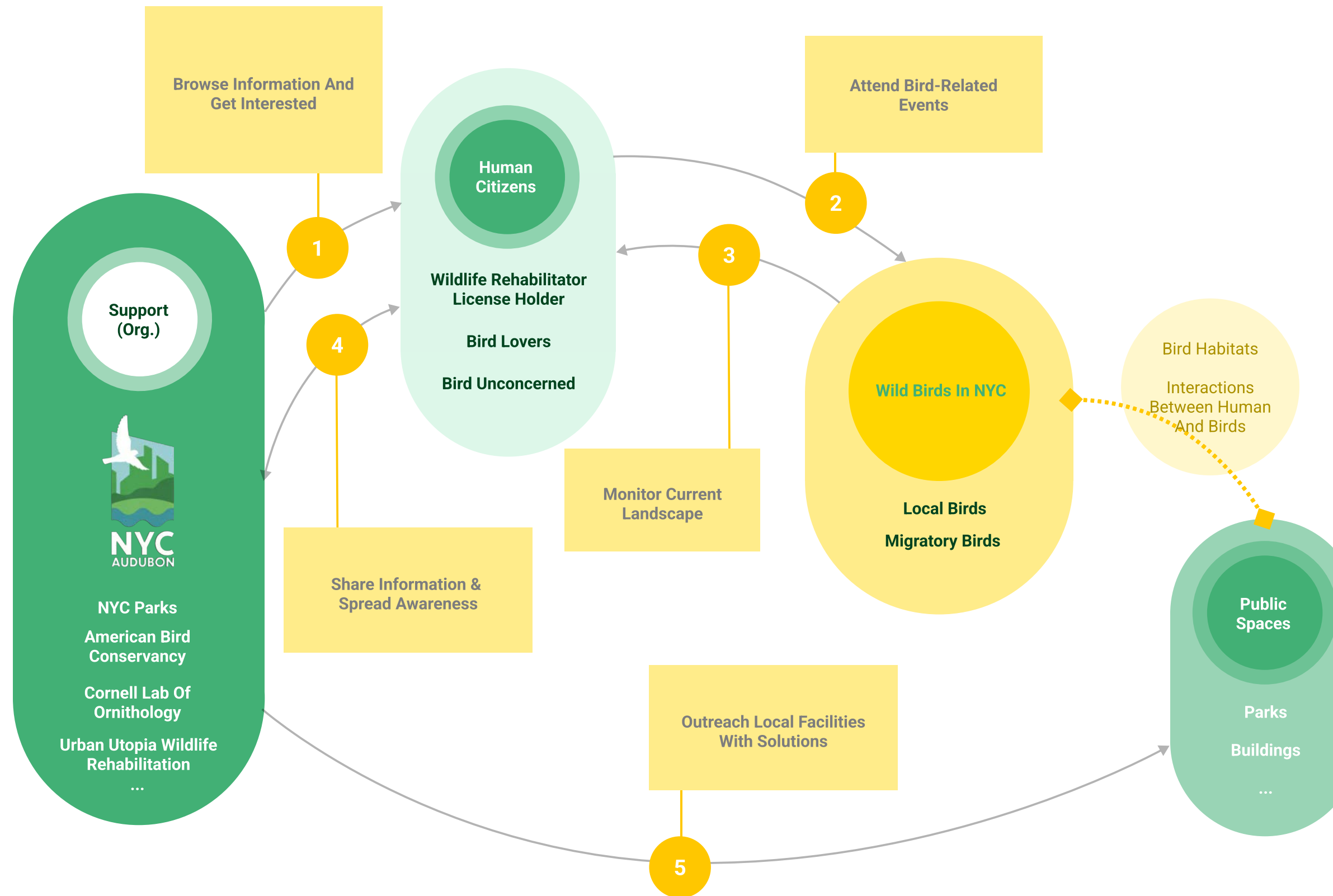
Ecosystem & User Journey Map

How local efforts engage in bird conservation?

The current landscape is one that emphasizes the crucial role of Non-profit NYC Audubon, among others, in preserving and safeguarding birds and their habitats throughout NYC.

These organizations are instrumental in sharing knowledge and organizing bird-related events for the public to participate in. Through birding and volunteering programs, citizens can assist professionals in monitoring the birds' situation throughout the city for scientific research.

In addition, they reach out to government officials and local buildings, advocating for bird-friendly designs in construction. This ensures that buildings are designed with features that help prevent collisions and other threats to birds.



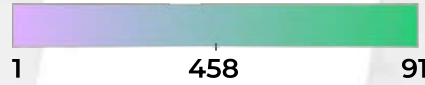
Reach out to thesis partner

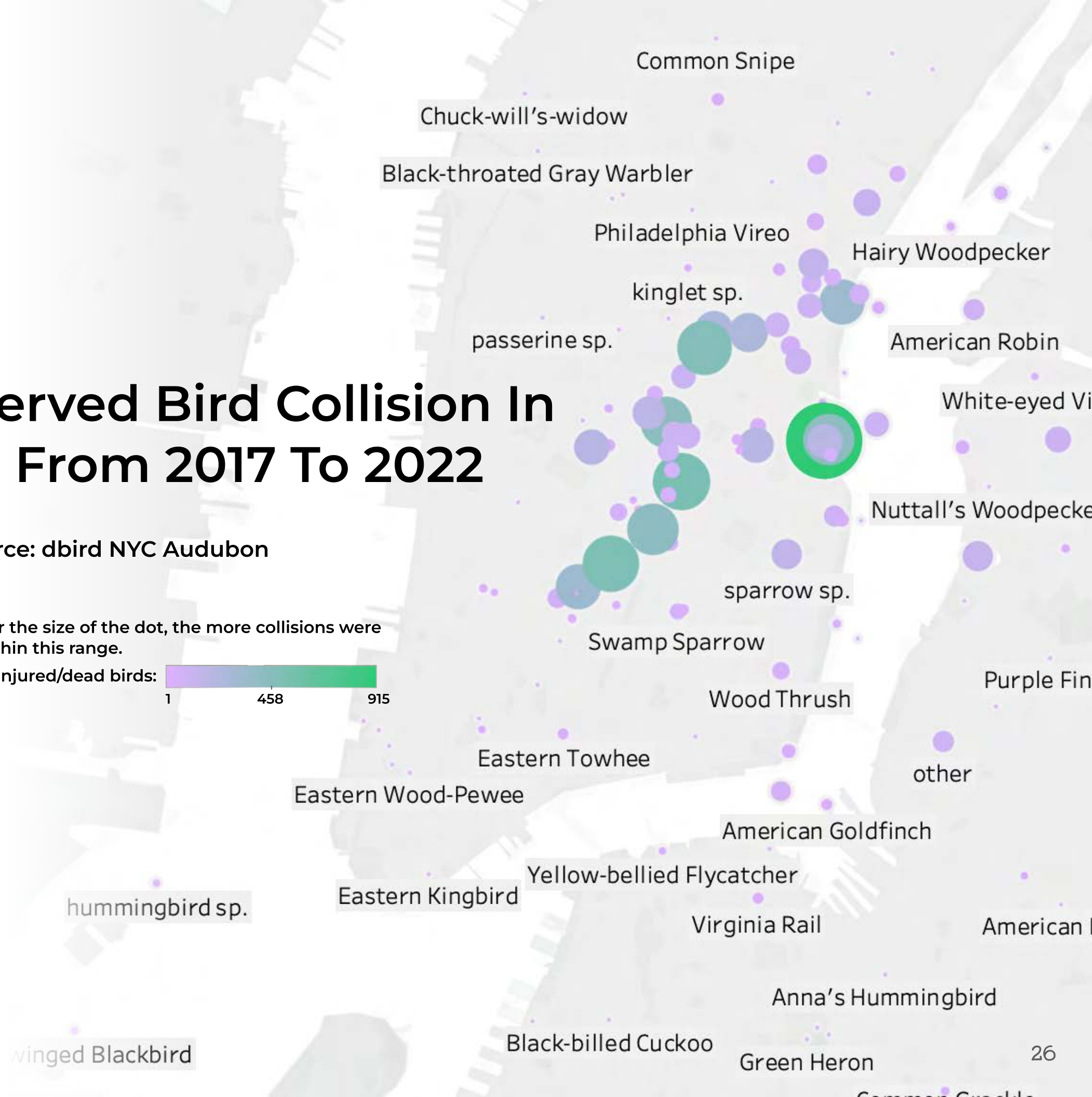
I am incredibly grateful to NYC Audubon for generously providing me with their comprehensive data on bird collisions. This data has allowed me to gain a more nuanced understanding of the severity of this issue, both historically and in the present day.

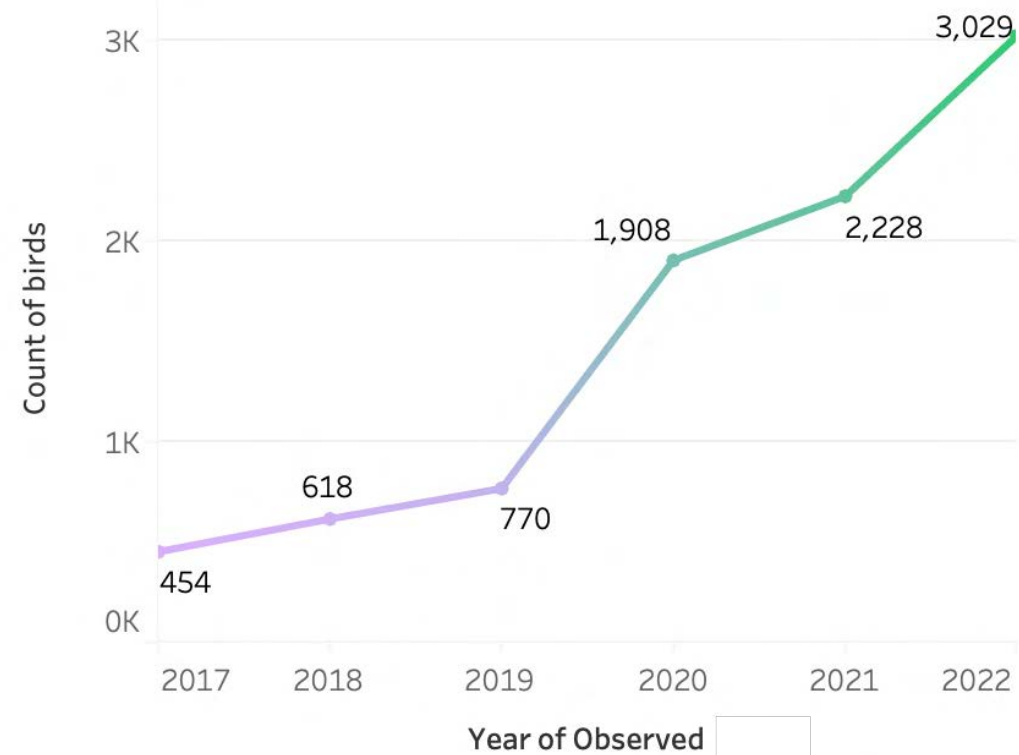
Using the powerful data visualization tool Tableau, I was able to create an interactive and visually compelling map of New York City. The map displays the number of injured and dead bird reports throughout 2017 to 2022, as well as the trend of the number of injured and dead bird records over time.

Observed Bird Collision In NYC From 2017 To 2022

Data source: dbird NYC Audubon

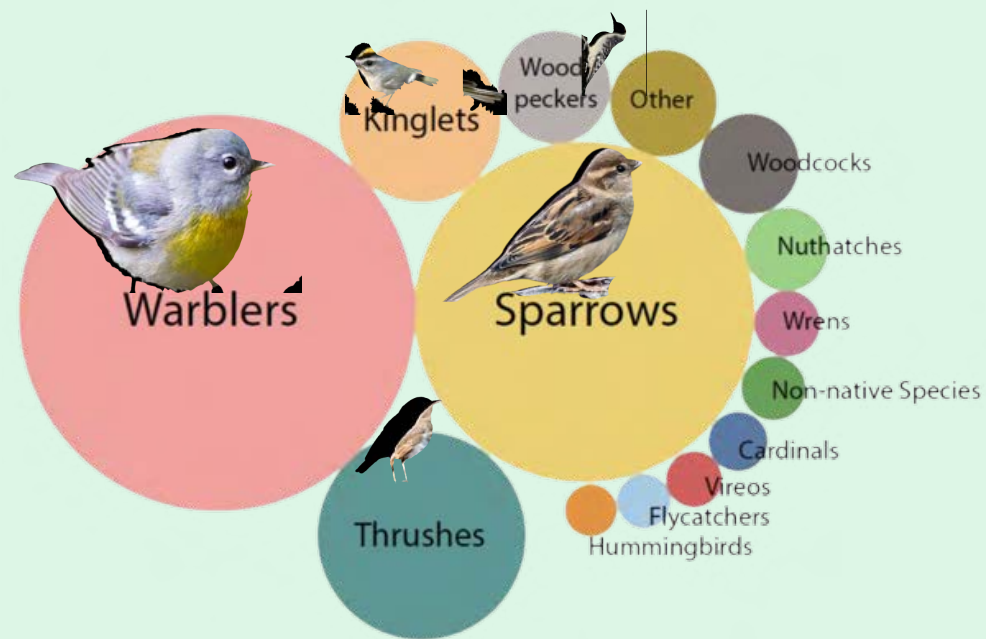
- The larger the size of the dot, the more collisions were found within this range.
- Count of injured/dead birds:  1 458 915





Annual Number Of Injured And Dead Birds In NYC From 2017 To 2022

Data source: dbird NYC Audubon

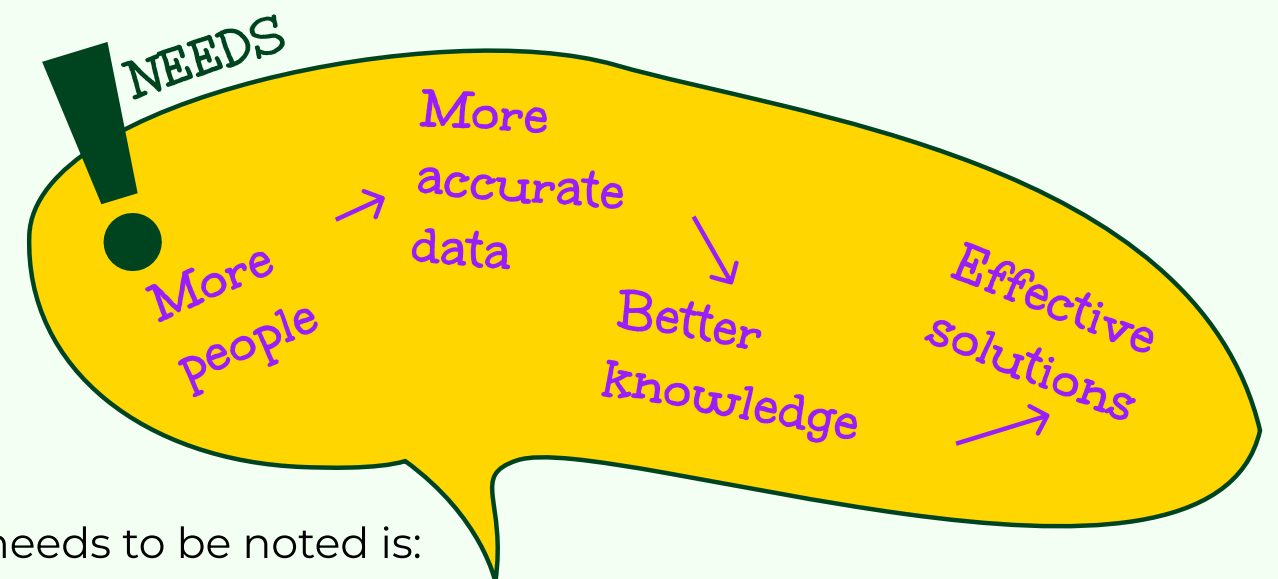


Top Collision Victims In NYC Since 1997

Data source: dbird NYC Audubon

This line chart on the left (annual number of injured and dead birds in NYC from 2017 to 2022) shows the trend of the number of injured and dead bird records over time.

Obviously, the victimized number has been increasing since 2017 to 2022.



What needs to be noted is:

Collecting this data mainly relies on manpower

like local efforts, volunteers, and bird watchers who go to different locations in person to observe and record birds. So the reasons for this increase may be twofold:

- First. As more people, including me, participate in monitoring birds every year, more numbers of victimized birds are discovered.
- Second, the number is indeed increasing year by year caused by human buildings.

In any case, both reasons highlight the urgent need for more resources and people to obtain more accurate data, to better understand the current situation of birds in the city, and develop effective solutions to protect them.

The existing solutions

Project Safe Flight by NYC Audubon

In 1997, Project Safe Flight (PSF) was established. Today, over two decades later, the initiative has grown to include several complementary components with the goal of reducing bird fatalities resulting from window collisions in New York City.

This effort supplements our online dBird data collection tool, allowing us to maintain a comprehensive and ongoing data set. By analyzing this information, we can identify buildings in the City that pose the greatest danger to birds and utilize the evidence to advocate for change, whether it be practical solutions for specific structures or broader policy advancements.



A stunned male Chestnut-sided Warbler is gently collected by a Project Safe Flight collisions monitor, before being taken to a rehabilitation.

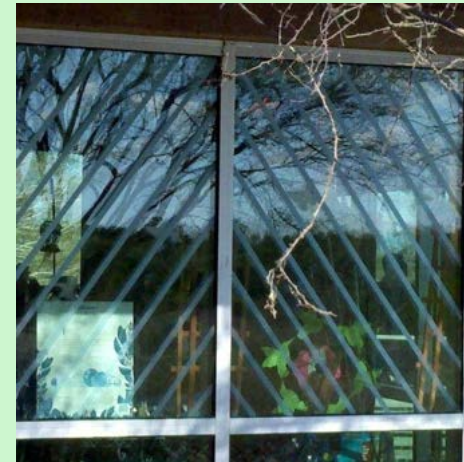
Photo: Sophie Butcher

Bird-friendly window

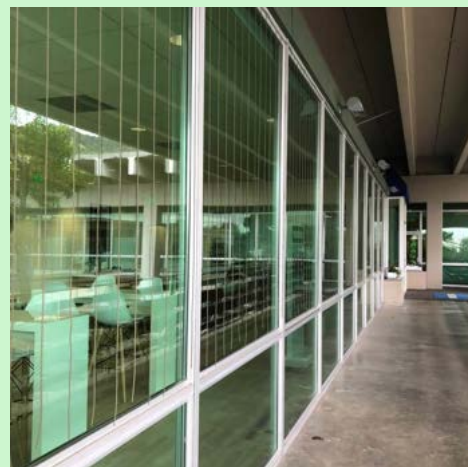
Bird-friendly window designs are a fantastic way to help protect birds from building strike. By incorporating features such as frosted glass, UV-reflective materials, and clever screens or netting, we can create spaces that are both safe and beautiful.



Adhesive white/grey squares installed in strips



Translucent tape



Hanging cords



...
Other window reforming solutions



Legislation

INT 1482 was passed by the City Council in late 2019, mandating the use of bird-safe glass for new construction and major alterations as a measure to prevent bird fatalities.

Council Member Rafael L. Espinal Jr., who introduced the legislation, highlighted the importance of NYC's location along a major bird migration route, noting the significance of the bill for the city's environmental legacy.

The NYC Audubon Society reported a 90% decrease in bird mortality at the Javits Center after bird-friendly materials were installed.

Survey & intercepts

How is the public's attitude toward urban birds in NYC?

I was also curious about the public's attitude toward urban birds because it helps us understand how people perceive and interact with the natural environment around them. Public awareness and concern about these issues can help drive efforts to mitigate them. By understanding the public's knowledge and attitudes toward urban birds, we can develop effective strategies to engage and educate people about bird conservation and encourage actions that benefit both birds and people.

I conducted a survey in several parks and got about 20 responses, unfortunately, only two individuals were aware of bird collisions.

Only 2 out of 20 individuals were aware of bird collisions



COMMUNITY BIRD SURVEYS

This survey is designed to gather information about people's understanding of birds in New York City. The purpose of this survey is to assess the level of awareness and involvement in bird conservation efforts among the general public, as well as to identify areas where further education and outreach may be needed. Your participation in this survey is voluntary and anonymous, and your responses will be kept confidential.

Instructions: Please read each question carefully and select the answer that best represents your views. There are no right or wrong answers, and all responses will be valuable in helping us better understand the public's perspective on bird conservation in NYC. The survey should take approximately 5-10 minutes to complete.

Thank you for your participation! Your feedback will help us make informed decisions about how to best protect and coexist with the bird populations in New York City ;)



Survey & intercepts



According to the survey, **People think birds are important on emotional, environmental, economic, and cultural aspects.**

The emotional aspect was mentioned the most, where there are opportunities. New Yorkers are able to sense the intrinsic values of birds. So what we need to do is to transform them into a change.

Meet birds

Birding, also known as birdwatching, is the activity of observing and identifying birds in their natural habitat. It involves studying birds' physical characteristics, behavior, and vocalizations to identify species and learn about their habits. Birders use a variety of tools, such as binoculars, spotting scopes, field guides, and cameras, to aid in their observations. Birding can be a recreational activity, a scientific pursuit, or a way to appreciate and connect with the natural world.

I attended several birding activities to learn what birds call in several parks of NYC. They were on the water, on the grass, in the sky, and also on the Pepsi cola sign.

I also did some bird journaling. Bird sketching helped me understand the anatomy of birds.

These activities cultivated my patience and mindfulness to notice the details of the birds' behavior and movements. I developed a deeper appreciation and connection for and with the natural world and the biodiversity it contains. They can be a reflective practice that promotes my personal growth and self-awareness, as I reflected on my observations and experiences in nature.



Bird journaling



A bird nest on tree branch



Binoculars for birding



Mallard couple



Bird group resting on Pepsi Cola sign along the East River

Meet Michelle Fehler



Michelle Fehler is a Clinical Assistant Professor and Biomimicry Professional. During the interview with her, she raised three keywords associated with coexistence with nature, as following:

Biophilia

The innate human instinct to connect with nature and other living beings.

Ethos

We are part of this system, and if the system thrives, then we thrive, the system is challenged, we are going to be challenged.

Awe

Standing in nature inspires a sense of awe, which is a psychological phenomenon feeling that we have to nurture and live in a relationship with.

How to cultivate people's mindset of coexistence with wildlife?

EGO

ECO

“

If we understand more about the organisms around us, and we start to value them, we will treat them in the same way, generously, and carefully.

”

Michelle Fehler

Conversations

“ Birds may be suffering around us,
but we are not aware of it. ”

Jenna Marie Otero
Environmental Education Assistant at NYS
Office of Parks

“ Urban wildlife is not only an
essential component of a thriving
ecosystem, but also a source of
inspiration for our artistic endeavors. ”

Monica Schroeder
Scientific Illustrator, Medical Copywriter &
SEO Strategist

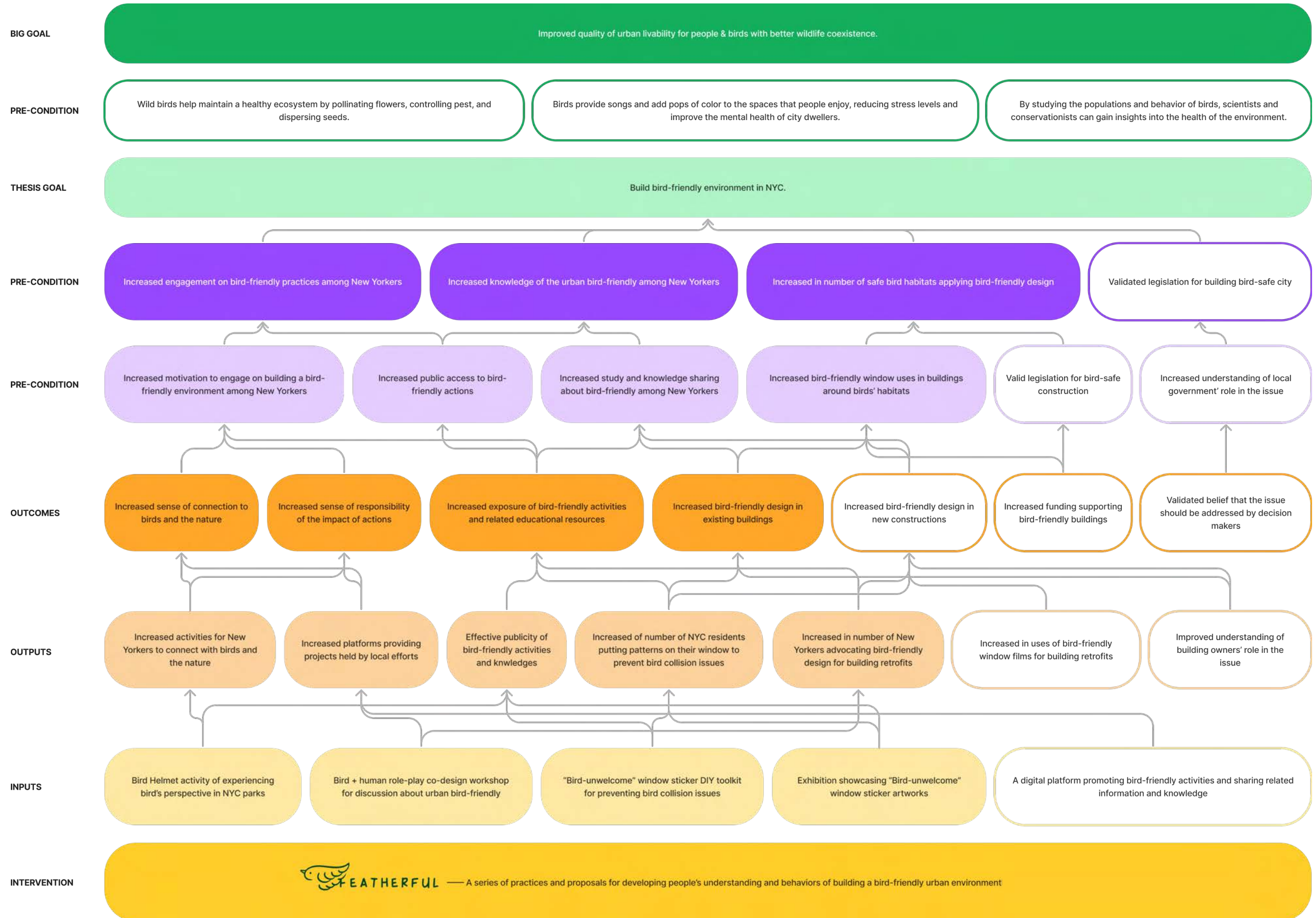
“ I love animals and enjoy working with them in
various capacities. The relationship between
humans and animals is fascinating. We should
contribute to creating an urban environment
that fosters coexistence among all species. ”

Katherine Chen
Community Science & Outreach Manager at NYC Audubon

“ I'm a birder and more of a
storyteller. Interpreting ecology is to
explore the relationship between
people and our environments. ”

Gabriel Willow
Naturalist, environmental educator and
ecological tour guide for NYC Audubon and
Wave Hill

Theory of change



Theory of change narrative

My goal

I wish to Improve quality of urban livability for people & birds with better wildlife coexistence. And my thesis goal is to build bird-friendly environment in NYC.

My assumptions

To achieve this goal, this TOC processes the following 3 pre-conditions: 1. Increased in number of people engage on bird-friendly practices; 2. Increased knowledge of the urban bird-friendly; 3. Increased in number of safe bird habitats applying bird-friendly design.

The first pre-condition requires increased motivation of people to engage on building a bird-friendly environment and increased public access to bird-friendly actions. This needs building connections between humans and birds to raise awareness and understanding of urban bird-friendly practices. Secondly, there needs to be increased study and research on the landscape of bird populations in the city. This should be based on bird data gathered and shared by professionals, volunteers, birders, and other grassroots organizations. For the third one, it is significant to increase the number of bird-friendly buildings in the city. This requires raising awareness and knowledge of efficient solutions for bird-friendly building retrofits.

Mindset shift and behavior change

In general, to attain the three pre-conditions above, after increased public awareness about bird conservation, it is crucial to further cultivate a genuine sense of empathy towards birds as well as spread knowledge of effective bird-friendly practices. As New Yorkers are exposed to local efforts on bird conservation and witness more applications of bird-friendly windows, people will better understand the challenges birds face in urban environments and be more motivated and more confident to participate in bird conservation actions. Moreover, In order to act differently, people need to see differently. Novel way of engagement can develop a sense of empathy, leading to a shift in mindset and a change in behavior. Therefore, by offering immersive and captivating activities that experience birds' unique visual and behavioral traits, we can strengthen the emotional bond between people and birds and encourage individuals to adopt bird-friendly behaviors in their daily lives.

Featherful, my intervention

My project, Featherful, aims to build a bird-friendly environment in NYC through a series of input prototypes, practices, and proposals developed with community partners. They are designed to develop empathy and connection with birds, to increase awareness among New Yorkers, to promote the idea of urban bird-friendly and advocate for bird protection, to exchange knowledge, questions, or news about city birds for better solutions.



Spread the wings: my prototypes



Chapter 1: when I'm still a human

“

The planet does not want to be saved. Or rescued.
Or even changed. Our planet wants to be loved.
Love is not a game of numbers and spreadsheets,
checks and balances, debts and contracts. It is an
exalted dance of joy, respect and gleeful, mutual
appreciation and true partnership”

Ed Gillispie



Seedy's

To explore the birds in the city, the very first step is to **reconnect myself to the nature** where we all are living with.

I made a bird feeder and placed it in Madison Square Park (E 23rd - 26th, 11 Madison Ave) to do observation.



During the observation, it was unwelcome at the beginning. No birds were interested in it. Since my feeder was not popular, I felt a little bored and began to imitate bird singing, which was not working as well. Fortunately, it was visited by some Gray Catbirds after I relocated the feeder from tree branch to the ground deep in the bushes.



2 interesting encounters

Lo and behold, a square staff came out of nowhere and about to toss my bird feeder away! I was so anxious that he would judge or even fine me for feeding the wild. But to protect my feeder, I explained to him that it was all for school work, and he was like, "It's totally all right!" He then suggested that I hang the feeder on a tree and cover it with more food to attract more birds. And get this, he even broke a branch off the tree to better hand the feeder. However, birds still prefer to find food on the ground (which spilled by the staff). Some lady sitting next to me raved "they were chasing the sun on the ground!" I had to tell the truth that they were just chasing the food

There were many people sitting here chatting. And some people (like the lady next to me) sitting here alone and doing nothing (may be a lot of things in their minds). I decided to strike up a conversation with her. It turns out that she often visited the park alone, especially during the pandemic when socializing was limited. She used to have a bird that she raised as her son for 19 years until he passed away during the pandemic. It was a difficult time for her, and she was still grieving. That was about 80 year-old for a bird. The lady had nothing to help but seeing the bird's legs getting worse day by day. It was just the aging. We chatted until it was going to snow.

Reflections:

As I was surrounded by a flock of birds, I felt as if I were in a scene of a Disney movie where the princess is always accompanied by wild animals. This practice was incredibly enjoyable and exceeded my expectations. In addition to observing the wild birds around the feeder, I also saw people walking their dogs, some passing through, and others spending the entire day in the park. The opportunity to spend time with the birds and converse with people enjoying their time in the park was a truly wonderful and natural experience. It was clear that nature was an integral part of their lives.



Volunteering for PSF

I was honored to have been a volunteer for the Project Safe Flight (PSF) 2022 migratory season. During the season, everyday we went to different buildings with high bird collision risks to monitor and record if there were any incidents of bird collisions, injuries, and deaths, as well as recording the location, temperature, weather condition, time, bird species.

We ambled along the sidewalk, meticulously scanning the pavement from the base of the building wall to the gutter, in search of any deceased or wounded birds. We examined any nearby bushes or planters that could potentially harbor injured birds. We made sure to inspect the area beneath trees on the buildings' sidewalks, as injured birds may fly to a tree before perishing.

If we found any injured bird that was still alive, we would carefully placed them in a paper bag and took it to an animal rescue center.



A building under my monitoring in Dutch Kills

A building under my monitoring in Dutch Kills



Project Safe Flight 2022 group



Project Safe Flight Volunteer Appreciation Party on 2/15/2023



Thanks to the project:

Feather Friendly window product was installed June 2022 on a Hotel Brooklyn Bridge and the collisions reduced by nearly two-thirds.

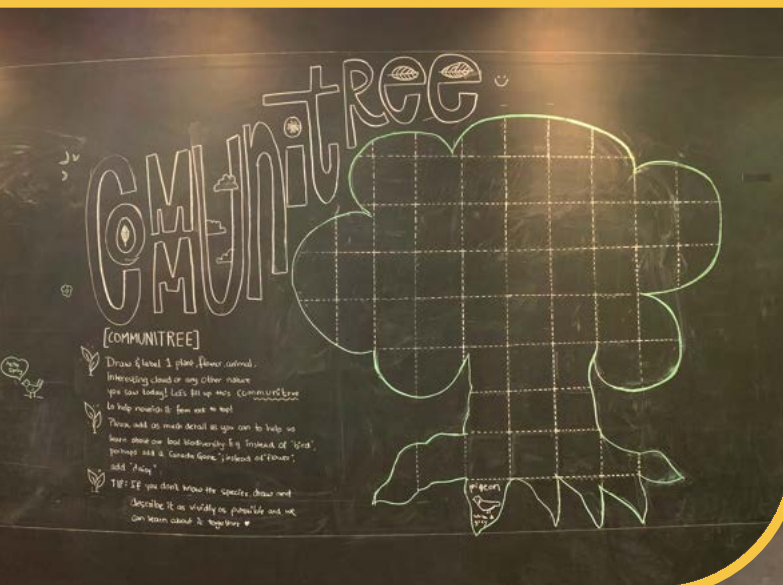
BirdDivert (a UV film) installed at Liberty Street Bridge mid-May 2022 and the collision reduced by over 50%.

Lights Out protocols happened at Convene to advocate public to turn off light to prevent window collisions and the collisions reduced by over 75%.

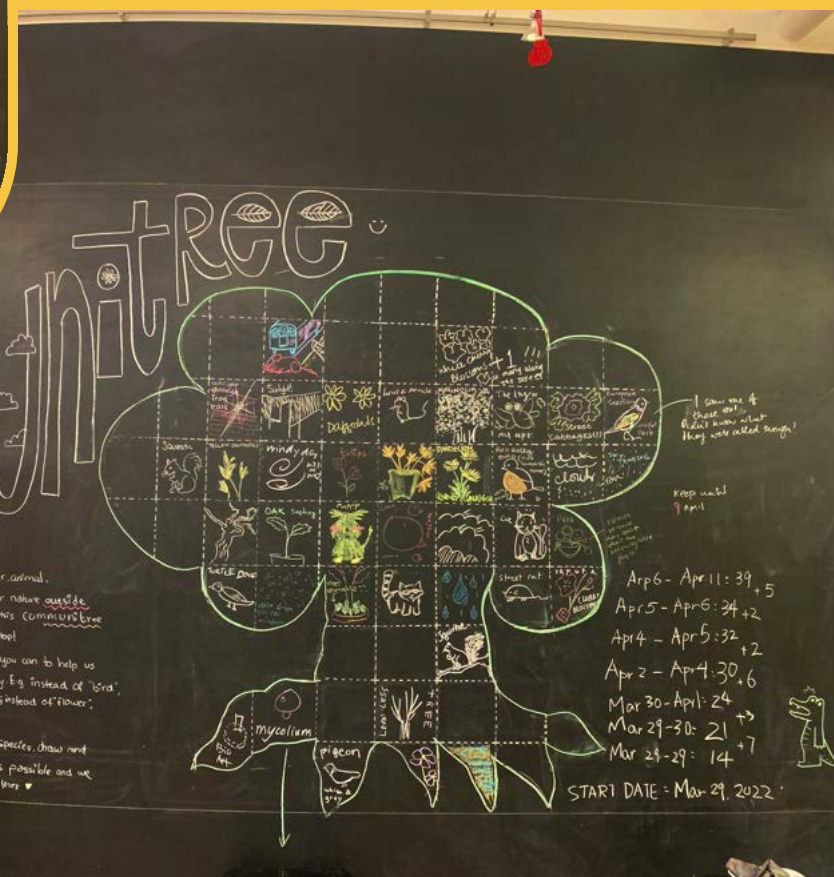
Communitree

In order to engage more people to develop the sense of connection with nature, my classmates and I created a game named "Communitree". This game aims to encourage the DSI community, including students, teachers, staff, and visitors, to appreciate and document the natural elements around us.

The game involves participants noticing these elements in their everyday surroundings, recording and "nurturing" them into a "tree" on a blackboard in our DSI studio, which we have named the "Communitree."



More than Around 40 natural elements were added to the Communitree within half of a month.

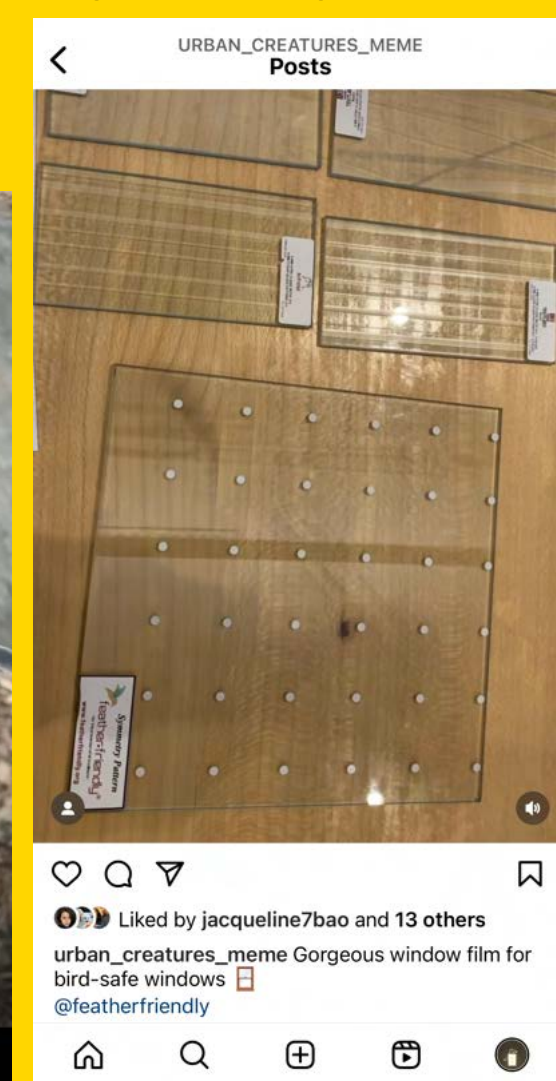
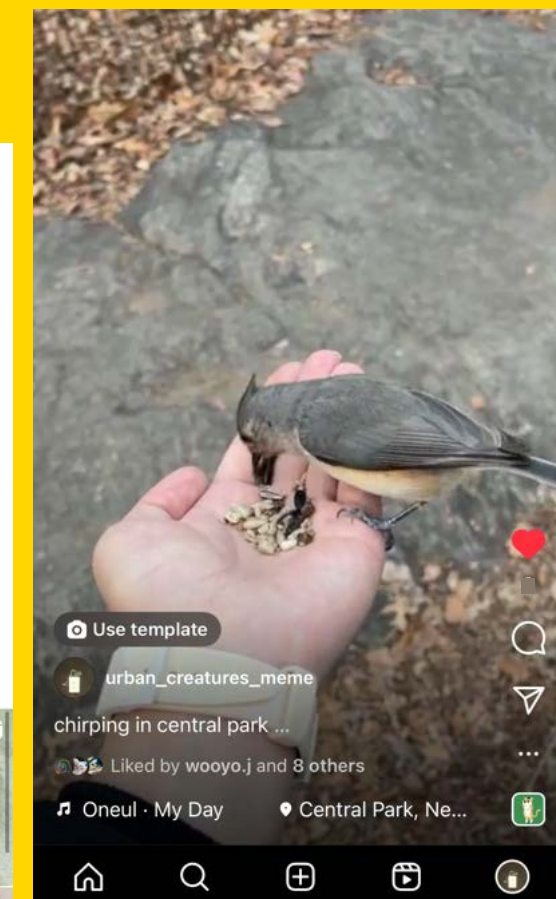


Communitree Game designed by Grayson Wise, Krutika Galgalikar, Pallavi Rawla, Sophia Geanacopoulos, and Wooyo Jin.

Urban_creature_meme

I launched an Instagram account "urban_creature_meme" to gather and showcase not only various birds but also other urban wildlife. It also promotes the idea of bird conservation and intends to share information about wildlife conservation and raise awareness about the importance of preserving the natural habitat for these creatures.

Social media is an excellent platform to educate and engage with a diverse audience. It is one such attempt to leverage this medium to drive positive change. I strongly believe that every individual has a role to play in preserving urban wildlife, and by raising awareness and providing knowledge through my Instagram account, I hope to inspire people to take small steps towards a more sustainable future.



Chapter 2: I'm a bird

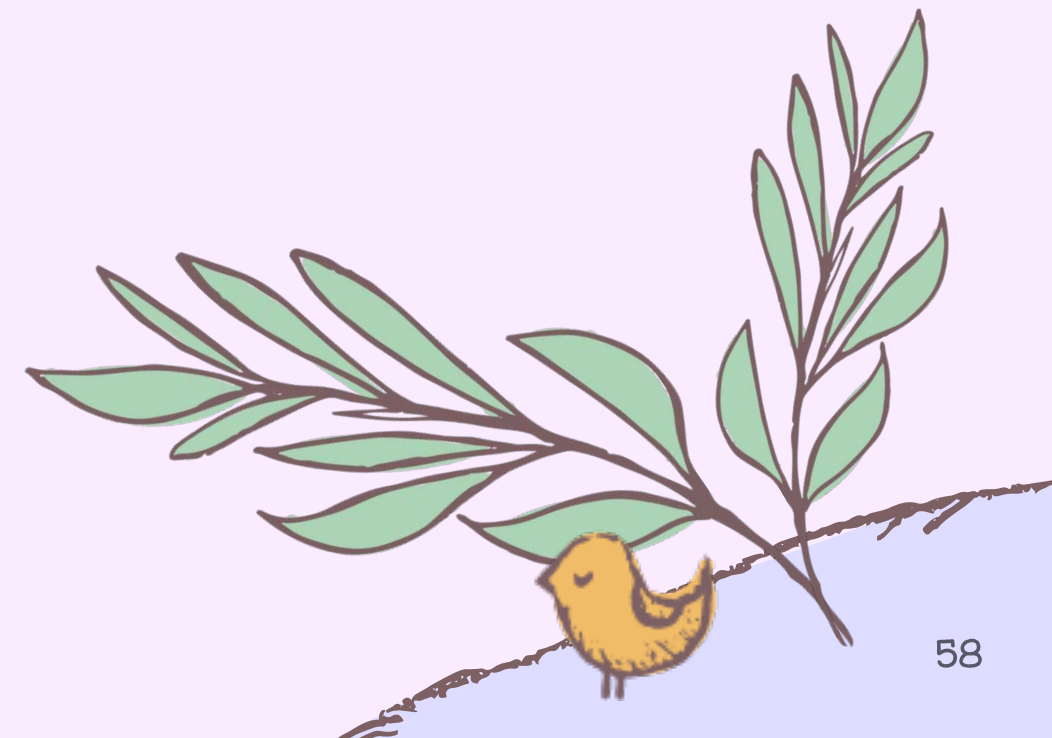
“

Lack of action,
Is not caused by lack of knowledge.

To act differently,
People need to see differently.

”

Reena Shukla



Bird helmet

I wish to let individuals develop an understanding of bird experiences and emotions. Let people think differently so as to act differently. For this, role-playing games can let people explore different perspectives and scenarios.

Novel way of engagement can develop a sense of empathy, leading to a shift in mindset and a change in behavior.

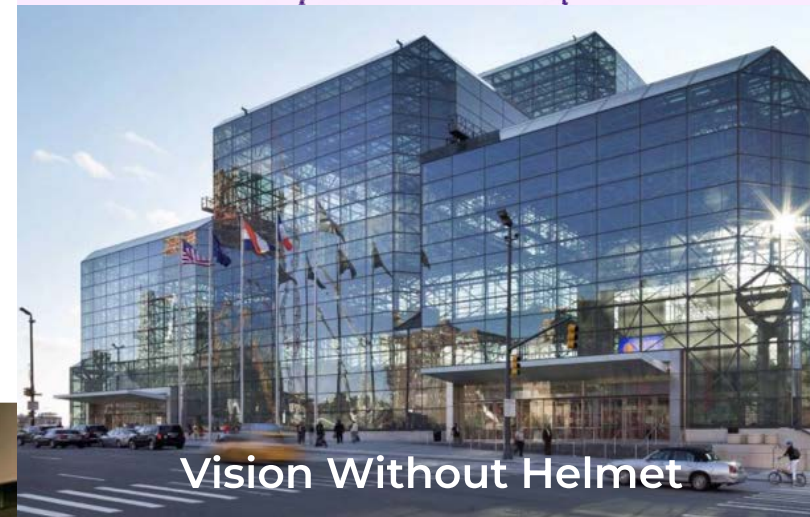


Role-playing lets people to explore different perspectives and scenarios of birds.

This project was experiencing a bird's vision in a bird helmet made of cardboards. Participants can only see through the side eye holes of this helmet. It mimics the side vision of birds.

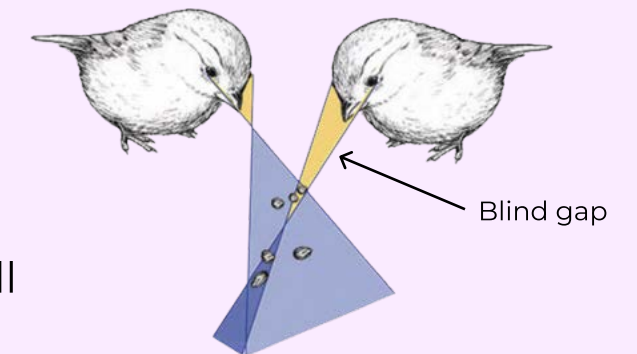


Bird helmets are made with the appearance of warbler and sparrow, who are the species encountering collision issues most.



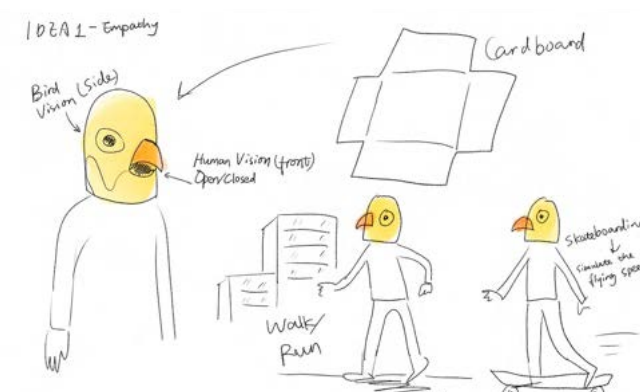
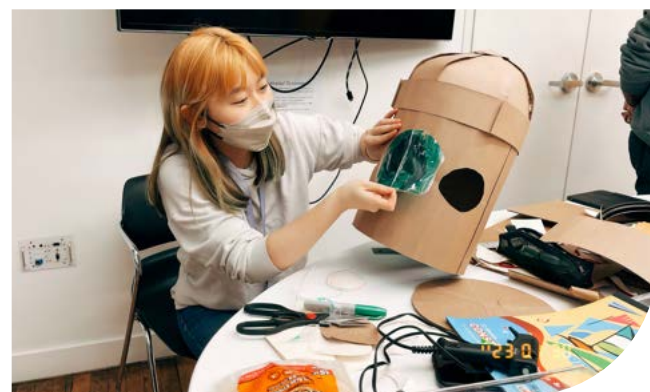
Vision Without Helmet

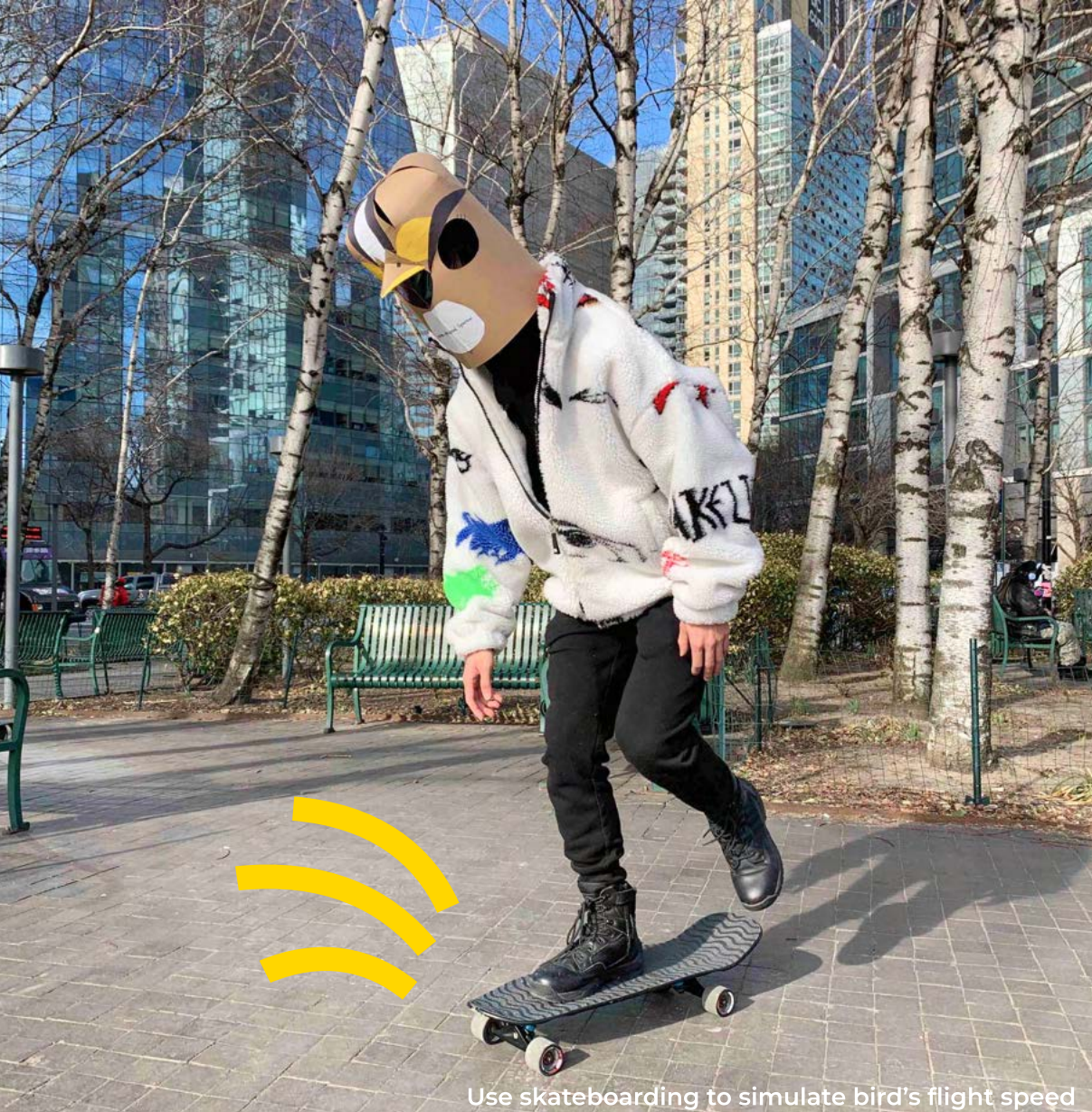
Vision With Helmet



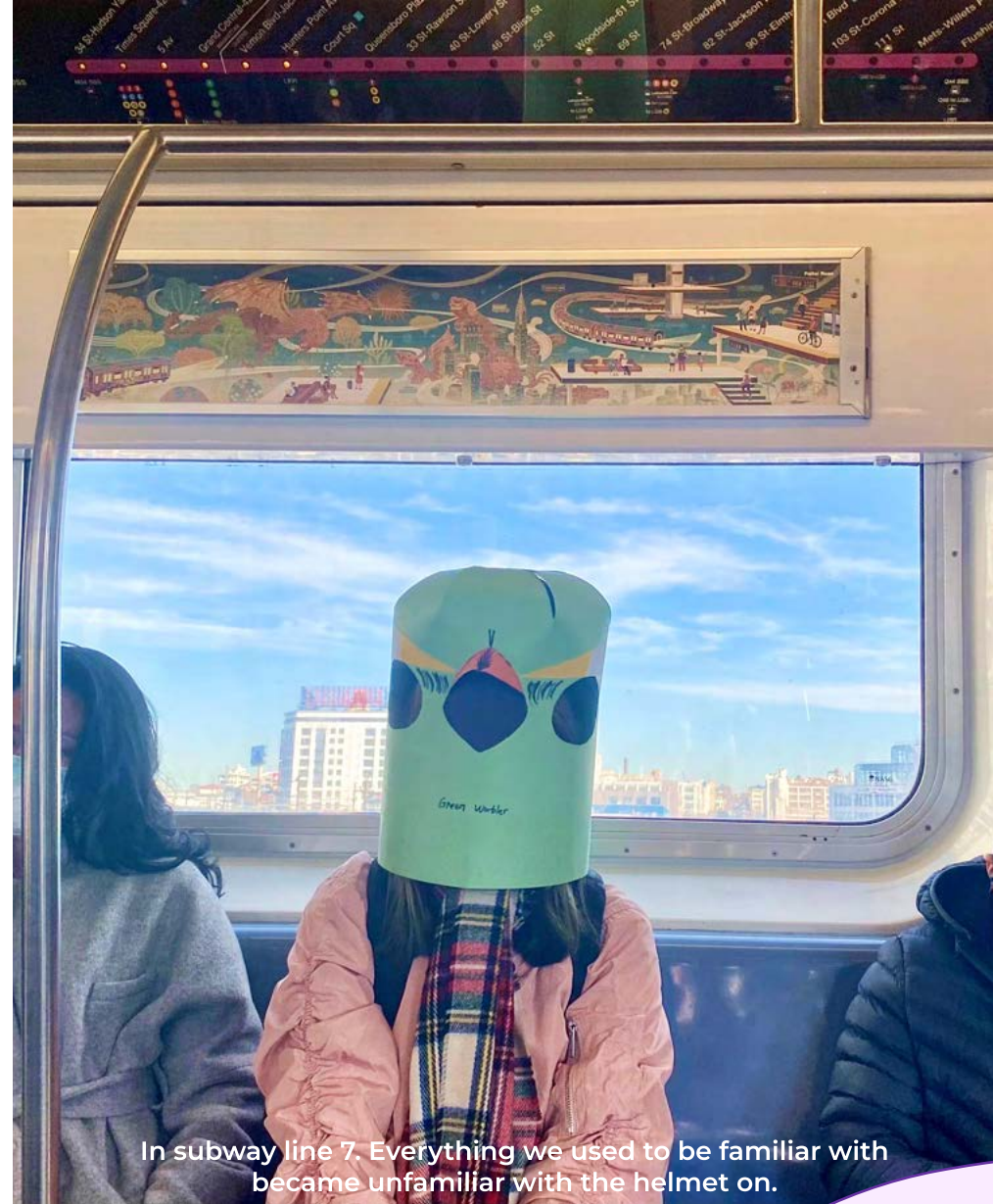
There is a blind gap between the tip of the bill and the binocular field.

After putting on the bird helmet, the vision to the front is unclear, and hard to focus, because the helmet simulates the blind gap of a bird's vision.





Use skateboarding to simulate bird's flight speed



In subway line 7. Everything we used to be familiar with became unfamiliar with the helmet on.



The participants include my friends, random people I met in some parks, and myself. We walked around the city with the helmet on.

We had to be very cautious to avoid crashing into anything. We needed to keep shaking our heads to use our peripheral vision to confirm what is in front of us repeatedly.

After conducting this project, my participants have gained a greater understanding of the challenges that urban birds face in their daily lives. They have developed a newfound appreciation for the resilience and adaptability of urban birds in the face of adversity.



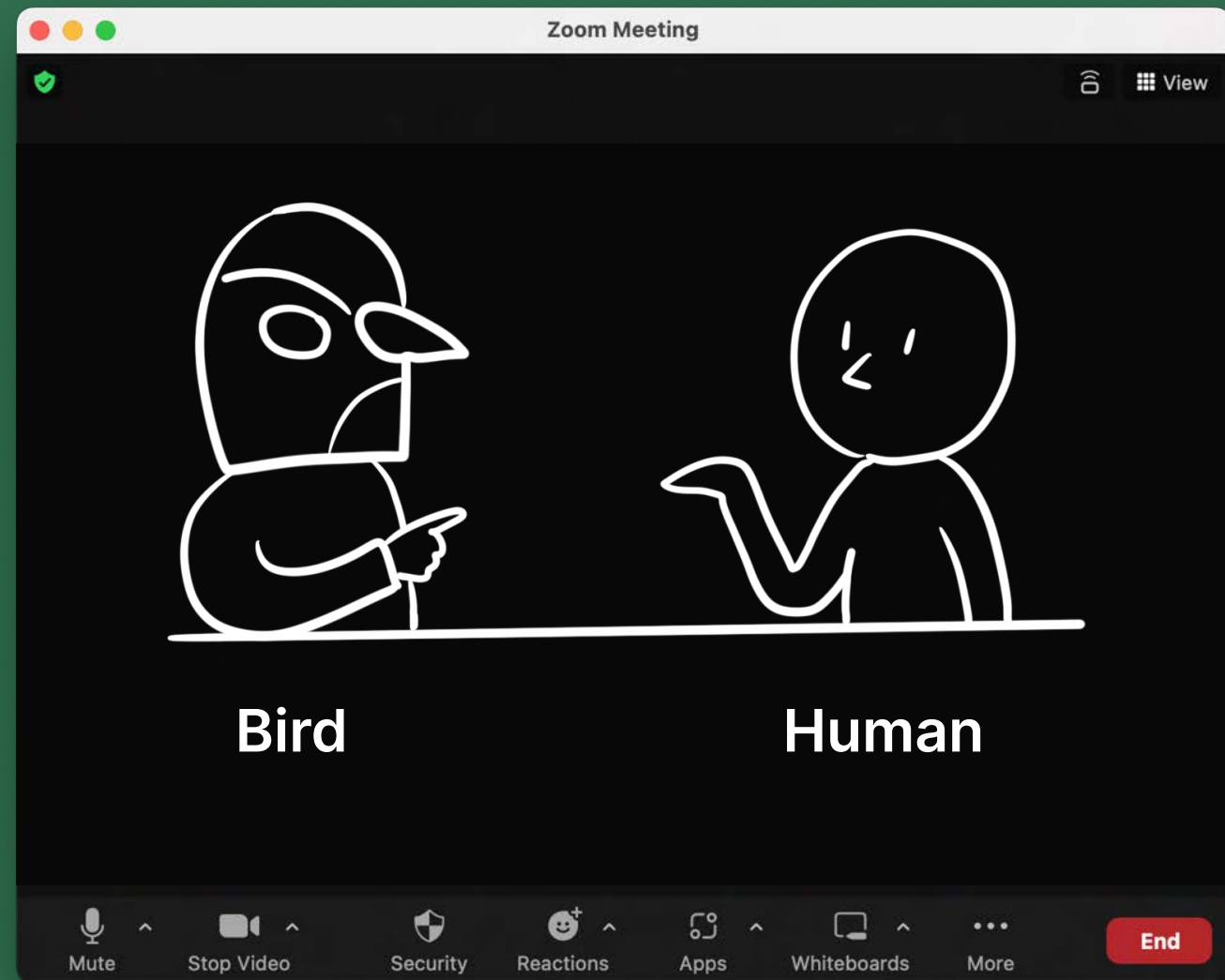
"I can't see my front clearly in this hat.

I have to turn around to check my side sight again and again.

Now I understand why I often see birds wagging their heads."



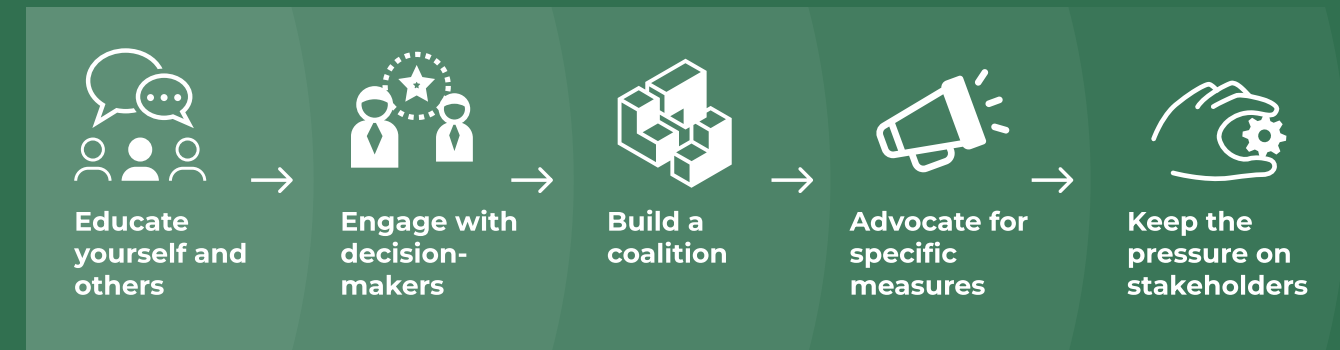
Chapter 3: we are human and birds



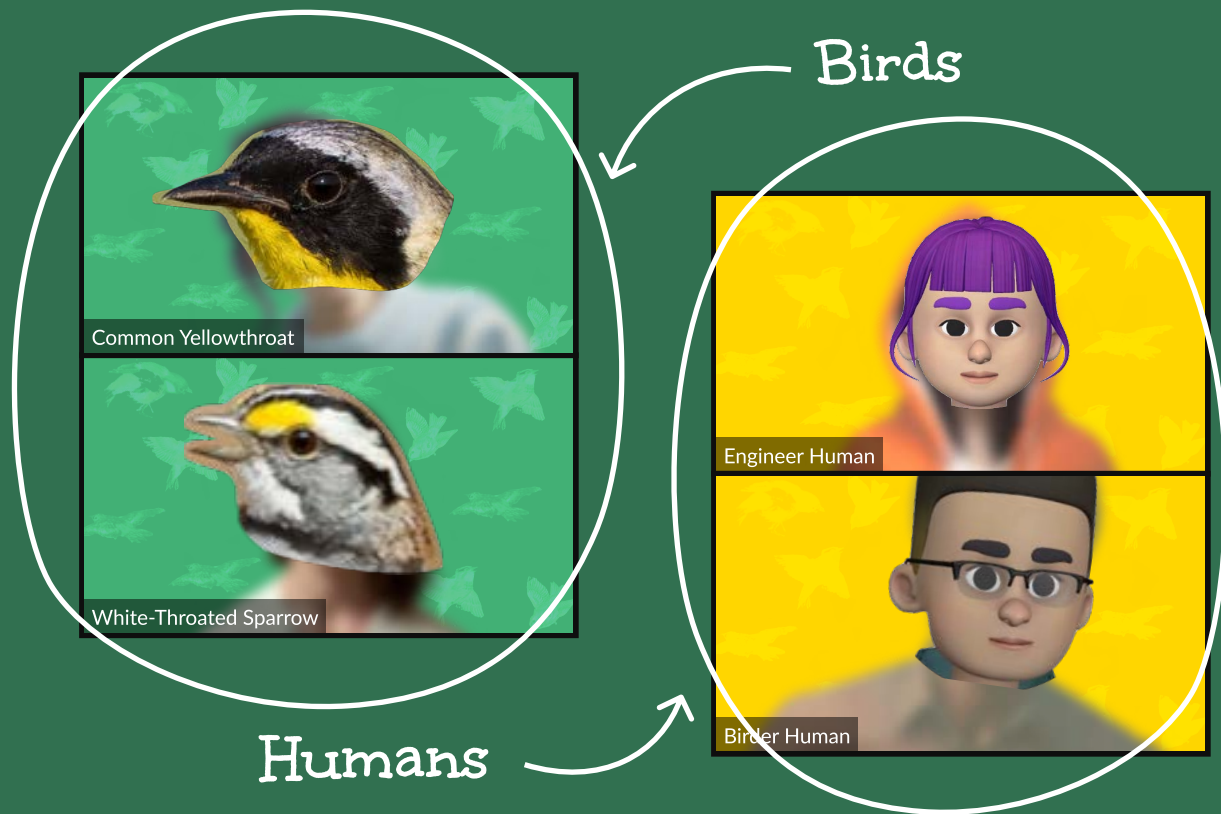
Human + bird meeting

This project involves human and bird role-play meetings to explore what is beneficial for birds. This activity has gone through three iterations, with the most recent version involving community partners such as NYC Audubon volunteers and the Gantry Plaza State Park neighborhood.

We generated ideas such as actionable steps that individuals can take to enhance the safety of their community for birds, as following:



Moreover, We penned a proposal letter template to residential buildings advocating them to adopt bird-friendly glass. Some of them have shared it on their apartment buildings' online platforms to reach all residents.



Half of participants role-played as birds and the others were human, to discuss topics about urban bird-friendly. The participants select their roles by randomly drawing from a set of role cards that contain specific traits of each role. Then they switched human and bird roles and do further discussion.



Participant: Yoki

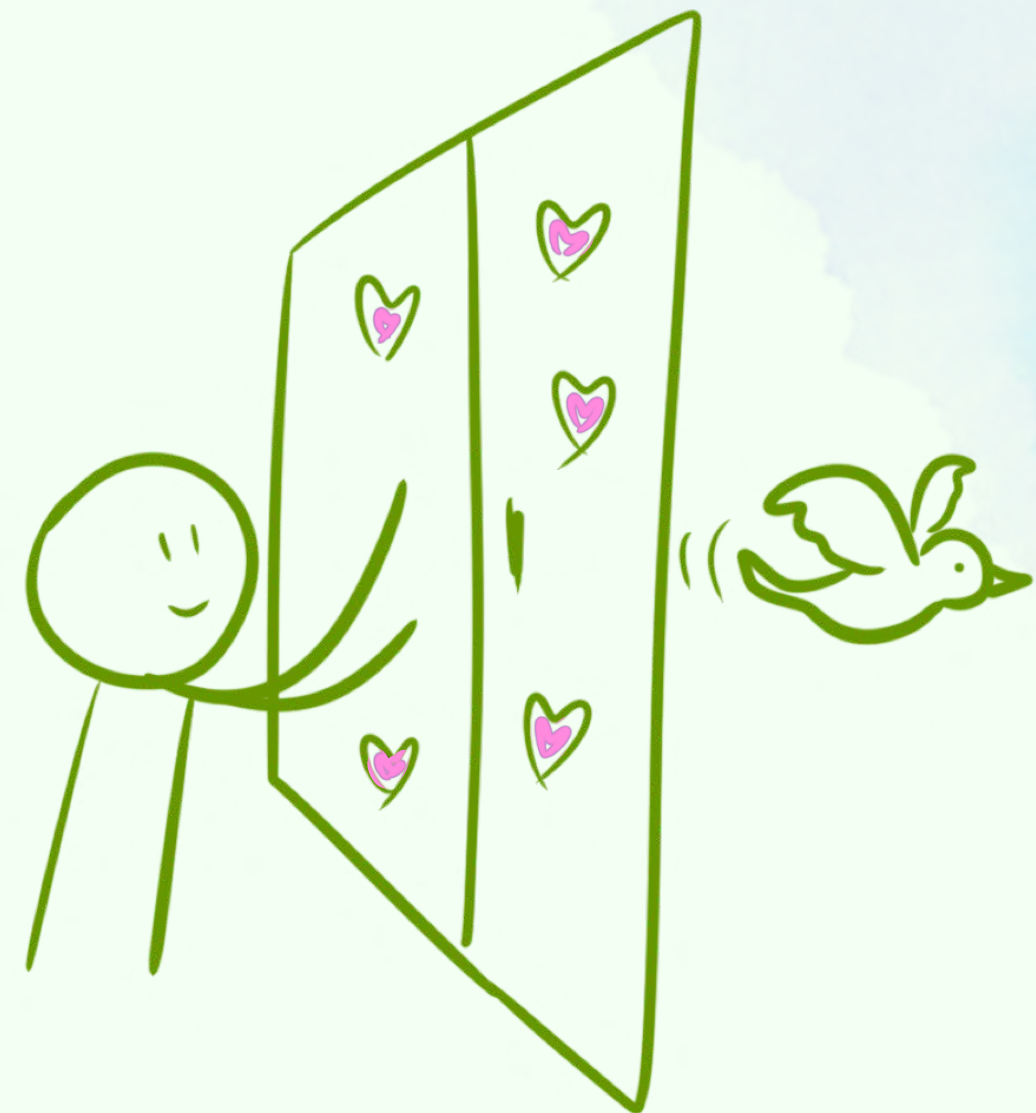
"I played bird first. And then even though I already switched to human, I still cannot help considering birds' benefits."

Insights

- 1 Novel stories and engaging activities have a strong appeal to participants**, making them easily attracted to these types of activities involved with bird conservation education.
- By embodying the struggles and experiences of birds like **bird role-playing, participants can develop a greater empathy and appreciation** for these creatures.
- Upon being aware of the difficulties that birds face in urban environments, **the majority of participants expressed compassion and want to know more**. This highlights the importance of raising awareness and educating the public about the challenges that wildlife face in cities. When people understand the issues at hand and how they can make a positive difference, they are more likely to take action to support the wellbeing of urban wildlife.
- When the content of an activity is personally relevant to participants, such as **when it relates to their daily lives, they are more likely to be engaged**. For example, if the activity focuses on the relationship between birds and the windows in their homes or how to observe and feed birds in their immediate surroundings, participants are likely to feel a stronger connection to the topic and be more eager to learn and participate.



Soar to the sky:
featherful interventions



Window sticker DIY toolkit

Make your window **bird-friendly**
by making your window “**bird-unwelcome**”

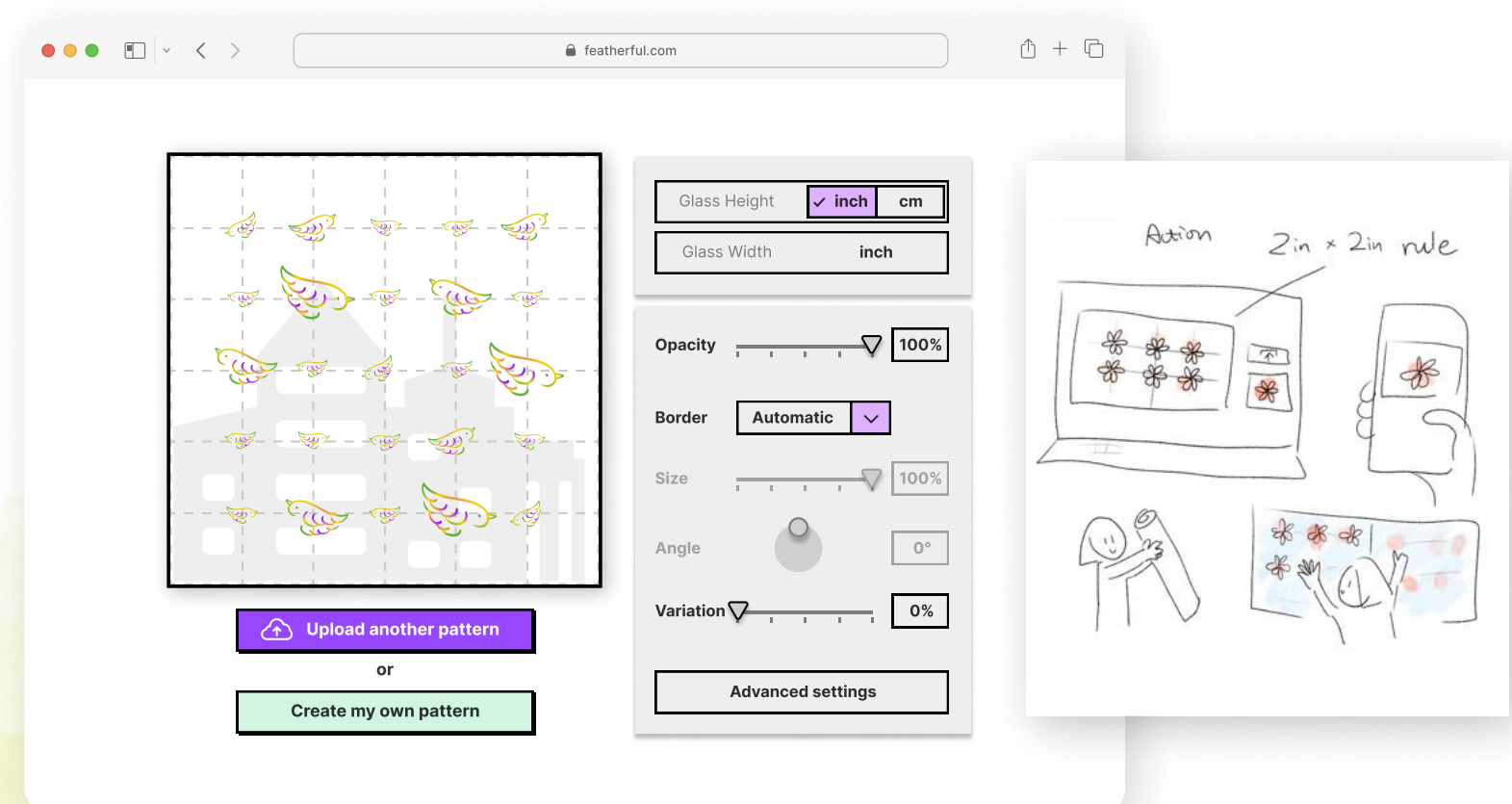
Window sticker DIY toolkit is a digital framework that can allow people to self-design the pattern of anti-bird-collision stickers for windows.



FEATHERFUL is a series of practices and proposals for developing people’s understanding and behaviors of building a bird-friendly urban environment.

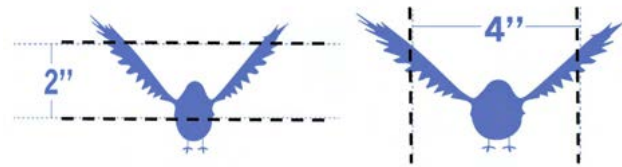
“ Featherful is something that is full of feathers.
Or a nickname for a hyper, happy, and flighty person. ”

Source: slangdefine.org



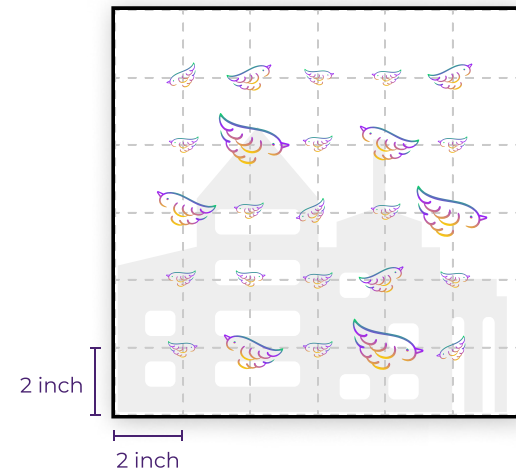
The inspiration is, using window decorations or films that adhere to scientific standards can be an effective way to prevent bird collisions. In addition, creating mural decorations on our windows is fun!

2X2 RULE



Uniformly cover the outside of your windows with a contrasting pattern of shapes spaced no farther apart than 2 inches vertically and 4 inches horizontally. To protect small birds 2"X2" spacing would be better.

Source: Menunkatuck Audubon Society



Auto arrange sticker patterns by 2x2 rule

This framework will automatically arrange user-designed patterns according to the 2by2 rule, a spacing standard that has been proven effective in preventing bird collisions. The 2by2 rule recommends a spacing of 2 inches between pattern elements in both vertical and horizontal directions.

- 1 Create/upload Pattern(s)
- 2 Auto Generate 2*2 Sticker Set
- 3 Customize Patterns
- 4 Export Sticker Set
- 5 Print Sticker Set
- 6 Apply Sticker Set on Window

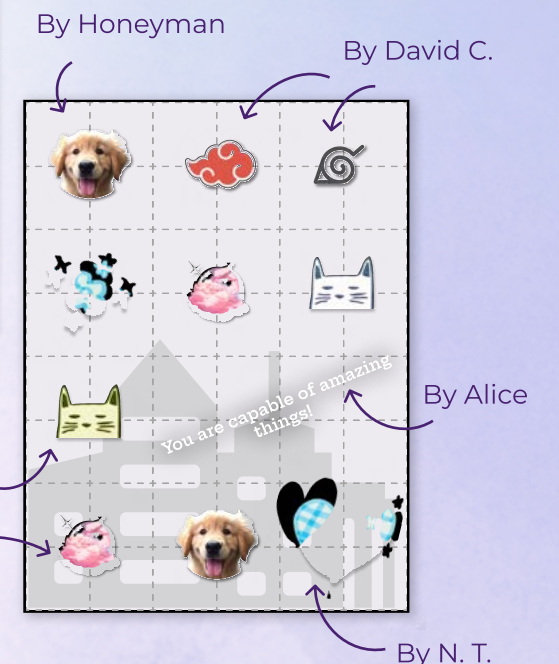
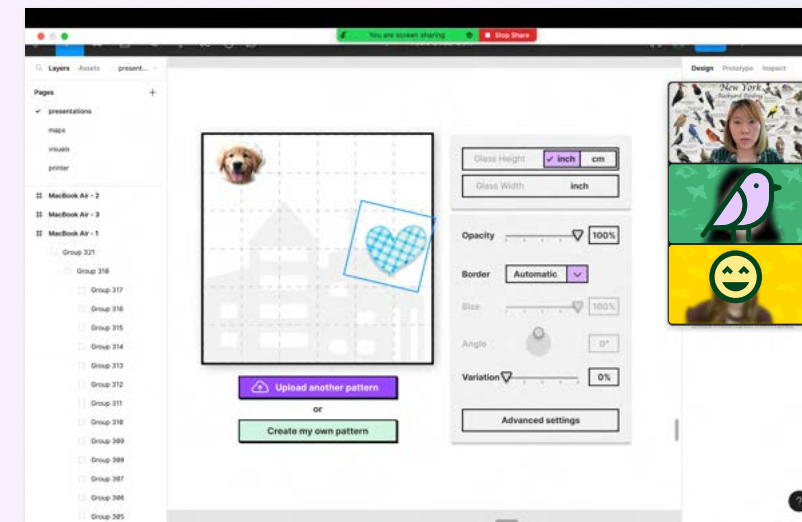
Users can either upload images or create patterns online using this tool. They can also customize the number, size, position, and color of the patterns. Once the unique window decal is created, it can be printed out.

To minimize the environmental impact and prevent overconsumption of sticker production, I have collaborated with a local printer store and explored suitable materials. We have selected Viziprint Impress, a removable, reusable, and waterproof material that will ensure the longevity of the stickers.



Viziprint Impress

Collaborative sticker making process



During the Human + bird meeting, participants worked together to co-design and co-test this framework. They created a lot of amazing patterns during the tests.

Meet art & design fair

I am thrilled to have had the opportunity to spread awareness about protecting urban birds at **AAAAH!**'s art & design fair. **AAAAH!** is a New York-based organization that empowers Asian communities globally and showcases the rich and diverse Asian culture.

On April 21 and 22, 2023, just before and on **Earth Day**, I used graffiti to promote the concept of bird-friendly design on the glass windows and doors of their event space in Manhattan, New York. It also attracted others to join me in painting the graffiti. Together, we painted the glasses with eye-catching designs, encouraging more people to take action for the benefit of our feathered friends.



Meet Miao embroidery

FEATHERFUL collaborated with **Pastforward** to design a set of window stickers used for anti-collision window stickers featuring Miao embroidery patterns. **Pastforward** is a programme aimed at preserving China's traditional ethnic cultural heritage of Miao embroidery, which is a unique form of art created by the Miao people, one of the largest ethnic groups in China. This collaboration not only helps protect birds, but also showcases the charm of Miao embroidery during AAPI heritage month.



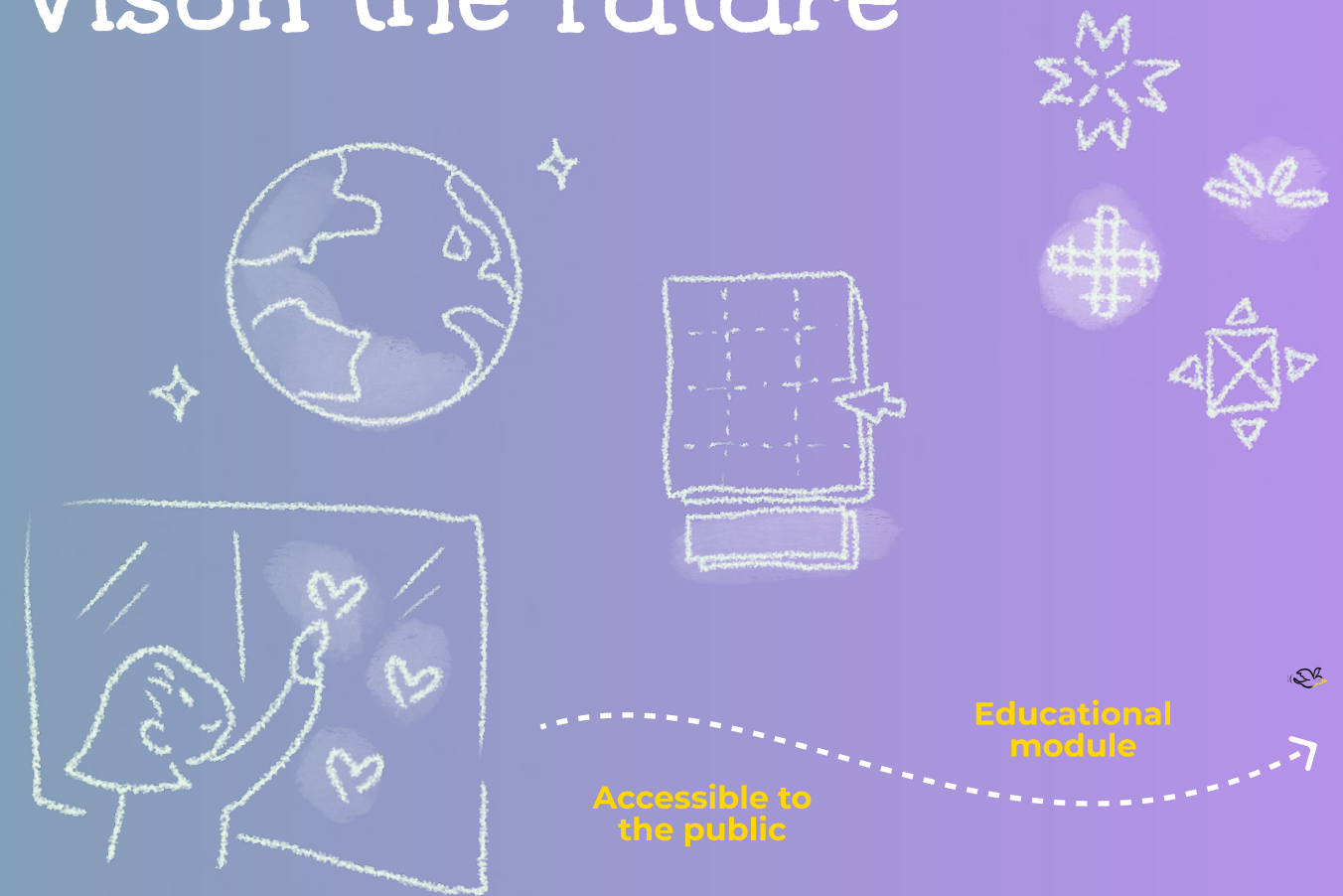
Learnings and gainings

FEATHERFUL project has been an incredibly rewarding journey for me! Not only was I able to contribute to creating positive change in bird protection, but I also felt so proud knowing that more and more people were learning about the idea of urban bird-friendly environments from me and taking action!

Undertaking this project was truly an eye-opening experience. I got to explore the different types and models of social innovation, and learned about the drivers and barriers of social innovation. One of the most exciting things I discovered is that **social innovation does not necessarily have to be a practical solution - it can also take on various other forms, from abstract to specific.**

When I felt lost, it might be helpful to set aside some doubts and worries and just **get my hands dirty**. Sometimes, I might get too caught up in my own thoughts and overlook practical opportunities and experiences that could bring me new inspiration and ideas. By taking action, I could also develop resilience and perseverance, which are essential qualities for achieving my goals and pursuing my dreams.

Vision the future



To further develop FEATHERFUL, a website will be released, hosting the digital framework of the window sticker DIY toolkit and make it accessible to the public. Additionally, I hope to turn the project into an educational module for younger generations by providing a fun and impactful toolkit for schools. This module would allow students to create bird helmets and stickers, and would help to engage them in the cause of creating bird-friendly urban environments.

Overall, I hope for a better world where people, birds, and all other living beings can hum with each other, and where nature can thrive.

Chirp my special thanks

To all the Design for Social Innovation advisors and guides

Kara Meyer, Lona Vincent, Mari Nakano, Miya Osaki, Sahar Ghaheri

To my 2021, 2022, and 2023 DSI cohorts

We learned and grew together, you are such great friends and teachers

To my community partners

NYC Audubon, Gantry Plaza State Park neighborhood



To my beloved

My parents, my partner, and my dog



To my supportive friends

David S., Diana Guo, PHD Bro, Roxy Jin, Yoki Zhang

To nature

We thrive together

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