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Monarch Butterflies Found in Curbside Rain Gardens in Queens and Brooklyn

Population of Monarch Butterflies Has Significantly Declined Over Last Two Decades

Rain Gardens Capture and Naturally Absorb Stormwater, Ease Pressure on the City's Sewer System and Thereby Improve Health of Local Waterways

Rain Gardens also Improve Air Quality, Lower Summertime Temperatures and Create Natural Habitats in Ultra-Urban City Environment

Photos and Videos are Available on DEP's Flickr Page

The New York City Department of Environmental Protection (DEP) today announced that monarch butterflies have been found by gardeners in curbside rain gardens built over the last few years in Queens and Brooklyn. Since the mid-1990's, the population of monarch butterflies has dropped significantly due to many factors, including severe weather events and a changing climate, the use of pesticides, invasive species and a rapidly shrinking habitat. The curbside rain gardens include hardy plants to help soak up stormwater before it can enter the sewer system and contribute to overflows into local waterways. Milkweed, a favorite of the monarch butterfly, is one of the plants that is regularly included in the rain gardens. With roughly 2,500 rain gardens built over the last few years, and thousands more planned for the coming years, monarch butterflies will have an expanding habitat throughout the five boroughs to both reproduce and feed during their annual migration. A map of rain gardens and other green infrastructure installations is available here.

"Curbside rain gardens are primarily constructed to help capture stormwater, which is vital to our strategy to continue to improve the health of New York City's surrounding water bodies," said **DEP Acting Commissioner Vincent Sapienza**. "However, this exciting finding is also a perfect illustration of how they can serve

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many other important purposes, including improving air quality and creating beautiful natural habitats throughout the city."

"Green infrastructure is a critical element of the City's climate resiliency program," said **Daniel Zarrilli, NYC's Senior Director for Climate Policy and Programs and Chief Resilience Officer**. "In addition to improving the health of our city's waterways and helping to reduce temperatures, this news demonstrates that our efforts to expand green infrastructure throughout the city are creating resilience and biodiversity dividends for an important species threatened by the impacts of climate change."

"The magic of the monarch butterfly is that little patches of habitat matter. People everywhere can help by protecting and restoring spaces for the butterflies in their communities. Efforts at the local level really make a difference in conserving this species nationally," said **Wendi Weber, northeast regional director for the U.S. Fish and Wildlife Service**.

"The Nature Conservancy applauds the NYC Department of Environmental Protection for its comprehensive commitment to green infrastructure in NYC, which includes planting native host plants for monarchs, an important pollinator whose population is at risk," said **Emily Nobel Maxwell, The Nature Conservancy's New York City Program Director**. "The discovery of monarch buttery chrysalises yet again proves that green infrastructure is a great investment that provides multiple benefits, including improving water quality, enhancing our neighborhoods, and helping both people and nature thrive."

"This is a great example of the intricate connection between the green and blue systems of our urban ecology," said **Jaime Stein, Chair, S.W.I.M. Coalition Steering Committee, and Professor at Pratt Institute**. "The butterflies are evidence of multiple benefits achieved through green infrastructure. The rain garden, a design intervention to enhance water quality, through its greenery provides habitat as well many other benefits to all city dwellers."

"The stormwater protection and natural beauty DEP's curbside rain gardens bring to the streetscape already makes them precious—but the arrival of the butterflies illustrates that they provide so much more," said **NYC Parks Commissioner Mitchell J. Silver**. "By offering a home for a resurgent monarch butterfly population, the gardens are helping to bring greater health to New York City's ecosystem one chrysalis at a time."

"The return of declining species demonstrates that properly designed and built infrastructure can bring us a more resilient and sustainable City," said **DDC Commissioner Feniosky Peña-Mora**. "DDC is excited to continue working with DEP and NYC Parks to further contribute to the wellness of New York City's complex ecosystem."

"The construction of curbside rain gardens has greatly improved the resiliency of infrastructure that supports businesses and communities in Queens and Brooklyn," said **NYCEDC President Maria Torres-Springer**. "We are elated to see this project continue to have such a catalytic impact on the surrounding environment."

"The chrysalises of monarch butterflies in our curbside rain gardens are poetically emblematic of the ongoing transformation of Brooklyn, from oft-ignored urban decay to glorious and soaring rebirth," said **Brooklyn Borough President Eric Adams**. "Going green proves time and again to be the right decision on multiple fronts, from cost efficiency and environmental health to streetscape aesthetics and overall quality of life."

Council Member Costa Constantinides, Chair of the Council's Environmental Protection Committee, said, "Making our city more sustainable also benefits our ecology. Curbside rain gardens have improved our environmental health, reduced sewage overflow, and protected our waterways. At the same time, these gardens have encouraged the growth of the monarch butterfly species, which has been declining in population. These types of effects show how all our systems are inter-related and how many added benefits our

green infrastructure can bring. I am excited to learn about this finding and commend DEP for their hard work on this."

"Investing in urban resiliency improves the environment for everyone, butterflies included," said **Council Member Stephen Levin**. "Smart stormwater management reduces the strain on our sewer system and prevents untreated overflow from adversely impacting our local waterways. I applaud DEP's commitment to bolstering our green infrastructure and hope our biodiversity continues to show tangible signs of improvement."

"In a city that faces a growing population, and in a world where the threat of climate change is ever mounting, we must institute creative environmental strategies to secure a stable and efficient city. The success of curbside rain gardens in beautifying streets, capturing stormwater, and now with the added benefit of cultivating the resurgence of the monarch butterfly, indicates a job well done by DEP," said **Council Member Rafael L. Espinal Jr**.

"As I drive through the communities of Wakefield, Edenwald and Eastchester, sometimes I can't help but stop and admire the beautiful curbside rain gardens filled with plants growing tall and strong. Now, to add the monarch butterflies to the equation only enhances the scenery even more. This project has done much to bring natural beauty to the Northeast Bronx," said **Council Member Andy King**, whose district recently saw the completion of 122 new curbside rain gardens.

"Brooklyn Botanic Garden has been growing and promoting the use of a robust collection of milkweeds to support monarchs and other pollinators for many years," says **Melanie Sifton, Vice President of Horticulture at Brooklyn Botanic Garden**. "Having a network of these habitats throughout the city, however, is vital, and we are heartened that the DEP's curbside rain gardens are attracting monarchs in Queens and Brooklyn. 'If you plant it, they will come,' as they say, and the rain gardens provide the right habitat and resources for monarchs to return and thrive in the city."

"These findings highlight the importance of reintroducing native species within our city and the efficacy that a multitude of small gardens can have on boosting the city's biodiversity," said **Queens Botanical Garden's Head of Interpretation Gennadyi Gurman**.

"This exciting discovery is great news for monarch butterflies, and we commend DEP for their efforts to provide critical habitat for declining populations," said **Craig Gibbs, an entomologist and Assistant Curator at the Wildlife Conservation Society's Queens Zoo**. "It also shows that nature is tenacious and given a chance, can flourish even in the most urban areas."

"This is a great example of how well-planned green infrastructure can be a multifaceted investment in building a more sustainable city and world," said **Andrea Parker, Executive Director of the Gowanus Canal Conservancy**. "DEP's curbside rain gardens not only help keep combined sewage overflow out of our waterbodies—their thoughtful design includes numerous hardy native plants that provide much-needed habitat for our native insects."

"The great thing about Green Infrastructure is the ability to create multiple environmental benefits through simple and natural means" said **Newtown Creek Alliance Program Manager Willis Elkins**. "Capturing larger amounts of stormwater runoff is desperately needed to reduce combined sewer overflow and improve the health of local waterbodies, but being able to also create habitat for insects, improve air quality and reduce heat island effect at the same time is an approach we can only encourage more of."

"Another reason to love rain gardens! They are not only good for reducing pollution into New York City's waterways; they can enrich our environment, from supporting native pollinators like monarch butterflies to cooling our neighborhoods against the effects of the urban heat island. What a good sign of the benefits of green infrastructure," said **Executive Director of the Bronx River Alliance and NYC Parks Bronx River Administrator Linda R. Cox**.

In the New York region, monarch butterflies lay their eggs on three types of milkweed, Common Milkweed (*Asclepias syriaca*), Butterfly Weed (*Asclepias tuberosa*) and Swamp Milkweed (*Asclepias incarnate*), as it is the only food a young caterpillar will eat before it transforms into a chrysalis. The milkweed contains a toxin that once ingested, makes the monarch caterpillars and butterflies distasteful to predators. The purple-flowering milkweed is often planted within the rain gardens because its root system is capable of absorbing large amounts of water. Other insect species that have been found within the rain gardens include ladybugs, praying mantis and honey bees, which are valuable pollinators.

DEP gardeners found monarch butterfly caterpillars and chrysalises within rain gardens in Rego Park, near Queens Boulevard, and in Brownsville, near Atlantic Avenue. The jade and gold chrysalises were closely monitored until the monarch butterflies emerged. This latest generation of monarchs will fly south to Mexico for the winter where it will begin the species' lifecycle all over again.

Rain gardens are built in City sidewalks and they resemble standard street tree pits, except that they vary in size, have curb cuts that allow stormwater to enter and overflow if it becomes saturated, and have been designed in a way that will allow them to manage up to 2,500 gallons each during a storm. DEP has developed standard designs, specifications and procedures for building green infrastructure in the streets and sidewalks of New York City. In partnership with the Departments of Transportation and Parks and Recreation, DEP conducts an extensive site selection process that includes geotechnical investigations and surveys.

During construction, the rain gardens are excavated to a depth of five feet and are then backfilled with layers of stone and engineered soil. The stone layers contain void spaces that store the stormwater and the engineered soil promotes infiltration. The addition of hardy plants further encourages infiltration through root growth and increases the capacity of the rain garden through evapotranspiration. The rain gardens are designed so that all the stormwater is absorbed in less than 48 hours and dedicated maintenance crews ensure that they are functioning properly, including removing any trash that may have accumulated and pruning the trees and plants. The crews visit each rain garden approximately once a week and additional staff will continue to be added as the program expands.

New York City, like other older urban communities, is largely serviced by a combined sewer system where stormwater that falls on roofs, streets, and sidewalks, and wastewater from homes and businesses are carried through a single sewer line to treatment plants. The city's 14 treatment plants can manage and treat to federal Clean Water Act standards all the wastewater created in New York City on a dry weather day, or about 1.3 billion gallons on average. On a rainy day they have the capacity to clean more than twice the dry weather flows. However, during intense precipitation events, the stormwater that falls on the city's impervious surfaces exceeds that capacity and overflows can be discharged into local waterways. If the overflows were not discharged, the City's treatment plants would be flooded and severely damaged and wastewater could backup into homes and businesses.

Over the last decade the City has invested more than $10 billion in upgrades to wastewater treatment plants and related efforts to reduce combined sewer overflows and testing confirms that the water in New York Harbor is cleaner today than it has been in more than a century. However, overflows remain the city's primary harbor water quality challenge. As traditional "grey" infrastructure upgrades became increasingly expensive, the NYC Green Infrastructure Plan was launched. An alternative approach to improving harbor water quality, it combines traditional infrastructure upgrades and the integration of green infrastructure to capture and retain stormwater runoff before it can ever enter the sewer system and contribute to overflows. New York City and New York State have entered into a Modified Consent Order which formalized the City's inclusion

of green infrastructure as an important component of its plan to reduce combined sewer overflows into local waterways and improve the ecological health and cleanliness of New York City harbor water.

DEP manages New York City's water supply, providing more than one billion gallons of water each day to more than nine million residents, including eight million in New York City. The water is delivered from a watershed that extends more than 125 miles from the city, comprising 19 reservoirs and three controlled lakes. Approximately 7,000 miles of water mains, tunnels and aqueducts bring water to homes and businesses throughout the five boroughs, and 7,500 miles of sewer lines and 96 pump stations take wastewater to 14 in-city treatment plants. In addition, DEP has a robust capital program, with a planned $14 billion in investments over the next 10 years that will create up to 3,000 construction-related jobs per year. This capital program is responsible for critical projects like City Water Tunnel No. 3; the Staten Island Bluebelt program, an ecologically sound and cost-effective stormwater management system; the city's Watershed Protection Program, which protects sensitive lands upstate near the city's reservoirs in order to maintain their high water quality; and the installation of more than 820,000 Automated Meter Reading devices, which will allow customers to track their daily water use, more easily manage their accounts and be alerted to potential leaks on their properties. For more information, visit nyc.gov/dep, like us on Facebook, or follow us on Twitter.

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