

fresh perspectives



FreshkillsPark Newsletter — Summer/Fall 2012



Birds flock to Freshkills Park's unique ecological offerings

When the Fresh Kills Landfill was still active, the site was iconically known for attracting tens of thousands of gulls. Since the landfill's closure, the site has once again become a nexus of avian activity, this time as a tranquil, ecological oasis for many different species of birds.

Even as habitat restoration plans continue to transform Freshkills Park into a growing ecological asset, the site's present features provide rich benefits for birdlife. The sweeping scale and unique siting of Freshkills Park, coupled with its existing and planned range of habitats and ecological communities, provide great value for a number of long-distance Neotropical migrants and resident bird species of the Tri-State Area. As a large open space buffered by mature woodlands, freshwater wetlands and a major estuary, the park is currently home to over 100 identified species throughout the year. As the park's development over the next 30 years continues to enhance connectivity to the neighboring Staten Island Greenbelt, the William T. Davis Wildlife Refuge and the Arden Heights Woods, even more species can be expected to nest, breed, and roost throughout the park's 2,200 acres.

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Above: (Left) Gulls swarm over the open Fresh Kills Landfill. Archival photo courtesy of DSNY; **(Right)** Visitors with binoculars scan the landscape at a bi-monthly birdwatching tour of Freshkills Park.

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Freshkills Park serves as an important stopover for bird life

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A MIGRATORY STOPOVER

Freshkills Park is a stopover along the Atlantic Migratory Flyway, providing birds with safe opportunities for resting and refueling between taxing long-distance flights. The Atlantic Flyway extends in a wide band across the East Coast from Florida to Nova Scotia, and Freshkills Park is primed to take advantage of its geographical context to serve as an appealing avian destination.

During their spring and fall migrations, birds make use of foraging resources at stopovers to replenish body mass and energy reserves, often stopping for one to three days before continuing onward. Birds also function as important pollinators and maintain the insect and rodent populations during their journeys. Due to the time and energy constraints during migration, which can last up to three or four months, landbirds make use of a variety of available forested and vegetative cover types along the way. In urbanized regions, this flexibility renders vital even smaller green spaces such as graveyards and recreation areas, and particularly more robust habitats like Freshkills Park.

Ornithologists classify migratory stopovers and bird habitats in a number of ways, and the best way to understand how Freshkills Park functions is to consider it a “convenience store.” This refers to habitable land that is structurally heterogeneous – physically and ecologically diverse – with internal and nearby sources of fresh water and a multiplicity of accessible food resources. The park's wooded and reed-filled edges alongside open grasslands provide great protection from surprise predator attacks after exhausting nights of migration. Other large urban parks such as Central Park also fit this important classification. Because available greenspace is the primary limiting factor for birds in migration, the status of Freshkills Park as a sizable stopover allows the site to serve a wide variety of birdlife well before habitat restoration

plans for the park are complete.

A HAVEN FOR GULLS

Based on archival photos, the former landfill was a popular destination for certain types of birds when it was active. Fresh Kills Landfill was once teeming with Herring Gulls (*Larus argentatus*) and Great Black-backed Gulls (*Larus marinus*) – a record 30,000 in a 1998 census taken as part of the Audubon Society's “Christmas Bird Count” – as well as starlings, pigeons, and crows. Swarms of these few species were a marker of a highly predictable food source within an otherwise poor-quality habitat. The biggest attractor of this activity was something rare among most ecological communities: birds could rely on a food source of rats, voles, and black flies that would feed on the continual influx of exposed organic garbage. This in fact created a highly attractive, though species-poor, ecological environment for these flocks. Today, the actual numbers within these specific species are lower than when the landfill was open, but there has been a dramatic increase in the overall diversity and safety of species as habitat and food sources have expanded.

HABITAT OPTIONS

The mosaic of habitat types now found at Freshkills Park offers a benefit to several distinct orders of birds. Many songbirds including Indigo Bunting (*Passerina cyanea*) and Savannah Sparrow (*Passerculus sandwichensis*) take advantage of the foraging opportunities in the upland grassland and successional woodland. Songbirds comprise the majority of Neotropical migratory birds observed at the park. Raptors such as the Red-tailed Hawk (*Buteo jamaicensis*) and Northern Harrier (*Circus cyaneus*) are frequently spotted foraging and nesting in the open fields and meadows. Waterbirds like the Pied-billed Grebe (*Podilymbus podiceps*) and Hooded Merganser (*Lophodytes*

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Mission

As Freshkills Park moves from the planning stages to implementation, we strive to keep community members informed of the progress in bringing this innovative project to reality. Building this park requires many coordinated activities, including the planning and design of the park, engineering for roads and other technical aspects of the park design, environmental assessment and regulatory permitting. The purpose of the Fresh Perspectives newsletter is to provide updates about the project's progress as well as information about the site's history and some of its unique features, resources and complexities.

Right: Geese spotted on a recent birding tour.
Below: (right) Diagram of bird types commonly found in the existing habitats within Freshkills Park.

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cucullatus), as well as a range of other wading birds, shorebirds, and gulls are frequent winter residents in the tidal waters and freshwater wetlands throughout the site.

An even greater array of migratory and resident birdlife can be expected at the park as substantial new habitat is created. Based on surveys of nearby habitats, a total of 215 bird species may one day make their home at the park. A larger palette of native plant communities will be cultivated in restored wetlands, grasslands and expanded woodlands as a key aspect of the park plan; and will be connected to surrounding Staten Island habitats, drawing in the many species occurring on these adjacent parcels.

UNIQUE GEOGRAPHY

From the local to regional scale, Freshkills Park provides a distinctive setting for birdlife. Many marsh islands, such as Prall's Island in the abutting Arthur Kill, have historically been home to the largest nesting colonies of wading birds within the New York/ New Jersey Harbor Estuary. A variety of significant protective buffer zones for breeding songbirds and foraging wading birds have also been identified nearby, creating important linkages in the area. Mature woodlands surround the park, including Willowbrook Park, LaTourette Park, and Arden Heights Woods. Abundant birdlife is known to occur in these wooded areas, including the Eastern Screech Owl (*Otus asio*), Blue-winged Warblers (*Vermivora cyanoptera*), Bank Swallow (*Riparia riparia*), and Hermit Thrush (*Catharus guttatus*). Over 117 bird species have been recorded at the William T. Davis Wildlife Refuge, on the northern edge of the site. This local diversity presents exciting opportunities for the occurrence of these species within Freshkills Park. Staten Island is known as a borough

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WETLAND



TIDAL WETLAND

FRESHWATER WETLAND

MUDFLAT

GRASSLAND



UPLAND GRASS FIELD

SCRUB SHRUB

WET MEADOW

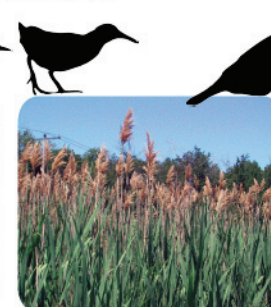
WOODLAND



SUCCESSIONAL WOODLAND



PALUSTRINE FORESTED WETLAND



PHRAGMITES FIELD (INVASIVE SPECIES)

OTHER

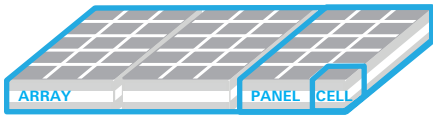
KEY



① Songbird (e.g. Indigo Bunting); ② Bird of prey (e.g. Red-tailed Hawk); ③ Waterbird (e.g. Mallard); ④ Wading bird (e.g. Great Blue Heron); ⑤ Marsh bird (e.g. Water Rail); ⑥ Grassland bird (e.g. Palm Warbler)

Small-scale solar at Freshkills Park: How it will work

Photovoltaic unit terminology



An **ARRAY** is a complete power generating unit made up of panels electrically connected to produce one electrical output.

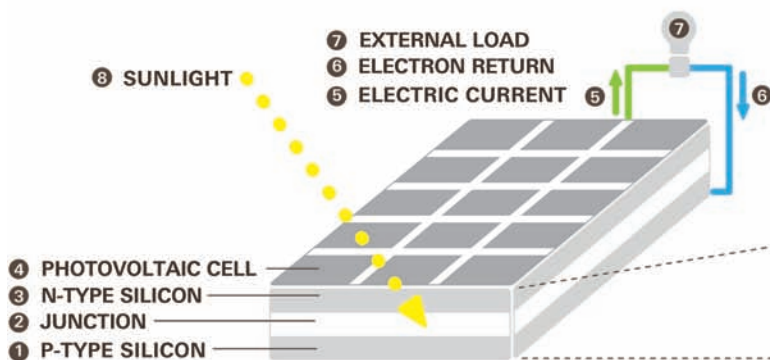
A **PANEL** or module is a group of photovoltaic cell circuits linked together.

A **CELL** is one complete photovoltaic circuit.

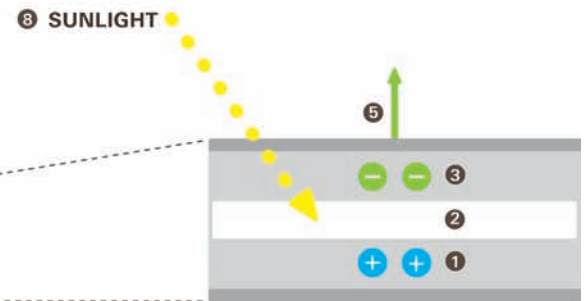
The Freshkills Park master plan calls for the use of renewable energy throughout the park. Various types of renewable energy, including energy captured from the sun, will be used to power many Freshkills Park facilities. Harnessing energy from the sun reduces the need for conventionally produced energy, thus reducing the carbon footprint associated with those types of energy production. There are multiple ways to convert sunlight into usable energy, such as solar water heating or by designing structures to optimize the passive solar heating and cooling of space. Another way to convert sunlight into usable energy is by directly converting it to power through the use of photovoltaics (PVs).

Photovoltaic cells get their name from the combination of the word photo, meaning light, and voltaic, meaning electricity. The cells are made of semiconductors such as silicon. When sunlight strikes a PV cell, photons are transferred to the cell, energizing the electrons and enabling them to escape their position in a given atom to join the current in the electrical circuit (see diagram below). The built-in electrical field in the PV cell, due to the adjacency of the P-type and N-type silicon (charge gradients) that are sandwiched together, provides the right amount of voltage needed to drive the current through an external load. Currently, several structures are planned for Freshkills Park that will use PVs to convert sunlight into power. Solar gates will use an array of PV panels to power lighting in the North Park and South Park parking lots. In addition, lighting for the North Park and South Park comfort stations will be powered by PV panels on the roofs of those structures.

PHOTOVOLTAIC PANEL



DETAIL VIEW OF PHOTOVOLTAIC CELL



This diagram illustrates a unit similar to that which will be used to harness power in Freshkills Park.

PV cells are made up of a series of layers. The first layer of silicon, P-type silicon ①, is designed to attract electrons. The junction ②, an electric field created by the movement of extra electrons and protons in the two layers of silicon, is created by the adjacency of the P-type silicon and N-type

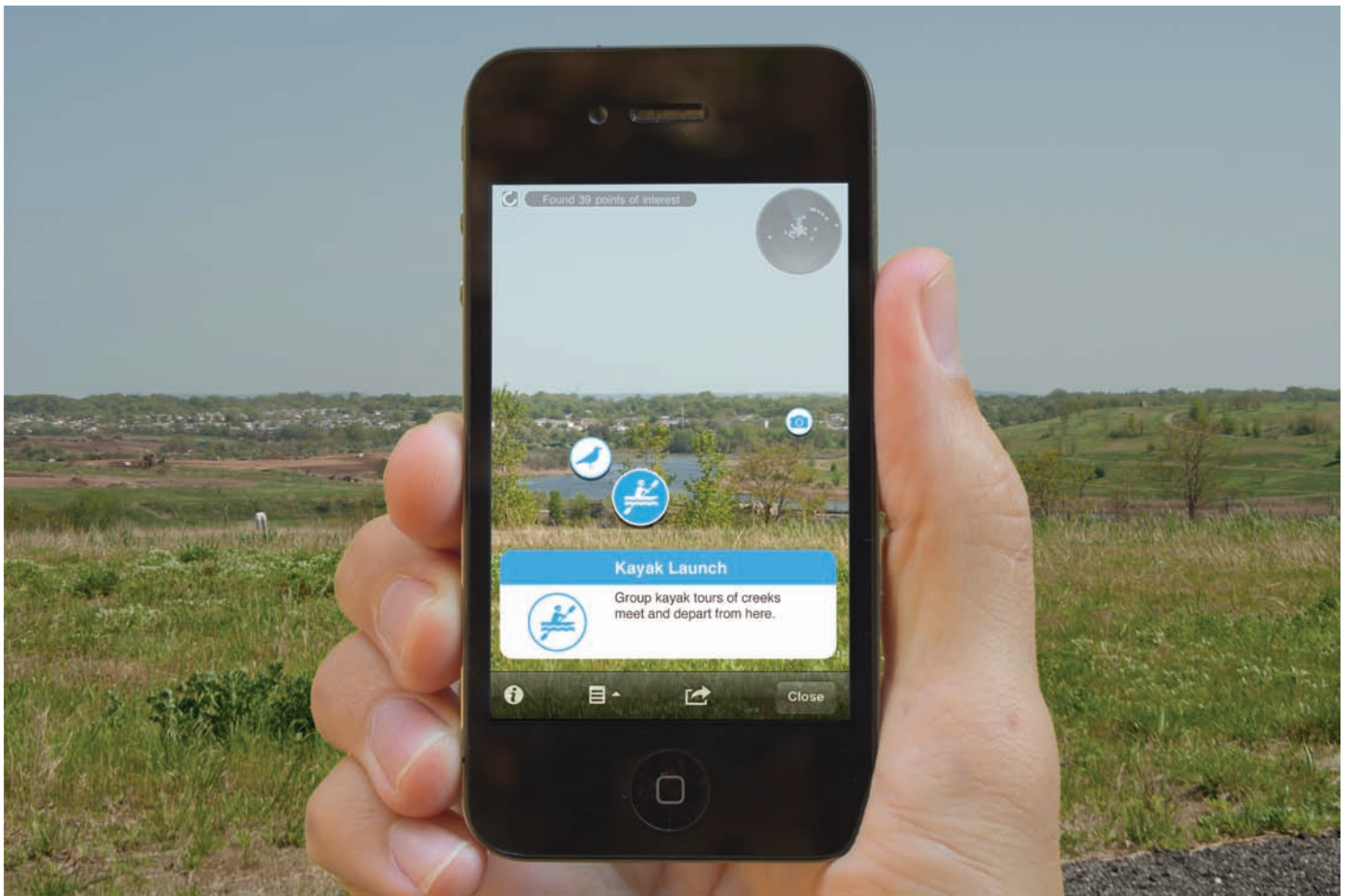
silicon ③, the next layer of silicon. The junction forces electrons to flow from the P-type side to the N-type side, but not the other direction. When light in the form of photons ⑧ hits the cell, each photon with enough energy will free electrons, further disrupting the cell's electrical neutrality. A rear metal contact is located on the under side of the P-type silicon layer, through which electrons return to the cell to complete the

circuit path. By providing a way for the electrons to return ⑥ to the P-type silicon, an electrical current ⑤ is produced and the cell's electric field causes a voltage, thus creating power, the product of current and voltage. An external load ⑦, an electrical circuit's output terminal, is a light bulb in the case of the lighting at Freshkills Park.



Above: A rendering of the future solar gate in North Park that will use photovoltaics to power lighting in the North Park parking lot.
Below: A rendering of the future comfort station in North Park, with photovoltaic panels on the roof.





Above: A view of the app that was developed by Carlos J. Gómez de Llarena from New York based media architecture studio Med44.

Freshkills Park+ : A digital guide to Freshkills Park

How to get the app

The app is free and easy to download.
<http://www.layar.com/layers/freshkills>

To get the Freshkills Park+ layer on your smartphone follow these steps:

DOWNLOAD the free Layar app on your smartphone.

OPEN the Layar app on your smartphone and search for Freshkills Park in the finder box.

TAP on the 'free' button to download the Freshkills Park+ layer.

TAP launch on the next screen and start exploring the next time you visit Freshkills Park on a public tour.

Freshkills Park+ is part of the Layar smartphone application (app), which allows Freshkills Park visitors to use their mobile device to explore various features of the site, including projects under construction, nearby bodies of water, buildings, bird sanctuaries, activities and panoramic views of the park.

The transformation of the former landfill into a park presents a unique challenge for visitors since the installation of many informational and educational signs and wayfinding components will come in the future as the park continues to develop. The solution this app provides is a virtual information system that consists of descriptive icons and texts overlaying the camera view of a user's mobile device. Visitors see only the relevant information based on where the device is pointing, acting like a smart compass that helps them virtually navigate the park and learn about recent developments.

Additional videos, photos, sounds and articles related to these sights can be accessed while Freshkills Park visitors walk around the diverse areas of the site. Step-by-step directions to reach any of the locations by foot or bike can also be provided in real time, making it useful for those who want to find their way to the nearest facility or learn more about what they are seeing within the vast, 2,200-acre landscape.

For a full schedule of upcoming opportunities to visit the park, please visit the Freshkills Park home page and click on the 'Tours and Events' tab.

The app was developed by Carlos J. Gómez de Llarena from New York-based media architecture studio Med44.

Wildlife Spotlight: Killdeer find new ideal habitat at Freshkills Park



PHOTO COURTESY OF ALLAN CLAYBON

Killdeer *Charadrius vociferous*

Range: Both coasts and the southern half of the U.S. into central Mexico and the Caribbean. Summer range extends north into Canada. Winter range extends south into northern South America, including the coastal regions of Ecuador and Peru.

Size: A slender and long bird with a large head. On average about 7-11 inches long with a 20-inch wingspan.

Preferred habitat: Killdeer are usually found in open, low lying areas in close proximity to a body of water such as grasslands, pastures, wetlands, golf courses, and parking lots.

Life span: Though known to live as long as 10 years, most live for 3-6 years.

A common sight throughout much of the United States, the Killdeer derives its name from the *kill-dee* sound of their call. It is a member of the *Charadriidae* family. With a brown back and wings, two black bands across its white chest, a white stripe along its brown head and small white “eyebrows,” the Killdeer is easy to identify. Males and females look alike.

To attract a mate, males will claim a breeding ground and perform a song and dance. Once paired, a couple will produce 3-5 eggs biannually, and participate equally in the 25-30 day incubation. Chicks are precocial upon hatching, meaning they are covered in down and able to run as soon as their feathers dry. Unlike many birds, Killdeer lead their young to feeding areas rather than feed them directly. Chicks will stay with their parents for up to 30 days.

The Killdeer’s diet consists of invertebrates, seeds, frogs and small fish. As a result of their tendency to nest in open areas, Killdeer are exposed to various threats, have developed unique defense mechanisms, and are quick and nervous. The “broken-wing” act draws predators away from the nest as the bird limps around until flying away. To ward off larger animals like cows and horses the Killdeer raises its tail, puffs up its chest, and charges.

Despite many potential human-related threats, their proclivity for human modified habitats has enabled them to live in changing environments, including semi-urban areas; their nests are often found in yards and gravel roofs. As a result they are a successful species and are not considered threatened.

Native flowering plants at Freshkills Park: How many can you identify?



Top row (left to right): Smooth Blue Aster (photo by John Beetham), Flat-top Goldenrod (photo by Betsy McCully), Common Evening Primrose (photo by Kelvin Chau);
Bottom row (left to right): Red Columbine (photo by Gregory Paul Johnston), New England Aster (photo by Bill Rogers), Butterfly Milkweed (photo by Peter C. Gorman).

Park hosts opportunities for birds and birdwatchers

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of parks and open space, making for particularly safe space for birdlife given the right habitats.

Because migrating birds make decisions from an aerial perspective, the addition of green space within the urban mosaic is particularly beneficial: there is likely a strong connection between Freshkills Park, Jamaica Bay, the Meadowlands, and Long Island Sound due to the tendency of birds to “prospect,” or shift over 10-20 miles during migration, often because of changing tidal regimes in coastal zones. Nearby Long Island Sound is a major focal point and wintering destination along the flyway, channeling transient birds to and from Freshkills Park along the Connecticut and Long Island sides of the sound.

BIRDING AT FRESHKILLS

The park currently hosts bi-monthly bird watching tours, co-led by Freshkills Park staff and naturalists from the Staten Island Museum. The future park will include a bird observation tower overlooking the wildlife refuge to the north and a host of other great outlooks for birdwatching. A study of bird populations at Freshkills Park is underway by Hunter College, and data is being gathered on nestbox-dwelling bird diversity and breeding success.

Continued urban development

has made functional, non-fragmented habitats for birdlife along migratory routes increasingly uncommon. The generation of new migratory stopover sites and protection of existing habitats are therefore increasingly crucial in providing space for successful cycles of avian migration, as well as accruing the ecological benefits bird species provide. As a coastal stopover within an urban-industrial context, Freshkills Park is primed to be a vital support for migration and behaviors of land-dwelling and coastal bird species alike. The many species already found at Freshkills Park attest to its unique capacity among the other open spaces of New York City to serve these critical ecological needs.

Seth Wollney, Program Associate at the Staten Island Museum, and Dr. Mark Hauber, Professor of Psychology at Hunter College and the Graduate Center of CUNY, contributed to the reporting of this story.

More about birding tours at Freshkills Park

For more information about future birding tours at Freshkills Park, visit the official park website, nyc.gov/parks/freshkillspark, and sign-up for our e-blast.



Top: A bald eagle soars above Freshkills Park.
Above: One of the nestboxes in use for a bird population study at the park by Hunter College.

FreshkillsPark

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Parks & Recreation
Michael R. Bloomberg, Mayor
Adrian Benepe, Commissioner

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www.nyc.gov/parks/freshkillspark
www.freshkillspark.wordpress.com

Project Partners
Department of Sanitation
www.nyc.gov/dsny

Department of City Planning
www.nyc.gov/dcp

Related City Initiatives
PlaNYC 2030
www.nyc.gov/planyc2030

MillionTreesNYC
www.milliontreesnyc.org

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