

fresh perspectives



FreshkillsPark Newsletter— Spring 2008



PlaNYC 2030 & Sustainable Freshkills Park

This article is the first in a series of articles that will discuss the sustainable initiatives in development at Freshkills Park.

“Sustainability’ is a word that’s used a lot these days. But at its heart, it simply means striving to make our city greater, not just for ourselves, but for those generations to come.” These were the words that New York City Mayor Michael Bloomberg used to define sustainability in a speech delivered on December 12, 2006 at the Queens Museum of Art. On Earth Day 2007, he unveiled the details of PlaNYC 2030, his long-term strategic plan for a “greener, greater New York.” The Mayor’s plan outlines several strategic goals, categorized under the headings Land, Water, Transportation, Energy, and Air. The Freshkills Park project offers an exciting opportunity to address and advance many of these strategic goals.

Land

The PlaNYC goals for land include providing more parkland and open space for New Yorkers, offering more recreational options in parks, and converting contaminated brownfields to usable land. The conversion of the Freshkills site from landfill to park is of course a potent example of environmental remediation of a site for reuse. While it is certainly not the first landfill-to-park project in the world, or even in New York City, the vast size and unique scope of the Freshkills Park project make it stand out. Formerly the world’s largest landfill, the reclamation of the land for parkland will be the city’s largest parks expansion since the 1890s when a large chain of parkland, that includes Pellham Bay and Van Cortland Parks, was developed in the Bronx. Freshkills Park will offer a host of recreational opportunities for Staten Islanders and all visitors.

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Above: A view of Manhattan from Freshkills Park. The transition of Freshkills from landfill to park presents unique opportunities to showcase sustainable design and technologies, in line with PlaNYC’s strategic goals for the city.

PlaNYC 2030 & Sustainable Freshkills Park

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In addition to advancing the PlaNYC goals for increasing the city's parkland, the plans for Freshkills Park will include designs that involve sustainable ecological and landscape management. This can encompass a variety of techniques that include enhancing wildlife habitat, utilizing native, non-invasive plant species, and employing best management practices that minimize the effects of ongoing site use on the surrounding natural environment. The habitat revitalization proposal in the 2006 Freshkills Park Draft Master Plan (DMP) indicates three landscape types indigenous to Staten Island that will be created on the site. These wetlands, grasslands, and woodlands will be planted with hardy native species. Because native plants have evolved to survive in their respective landscape, they require no irrigation or fertilization once they are established, are generally resistant to local pests, and many enrich the soil, discourage erosion, and provide food and habitat for native fauna. Currently the Greenbelt Native Plant Center is hard at work collecting native seeds from plant populations throughout NYC for future use at Freshkills Park.

Water

PlaNYC's focus on water is two-fold. One aspect concentrates on water quality and includes goals of restoring our natural waterways, for recreational purposes as well as for fresh water sources, and improving stormwater management. The other piece looks at our water network, with goals focusing on conservation, watershed protection, and infrastructure improvements. At Freshkills Park, the bulk of recreational activity is planned in the heart of the park at the confluence of Fresh Kills and Richmond Creek. The plan includes access to the water via boardwalks, piers, marinas, and boat launches. One of the highlights of Freshkills Park will be the wetland areas. As envisioned in the DMP, over 350 acres of the park are slated to be reserved as natural wetland or salt

marsh, providing parkgoers with a unique experience in an urban park, as well as the natural flood management and pollution filtration benefits that these habitats offer.

The Freshkills Park plans also include a number of Best Management Practices, or BMPs, to control the volume and quality of stormwater on site. Through structural or nonstructural designs, BMPs can be used to prevent or minimize the amount of sediments, nutrients, and pollution entering both surface and ground water. These design elements include rain gardens, infiltration trenches, porous asphalt and pervious pavement. The DMP specifies that parking areas at the site will have permeable surfaces, which will help to manage surface runoff. Schmul Park, which is part of the first phase of North Park development, will also incorporate BMPs such as permeable surfaces and a rain garden; these practices will set a precedent for the future development of playgrounds and the more actively programmed areas of the park.

Finally, Freshkills Park will strive to showcase innovative water conservation techniques, such as rainwater harvesting, in which rain is captured and filtered for uses such as irrigation, and grey water treatment, in which wastewater – excluding wastewater from toilets – is filtered and recycled for limited use.

Transportation

Improving transportation networks to meet the needs of a growing population is a large part of the PlaNYC initiative, as is encouraging alternative modes of transportation to address environmental sustainability as it relates to NYC's transportation needs. The Freshkills Park plan includes the development of a system of parks roads that will provide scenic access to the park's recreational opportunities, but traffic issues and an opportunity to provide some additional connectivity to Staten Island's existing

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Fresh Perspectives 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, and 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 its history and some of the unique features, resources and complexities of the site.

road network are also being considered as plans progress. Freshkills Park also provides an opportunity to foster an increased interest in cycling, as both a recreational activity and an alternative means of transportation. The DMP includes plans for 13 miles of multi-use paths and additional development of specially designated paths for on-road and off-road biking. The main multi-use circulation network will be directly accessible from most of the major park entrances. The Freshkills Park bike paths will provide a space for recreational biking as well as connectivity to the DOT's proposed bike routes on Richmond Avenue.

Energy

PlaNYC's energy initiatives include expanding clean distributed energy generation ("Clean DG"), fostering the renewable energy market, and increasing energy consumption and conservation awareness. Conditions on the Freshkills Park site offer unique possibilities for advancing these goals and providing models for future energy sourcing and conservation. The methane gas produced by the decomposition of organic landfill matter is already collected and processed to pipeline quality for domestic use in Staten Island at an onsite landfill gas recovery plant. Additionally, consulting engineers have conducted a study to determine other possibilities for generating energy onsite through sustainable means. The draft study, completed in October 2007, includes site-specific assessments for wind power, solar power, biomass, fuel cells and sustainable building technologies. (We will be running a series of articles this year highlighting each of these technologies and their implications for Freshkills Park. See our summary on WIND POWER in this issue!)

Air

In regards to cleaner air, PlaNYC includes many regulatory goals involving emissions reductions. But it also calls for remedial and preventative environmental efforts such as reforestation. The creation of new and diverse native botanical habitats at Freshkills will greatly augment efforts like the city's Million Trees NYC initiative.

Beyond PlaNYC 2030

The Mayor's plan provides a solid framework to aid city officials, planners, workers and residents as they strive for a more sustainable New York City. As such, it addresses the circumstances and challenges unique to this city and its residents. The planners and champions of the Freshkills Park project envision a park that is an asset, resource and unique environmental exemplar for not only New York, or even the United States, but for all the world. Going beyond the goals of PlaNYC, Freshkills Park offers an opportunity to address other important sustainability issues such as waste management, recycling and broader education.

Freshkills Park's history as a landfill makes it an especially ideal place to emphasize the importance of waste reduction, material reuse, and recycling to long-term sustainability. As park plans move closer to the construction phase, the



A rendering of the site illustrates how revitalized wetlands and other natural habitats will provide ideal outdoor classrooms for environmental education.

Freshkills Park design team will be examining numerous ways to source necessary construction materials, including reusing materials from the site or other local sites, using recycled materials, and finding sustainably harvested new materials.

Already the team is researching sustainable ways to source the thousands of cubic yards of soil that will be needed for final cover of the landfill mounds. At Schmul Park, the design team is looking into the use of sustainable materials, including sustainably harvested wood for benches and recycled materials in pathways.

Freshkills Park presents us with a great opportunity to showcase and pursue a sustainable future for Staten Island, New York City, and the world.

Once Freshkills Park is open to visitors, its history as a landfill will not be forgotten. The DMP includes plans for programs and installations that will highlight the park's history, transformation and ongoing maintenance with regards to the landfill. These physical reminders will provide a platform on which to build a broader educational program addressing issues of sustainability. Such a program could be especially poignant at Freshkills Park, a landscape literally shaped by the city's garbage.

The hope is that the creation of urban parkland at Freshkills Park will provide New York City and the Staten Island community not only with playgrounds and ball fields, but with a unique natural and cultural resource that transcends the park's boundaries through education and advocacy for the natural landscape and sustainable practices. This project presents us with a great opportunity to showcase and pursue a sustainable future for Staten Island, the greater New York City community, and the world.

Sustainable Energy at Freshkills Park: Wind Power

There is no doubt that the buzz about renewable energy resources is growing; with the current concern over global warming and the debates over the energy bills in Congress, everyone is talking clean energy. Amidst this talk, wind power is emerging as the fastest growing renewable energy technology. According to the American Wind Energy Association, over the past five years, the wind power industry has seen a 22% growth in the US. They estimate that 31 billion kW of wind power have been generated in 2007, or enough power to serve the equivalent of approximately 3 million average US households.

Wind power is just one of the many sustainable technologies that the Freshkills Park team, with the help from environmental engineering consultants, is exploring to reduce the impact of the development of the park and to distinguish it as a model for future sustainable parks. Preliminary analysis on the site has suggested that there is a good possibility for efficiently generating energy using wind turbines. The unique conditions at Freshkills however require special considerations for any construction and development, and the infrastructure needed to produce wind energy is no different.

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The most important factor in determining potential for wind power is wind speed. Wind speed monitoring at Freshkills between April 2006 and March 2007 showed that the average wind speed was 6.15 m/s at an elevation of 60m. Higher wind speeds are usually recommended for efficient energy production, especially for large turbines, however the high cost of electricity in this region may actually offset the site inefficiencies.

Energy generation increases with turbine size and small (micro), mid-sized, and large turbines have been analyzed for the site. Micro-turbines are generally less expensive and have lesser maintenance costs, but they are also less efficient. It would take about 15 micro-turbines to power a 10,000 square foot visitor center on the site. Analyses show that a mid-sized turbine would probably be able to supply power for a small building, but it would require 50 turbines throughout the site to meet the entire site's energy needs. Four or five large turbines would likely be able to meet the park's energy requirements, but these turbines can be very large (over 400 feet tall) and require significant foundations. The large turbines would also most likely have to be sited atop

the landfill mounds in order to be at an efficient elevation.

No single technology will be able to meet all of the energy needs for the entire park. According to the report on sustainable technologies authored by sustainability consultants, "the solution is likely to lie in mosaic of technologies and solutions which suit particular applications in the park, the available natural resources, costs, the community, and local regulation." While future studies are needed, right now some form of wind energy looks like a promising piece of the mosaic of technologies that will one day power a sustainable Freshkills Park.



Small wind turbines, like this one, may be a viable option for powering individual buildings on the site.



Four or five large turbines, like this one, may be able to generate enough energy to provide power to the entire park.

PHOTO BY DAVE SHARPE

The Redesigned Schmul Park

Nestled within the Travis neighborhood, the existing two-acre Schmul Park has been redesigned as part of North Park's development. It will be the first project to start construction at Freshkills Park. Now a park composed largely of blacktopped surfaces with little green space, the new plan aims to create a greener park with softer, more engaging play areas. The goal of the redevelopment of Schmul Park is to create an open park for the community and to connect the neighborhood with the rest of Freshkills Park. Another important objective of the park is to be as environmentally conscious as possible.

The perimeter of the park will be composed of natural materials, which is in contrast to the synthetic materials that will be used in the interior of the park in areas like the playground. The play area will be topographically dynamic, as it will contain a series of rubber-clad concrete mounds. The largest mound will be 6 feet in height and contain a slide. A spray shower and different kinds of playground equipment will also be features of the play area.

Other areas of the park include a large lawn, handball courts, and basketball courts. The courts will have custom fencing set at a 15 degree angle. This variation causes the space inside of the fencing to feel larger than traditional courts. The current perimeter chain link fence at Schmul will be removed to create a more open and inviting recreation area.

The play areas are each in the shape of an ellipse. The use of ellipses as opposed to more traditional shapes is to create a more playful and inviting space. Large, long benches will provide ample space for seating.

Schmul Park will also contain a new comfort station and a rain garden to collect the water from the roof of the building. This is a sustainability initiative to utilize rainwater for irrigation purposes. There will be flowering meadows, native grass areas, and a small pine tree grove. The different types of hardy native grasses and flowers to be planted will provide color gradients throughout the year.

The materials that are to be used in the construction of the park were chosen in an attempt to be as environmentally aware as possible. Permeable, porous materials are going to be used because they allow rainwater to be absorbed into the ground below instead of creating runoff. Porous concrete will be used for the sidewalks, crushed slag for the interior plaza areas of the park, and poured rubber will be used in the playground. A flexible pavement made of pieces of rubber tires and an aggregate will be used at the basketball and handball courts.

Schmul Park construction is anticipated to begin late 2008.



Top: Today the park is mostly cracked asphalt and chainlink fence.

Middle: The schematic design of Schmul Park shows the unique elliptical elements of the layout.

Bottom: A rendering of the park's proposed play area.

Invasion of the Habitat Snatchers

Due to the high levels of disturbance that has occurred on Freshkills Park throughout the years, many sections of the site contain invasive species. More often than not, the presence of invasive species signals a decline in ecosystem productivity, health, and biodiversity. The term invasive species refers to non-indigenous species that are introduced to an area (usually by means of a human action), become capable of reproducing on their own in the new environment, and eventually thrive. Invasive species are often associated with highly disturbed landscapes, where they can colonize open land quickly, out-competing native plants and animals. On a visit to Freshkills Park, one sees patches of the invasive species phragmites and mugwort dominating what was historically spartina marsh, while invasive tree-of-heaven and hybrid poplars dominate drier uplands.

As construction and remediation progresses at Freshkills Park, management of invasive plants will become an issue of great importance.

Other prevalent invasive species at the site include Purple Loosestrife, Japanese Knotweed, Common Buckthorn, and Paulownia. Callery Pear and Olive trees are emerging as invasive species. These species are undesirable for a variety of reasons. These non-indigenous species aggressively crowd out their native counterparts, and then contribute to an “up-the-food-chain effect,” in which the absence of native plants as habitat and food contributes to an overall decline in species up the food chain. For instance, many insects—which often interact with plants first in the food chain—have plant-specific diets, and cannot feed on invasive flora. There is often a curious absence of insects and arachnids when walking through a phragmites forest at Freshkills Park. The lack of herbaceous insects eventually leads to a decline in populations

of predatory bugs such as dragonflies, as well as birds, reptiles, and amphibians. Further, many birds that would naturally nest in spartina marsh or upland brush will not nest in phragmites, although the Red-winged Blackbird proves to be an exception.

Traits that are thought to be common among invasive species include the ability to reproduce both asexually and sexually, rapid growth, early sexual maturity, the ability to disperse young widely, and a high tolerance for a wide range of environmental conditions. Further, a non-native species may be inedible to native fauna, and the lack of predation may allow the species to gain the upper hand in an ecosystem. Some invasive species can actually create unfavorable conditions for neighboring plants through a process known as allelopathy, in which a plant will secrete chemicals into the soil that create uninhabitable conditions for other species.

As construction and remediation progresses at Freshkills Park, management of invasive plants will become an issue of great importance. Invasive species control will likely be extremely difficult, requiring a regular plan of maintenance. Historically, the Northeast is comprised mostly of forest, with scattered meadows. Due to the fact that the meadow is not the dominate landscape for this region, it will be easier for aggressive invasive plants to colonize the mounds than their forest-dwelling counterparts. At Freshkills, the off-mound forests house a much smaller percentage of invasive plants than do the grasslands. In order to preserve the artificial “prairies” of the four landfill mounds, a maintenance plan will be needed that controls the spread of invasives.

The conversion of the current grasses to native meadows would help to improve ecological resources and habitat and may reduce costs of mowing and long-term maintenance. Over time, it is proposed to cultivate a diverse range of wetland, grassland, and woodland communities to ensure biodiversity.



Phragmites at Freshkills Park line the bank of a creek.

In some phragmites-dominated areas, physical removal of the plants followed by a cover of clean soil might effectively control the plants. Plants that thrive in full sun such as phragmites and mugwort can be controlled by planting a tree canopy over them to block out the sun. Invasive trees can be cut down, their trunks left to decompose and become microenvironments on the forest floor. A regular mowing schedule on the mounds can help prevent shrubs and trees from gaining ground. According to ecological consultants, chemical removal of plants through the application of herbicide should always be considered a last resort.

Ecological consultants for the project have been conducting site investigations at Freshkills to create a map of the present ecological conditions on site. Their fieldwork includes noting what types of ecosystems are located on site, what plants dominate these ecosystems, and which areas are overrun with invasives. Their final map will be comprised of many layers, including soils, hydrology, topography, and vegetation, and will be useful in determining the most practical areas for future park development. When considering design and programming of the park, the consultants recommend placing athletic fields and structures in areas that are already inundated by invasive species in an attempt to eradicate the plants. This is another part of the solution to preserve the forests, wetlands, and clay barrens that are the native ecosystems of Staten Island.

Wildlife Spotlight: Red-tailed Hawks



PHOTO BY BRIAN TANG/WWW.HARDRAIN1.COM

Red-tailed Hawk *Buteo jamaicensis*

Range: Found throughout the United States and Canada, and parts of Mexico and Central America

Size: 17 to 25 inches in length with a wingspan of 4 feet; females are 25% larger than males

Preferred habitat: Open areas with elevated perches, pastures, urban parks, and deciduous woodlands

Lifespan: average 21 years in the wild

Red-tailed Hawks have been spotted at Freshkills Park! The hawks are known for their brick-colored tails, even though not every one of the 14 subspecies has this characteristic. The underbelly is lighter than the back and the bill is dark and short.

Hawks use their powerful claws as weapons to hunt for their diet, which mostly consists of small rodents. Mammals as large as cottontail rabbits are considered prey and, in addition to small rodents, have been spotted at Freshkills Park. The hawks play an important role in the local ecosystem as they help control the population of small mammals.

The male and female construct their nest in a tall tree and will use a cliff ledge or building when trees are scarce. The nests are built out of pine needles, bark, twigs, and other soft plant matter. Hawks are very territorial and will soar over their territory looking for intruders. This is intensified during the winter months when hunting is difficult. While soaring at high altitudes the hawk typically travels from 20 to 40 mph. This speed increases to as high as 120 mph when the hawk is diving.

Hawks have adapted to human habitats by utilizing telephone poles to perch on and using the open spaces along the roadside to hunt. A perfect example of this has been seen at Freshkills. The hawks utilize the open landscape to feed on their prey.

Plants at Freshkills Park: How many do you know?



- A: Goldenrod
- B: Milkweed
- C: Northern Bayberry
- D: Mugwort
- E: Poison Ivy
- F: Phragmites
- G: Southern Arrowwood

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Upcoming Public Review Milestones

Spring 2008:

- Draft Generic Environmental Impact Statement (DGEIS) released for public review and comment
- Application to officially map the site as City parkland released for public review and comment. The Uniform Land Use Review Procedure (ULURP) commences.

Summer 2008:

- A series of public hearings held by SI Community Boards and Borough President, City Planning Commission, and City Council to take comments on the DGEIS and proposed land use changes.

Fall 2008:

- Final Generic Environmental Impact Statement completed and released.
- City Planning Commission and City Council vote on ULURP Application.

Freshkills Park Project

Department of Parks & Recreation
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NYC Green Apple Map
<http://www.greenapplemap.org/>

NYC WasteLe\$\$
http://www.nyc.gov/html/nycwasteless/html/recycling/recycling_nyc.shtml

PlaNYC 2030
<http://www.nyc.gov/planyc2030/>

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