

3540 3 Little Bakers Blvd, Wilmington, DE, 19808



Resurgence & Revival
at
3 Little Bakers Golf Course

James Hill | LARC Capstone
Instructors: Lori Athey / Anna Wik
Committee: Dr. Erik Ervin / Mike Benkusky

Acknowledgements

Thank you to all my committee members: Dr. Erik Ervin, Mike Benkusky, Lori Athey, Anna Wik. All have provided me with excellent guidance throughout the entire capstone process. Secondly, I would like to thank all the professors at UD that have impacted me, including but not limited to: Dr. Eric Bardenhagen, Zachary Hammaker, Dr. Susan Barton, Dr. Jules Bruck, Anna Wik, Lori Athey, Dr. Carmine Balascio, Rodney Robinson, and more.

Thank you to the University of Delaware, the College of Agriculture and Natural Resources, and Landscape Architecture program. I am so grateful to have been able to attend school here and I will never forget what I've learned, the advice I've received, and the friends I made along the way.

A Master Plan
for
3 Little Bakers Golf Course and Community
Pike Creek, Delaware

Submitted by:
James Hill
May 2023

Bachelor of Landscape Architecture Program
Department of Plant and Soil Sciences
University of Delaware





Contents

Introduction

- Abstract.....01-02
- Mission, Goals, Objectives.....03
- Context Mapping.....04-05
- Pike Creek & 3 Little Baker's History.....06-07
- What is golf?.....08
- Research Briefs & Case Studies.....09-21

Inventory & Analysis

- GIS Mappings.....23-25
- Demographic Analysis.....26
- Site Scale Analysis & Inventory.....27-30

Design Development

- Master Plan.....32
- 9 Hole Reversible Golf Course.....33-35
- Ecological Corridor.....36-37
- Community Park.....38-39
- References.....40

A scenic view of a golf course green and fairway surrounded by dense trees. The green is in the center, with a sand trap to its right and another to its left. A path or stream runs along the bottom right. The background is a dense forest of trees under a bright sky. The word "Introduction" is overlaid in white, italicized text in the center.

Introduction

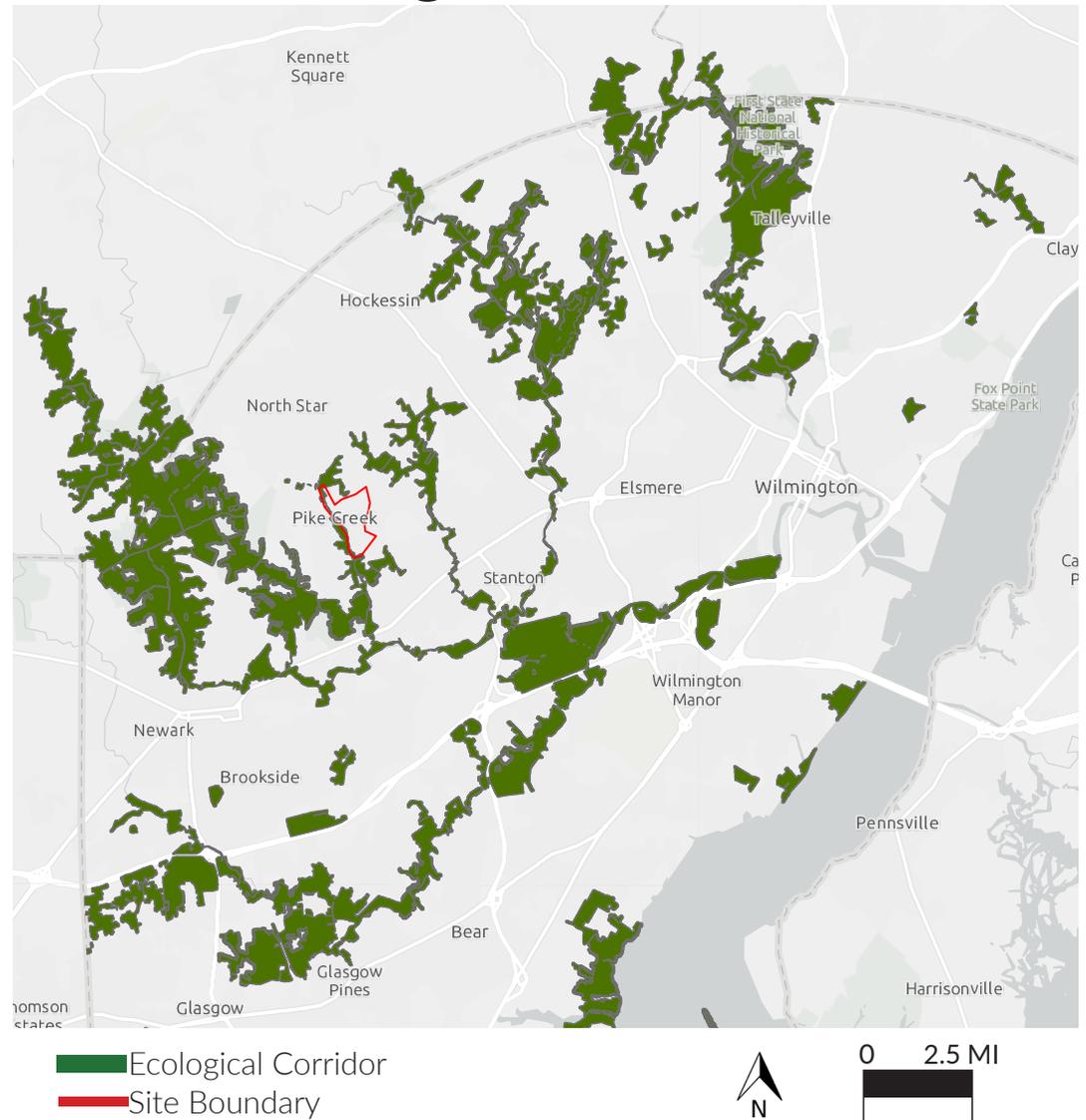
Abstract

Delaware's overall forested acreage is shrinking—primarily due to development. Many forests across the state have either disappeared or become so fragmented that they no longer provide substantial natural benefits (Delaware Forest Service, 2020). In addition, many riparian forest habitats have been reduced so significantly that waterways are no longer buffered. Due to this increase in development, ecology and wildlife are suffering. With new development comes the loss of forested corridors that act as protected travel routes for many wildlife species.



Located along the **Delaware Ecological Corridor**, Three Little Bakers Golf Course and surrounding developments are a prime example of this disconnection of habitat. Historically, golf courses have been viewed negatively with regard to environmental impacts, due to reliance on herbicides and pesticides, deforestation, and the carbon footprint associated with mowing. However, recent studies have shown that golf courses have the potential to positively impact their environment by recreating native habitats and providing on-site stormwater management (Kohler, Poole, Reicher, & Turco, 2004) (Hodgkison, Hero, & Warnken, 2007)

Ecological Network



Mission, Goals, and Objectives

This project will adaptively reuse the existing framework of the abandoned Three Little Bakers Golf Course to enhance the ecology and habitat of native wildlife while connecting the property to the larger forested corridor surrounding the site. The new 9-hole naturalistic reversible course and facilities will provide recreational, ecological, and cultural opportunities in addition to a protected habitat inaccessible to users.

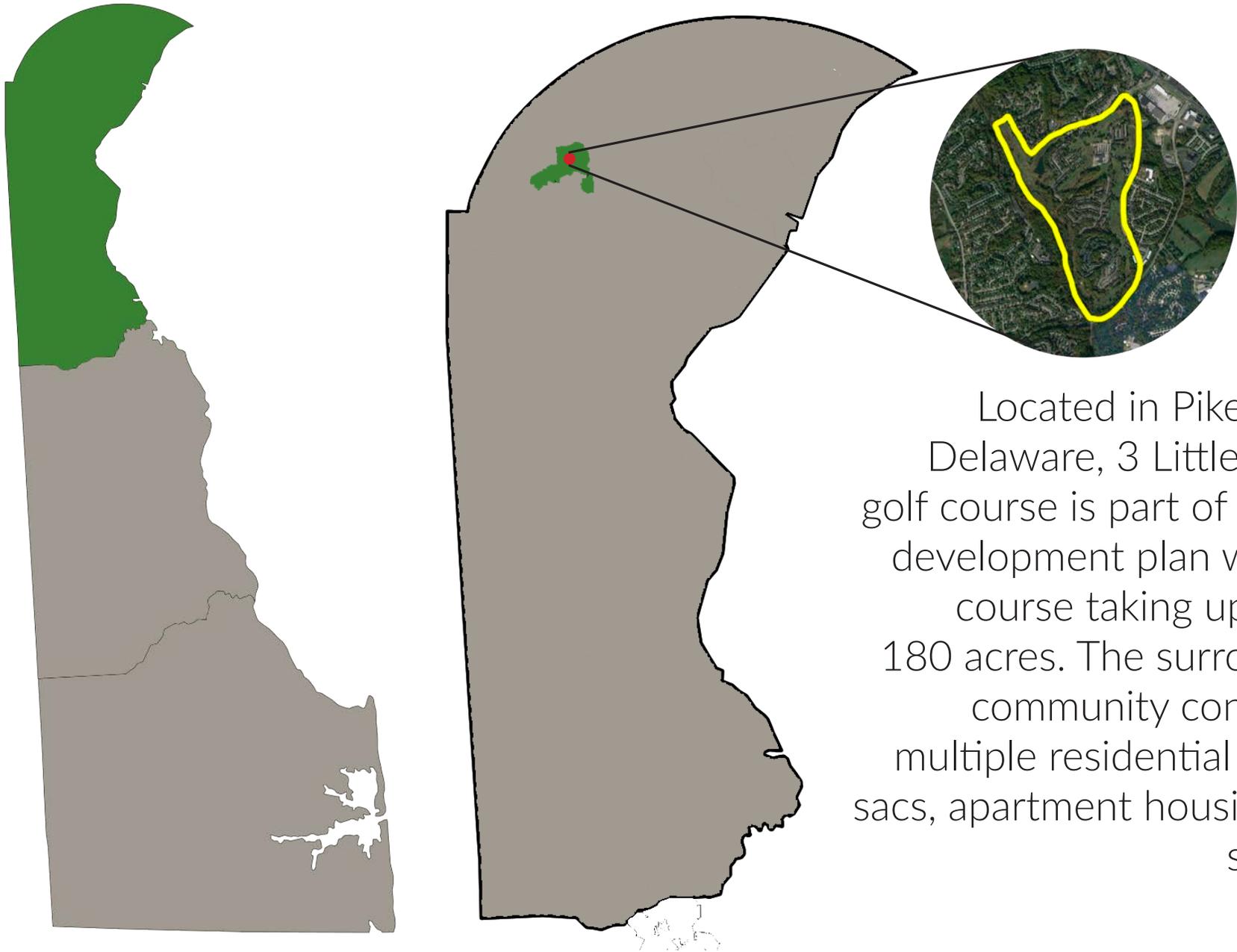
GOALS

- Protect and enhance habitats
- Provide recreational and educational opportunities for community members
- Connect to surrounding schools and parks
- Improve stormwater management and water quality on site

OBJECTIVES

- Design course to limit blueprint of unnatural manicured land while providing interesting features for users
- Protect native wildlife and ecology through the creation of buffers, reforestation, and connection between habitats
- Provide recreation opportunities for community members through multi-use courts, gardens, greenspace, and walking/biking trails

Context Map

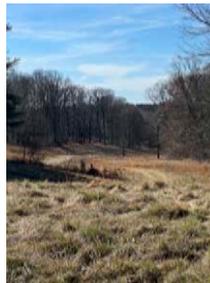


Located in Pike Creek, Delaware, 3 Little Bakers golf course is part of a larger development plan with the course taking up nearly 180 acres. The surrounding community consists of multiple residential cul-de-sacs, apartment housing, and schools.

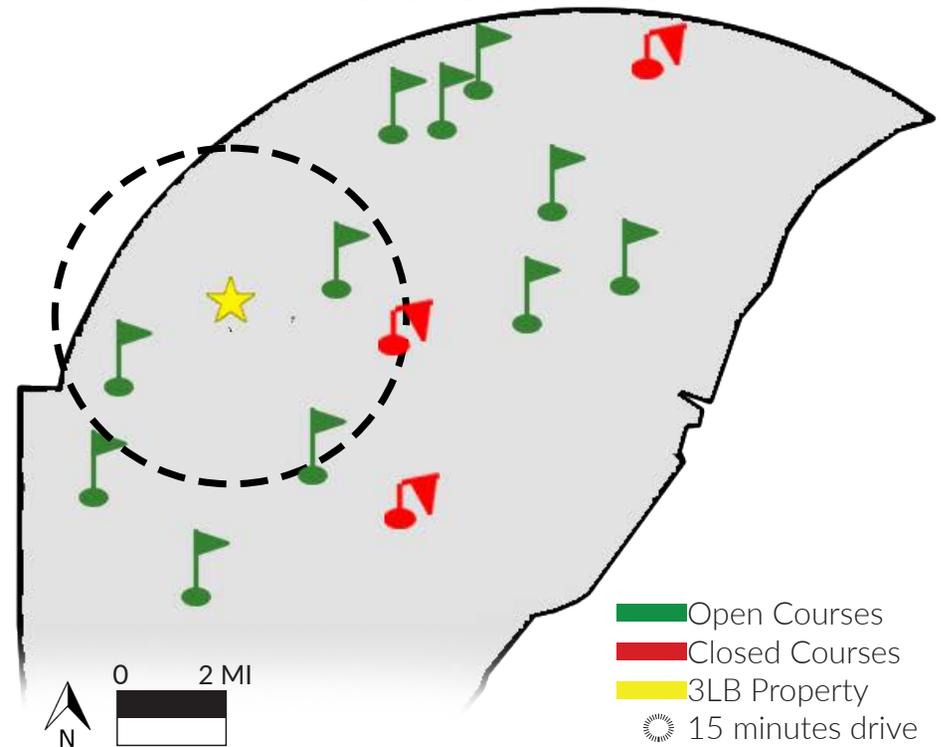
Site Map

Site Extents

180 Acres of Open Space
Medical Center



NCC Courses



There are 15+ courses in New Castle County. 3 Little Bakers Property is located within 15 minutes of three courses that are open, and one that is also currently closed down.

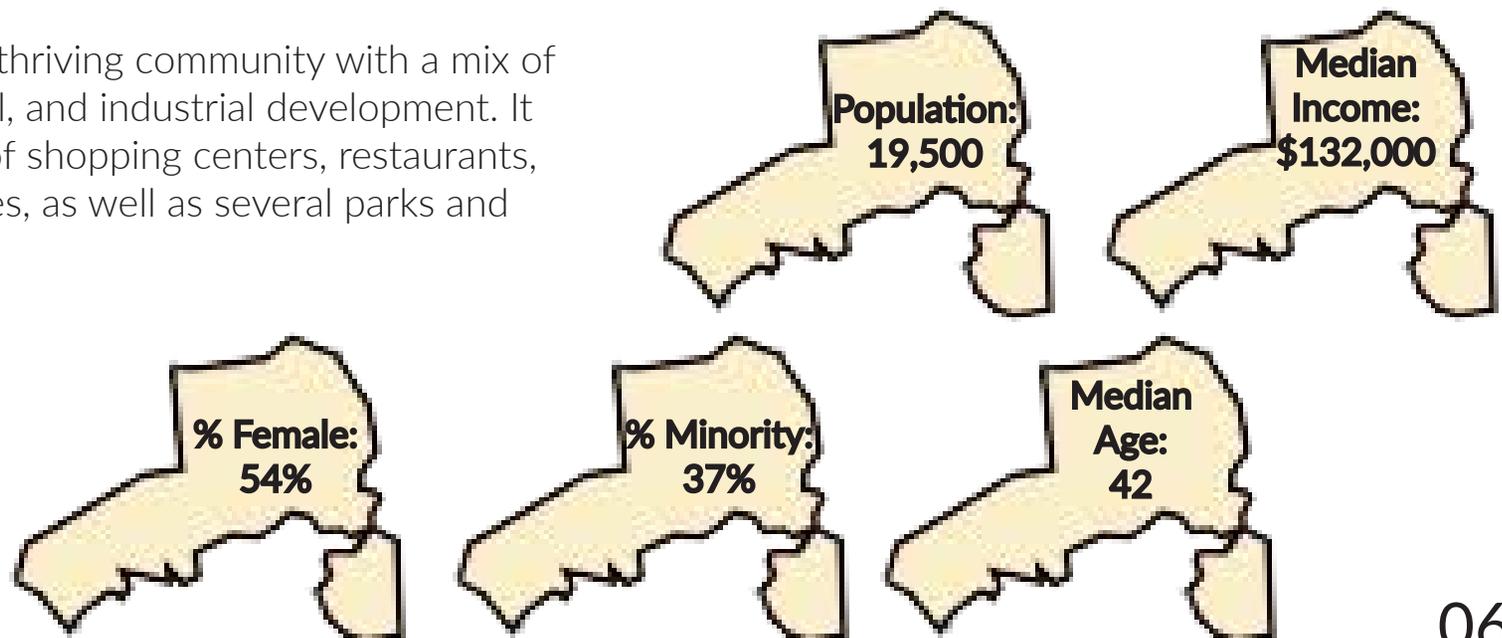
Pike Creek History

Pike Creek is a community located in New Castle County, Delaware, United States. The area that is now Pike Creek was primarily an agricultural community until the mid-20th century.

The name “Pike Creek” comes from a creek that flows through the area, named after the pike fish that inhabit it.

In the early 20th century, the area began to experience suburban development, as people began to move out of Wilmington and into the surrounding countryside. Pike Creek remained a rural area for many years, but in the 1960s and 1970s, a wave of residential and commercial development transformed the area.

Today, Pike Creek is a thriving community with a mix of residential, commercial, and industrial development. It is home to a number of shopping centers, restaurants, schools, and businesses, as well as several parks and recreational areas.



3 Little Bakers Golf Course History

The 3 Little Bakers Golf Course, which was established in the 1970s, was a public course that featured 18 holes and was known for its challenging layout and scenic views. In addition to the course it was home to the 3 Little Bakers Dinner Theater owned by the Immediato brothers. The brothers got their start forming a show business tumbling act and performed as The Acromaniacs. They appeared on Broadway in the Paramount Theatre, Radio City Music Hall and other East Coast venues. Eventually they created a dinner theater to perform and serve sweets from their bakeries throughout the state. Closed in 2010 because of new ownership's desire to create a housing development, the property is currently unused open space. Since its closure there have been multiple development attempts, however, they have all been denied due to the open space/recreational zoning requirement in the 1971 master plan for the land. Although it is abandoned, many community members can be found walking the trails daily.



2009 Aerial

Front 9 Back 9 Clubhouse

71 par	6,748 yards	73.5 rating	136 slope
------------------	-----------------------	-----------------------	---------------------



	Championship	Tournament	Middle	Forward
●	6,748	6,310	5,963	5,192
●	73.5/136	70.7/130	69.7/126	65.9/118
●	71	71	71	72

The 18 hole course was a par 71, totaling 6,748 yards of length from the championship tees. The corridors for the golf holes weave around the housing developments eventually connecting back to the clubhouse.



What is Golf?

History of Golf

Recreational golf in the United States has a long and rich history that dates back to the late 1800s. During the 1920s, golf experienced a surge in popularity, thanks in part to the success of legendary golfers like Bobby Jones and Walter Hagen. This led to the construction of many new golf courses and the establishment of several prominent golf associations, including the United States Golf Association (USGA) and the Professional Golfers' Association (PGA).

The popularity of golf continued to grow throughout the mid-20th century, with the sport becoming more accessible to the general public thanks to advancements in equipment and course design. Golf also gained increased media attention, with televised broadcasts of major tournaments becoming a staple of American sports programming.

In recent years, the popularity of golf has seen a decline due to a variety of factors, including the rising cost of equipment and course fees, and competition from other leisure activities. However, the sport still has a dedicated following, and there are thousands of golf courses throughout the United States that continue to attract players of all ages and skill levels.

Current State of Golf

One of the major factors contributing to the decline in golf's popularity has been the rising cost of playing the sport, including greens fees and equipment costs. Additionally, changing demographics and the availability of other leisure activities have also contributed to the decline in the number of golfers.

Despite these challenges, many golf courses and resorts in the United States have adapted by offering new services and amenities to attract players. This includes offering more affordable rates and introducing programs to encourage beginners to take up the sport.

During Covid-19 there has been a resurgence in the popularity of the sport, and the amount of golfers has increased dramatically.

Through resilient design many of the historical issues that plagued golf courses in the past can be mitigated. My design at 3 Little Bakers Golf Course can provide a blueprint for sustainable and inclusive golf course facility design for the future.

33.5 million people played a round of golf in america in 2018

434 million rounds of golf were played in 2018

3.5 billion dollars have been invested into golf since 2006

75% of golf course facilities are open to the public

6% increase in nationwide total of golfers since Covid-19

Research Briefs & Case Studies

Research Briefs

Creating Habitat on Golf Courses

Taking Golf out of Golf Course: Trajectories to Convert Facilities to Parks and Open Space Preserves

Summary Paragraph/Abstract

- This article discusses the potential for repurposing golf courses after they decline and eventually fail. Over 1,500 golf courses in America have closed in the past ten years, and as golf's popularity declines, there is increasing interest in finding new uses for these spaces. The article explores various examples of golf course conversions, including urban farms, solar energy facilities, and community gardens. The author also discusses the challenges involved in repurposing golf courses, such as zoning regulations and community resistance to change.

Major Points/Topics

- Golf Courses are facing declining profitability due to changing demographics and the popularity as a sport
- The author argues that repurposing golf courses for nature-based recreation can provide economic benefits through tourism, job creation, and tax revenue, while also promoting ecological benefits such as habitat restoration and biodiversity conservation.
- Golf course face many challenges, including land-use conflicts, environmental impacts, and water use.
- The article concludes that repurposing golf courses for nature-based recreation can offer a viable alternative to struggling golf courses, providing economic and ecological benefits to local communities and the environment.

Author: Kelly Cederberg

Source: Cederberg, K (2017) Taking golf out of golf course: Trajectories to convert facilities to ... (n.d.). Retrieved February 12, 2023, from <http://thecela.me/wp-content/uploads/214F.pdf>

Design Implications for Three Little Bakers Re- vitalization

- All plans for new parks prioritize trails as a major amenity
- 33% of the successful reused golf courses had a revenue source in their new designs (pavillions, clubhouse rental, pay-to-use disc golf) and many wanted to add them
- Parks that emphasize conservation and replanting noticed an immediate boost in bird/mammal abundance.

Natural Links: Naturalistic Golf Courses as Wildlife Habitat

Summary Paragraph/Abstract

- The article discusses the benefits of designing golf courses with naturalistic elements to provide wildlife habitat. Golf courses can serve as important refuges for wildlife, as they often occupy large areas of land and can be managed to provide diverse habitat types. Examples of naturalistic elements that can be incorporated into golf course design include native vegetation, wetlands, and riparian zones.

Major Points/Topics

- Naturalistic golf courses successfully blend golf with nature and wildlife.
- When designing a naturalistic course many things need to be considered including water management, vegetation management , and wildlife management.
- Increased biodiversity: Naturalistic golf courses can provide habitat for a wide range of plant and animal species, resulting in increased biodiversity.
- Enhanced aesthetics: A naturalistic golf course can offer a more visually appealing experience for golfers and visitors, with natural features like wetlands, meadows, and woodlands.

Author: Max Terman

Source: Terman, M. R. (1997). Natural links: Naturalistic golf courses as wildlife habitat. *Landscape and Urban Planning*, 38(3-4), 183–197. [https://doi.org/10.1016/s0169-2046\(97\)00033-9](https://doi.org/10.1016/s0169-2046(97)00033-9)

Design Implications for Three Little Bakers Revitalization

- Economic benefits: Naturalistic golf courses can attract visitors and generate revenue for local communities, while also providing environmental and social benefits.
- Improved water quality: Naturalistic golf courses can help improve water quality by reducing runoff, promoting filtration, and providing habitat for aquatic species.
- Incorporate native plant species
- Allowing for naturalization of rough areas.
- Designing with consideration for wildlife habitat and corridors.



Sustainable Reclamation in Golf Course Design

Summary Paragraph/Abstract

- The article discusses sustainable practices in designing and reclaiming golf courses. It emphasizes the importance of environmental consciousness and using natural features to enhance the golfing experience. The article suggests using local plant species, controlling erosion, and minimizing water usage to promote sustainability.

Major Points/Topics

- Sustainable reclamation can involve various techniques, such as soil stabilization, erosion control, wetland restoration, native plantings, water management, and wildlife habitat enhancement.
- Sustainable reclamation can provide multiple benefits, such as reducing erosion and sedimentation, improving water quality and quantity, enhancing biodiversity, providing recreational opportunities, and supporting local economies.

Author: Justin Meranda

Source: Meranda, J. A. (1970, January 1). Sustainable reclamation in golf course design. Cardinal Scholar Home. Retrieved February 10, 2023, from <https://cardinalscholar.bsu.edu/handle/handle/189118>

Design Implications for Three Little Bakers Revitalization

- Create buffer zones or other protective measures to protect water resources or environmentally sensitive areas.
- Work with the natural topography of the land and utilize natural landforms and features to minimize the amount of grading required.
- Design should incorporate Integrated Plant Management and resource consideration strategies that are environmentally responsible, efficient, and cost effective.



Golf course architecture: Evolutions in design, construction, and Restoration Technology

Summary Paragraph/Abstract

- This book discusses the changes and developments in the field of golf course design, construction, and restoration. The author provides examples of famous golf courses that have undergone transformations to fit modern standards. For instance, the renovation of Pebble Beach Golf Links involved redesigning bunkers, improving irrigation, and creating new tees.

Major Points/Topics

- Golf has evolved over time, and courses need to evolve with the new changes in technology
- Routing, grading, and drainage techniques can be used to make a challenging yet playable course
- Environmental sustainability is extremely important in golf course design and construction. The author discusses strategies for reducing water usage, minimizing pesticide use, and preserving natural habitats.



Author: Michael Hurdzan

Source: Hurdzan, M. J. (2006). Golf course architecture: Evolutions in design, construction, and Restoration Technology. J. Wiley & Sons.

Design Implications for Three Little Bakers Revitalization

- The use of sustainable practices such as natural drainage, native vegetation, and recycled materials can help reduce the environmental impact.
- The design of the course should take advantage of the natural features of the site, such as hills, valleys, and waterways.
- The design should incorporate a variety of hazards, such as bunkers, water hazards, and rough, to create strategic opportunities for golfers.

Golf Course Management and Construction: Environmental issues

Summary Paragraph/Abstract

- This book provides an overview of the environmental challenges associated with golf course management and construction. The book covers a wide range of topics, including site selection and preparation, soil management, water management, pesticide and fertilizer use, and wildlife management.

Major Points/Topics

- Golf courses have the potential to cause significant environmental damage, including soil erosion, water pollution, habitat destruction, and disruption of wildlife populations.
- There are a variety of strategies that can be employed to minimize the environmental impact of golf courses, including the use of sustainable design practices, implementing water conservation measures, and creating habitats for wildlife.
- Implementing energy-efficient practices and using alternative energy sources can help reduce energy consumption and environmental impact.



Author: James Balogh & Will Walker

Source: Balogh, J. C., & Walker, W. J. (1992). Golf Course Management and Construction: Environmental issues. Lewis.

Design Implications for Three Little Bakers Revitalization

- Preserving existing trees and vegetation, minimizing earthmoving, and designing holes that follow the natural contours of the land.
- consider the needs of local wildlife when designing the course and incorporate habitat features such as wetlands and nesting boxes.
- minimize chemical use by selecting grass varieties that are resistant to pests and diseases and by incorporating natural pest control measures such as biological controls.

An Environmental Frame of Reference: Golf Course Design in Out-Of-Play Areas

Summary Paragraph/Abstract

- This article discusses the importance of considering environmental factors in the design and maintenance of golf courses, particularly in the out-of-play areas. The author argues that golf course designers should take a more holistic approach that incorporates environmental concerns, such as the impact of chemicals on wildlife and the use of water resources.

Major Points/Topics

- Ecological considerations include: soil quality, vegetation, and wildlife habitat
- Use of native plants and natural features to enhance the landscape.
- Golf courses should aim to create a welcoming and inclusive environment that is accessible to all members of the community



Author: David Kiss

Source: Kiss, D. J. (1998, April 27). An environmental frame of reference: Golf course design in out-of-play areas. VTechWorks Home. Retrieved February 23, 2023, from <https://vtechworks.lib.vt.edu/handle/10919/36683>

Design Implications for Three Little Bakers Revitalization

- Design to limit erosion and flooding.
- Opportunity to create wildflower meadows in out-of-play areas to benefit pollinators
- More naturalistic style/ wild style designs providing transition from designs course to surrounding vegetation benefit wildlife.

Ups and downs par for the course for golf industry

Summary Paragraph/Abstract

- There has been an increase in golf course memberships and rounds played, particularly during the COVID-19 pandemic as people looked for outdoor recreational activities that allowed for social distancing. Additionally, golf equipment sales have been strong, driven in part by the popularity of online shopping. However, the industry has also faced challenges, including a decline in the number of golf courses and a decrease in interest from younger generations. Many golf courses have struggled financially, and some have been forced to close or sell off land for development.

Major Points/Topics

- Golf courses are struggling to stay afloat due to declining revenue
- Some courses are finding success by adapting to the demographics

Author: Jim Finnegan

Source: Finnegan, J (2020, February 9). Ups and downs par for the course for Golf Industry. Delaware Business Times. Retrieved February 23, 2023, from <https://delawarebusinesstimes.com/news/commercial-real-estate/continued-ups-downs-golf-industry-par-course/>

Design Implications for Three Little Bakers Revitalization

- Adapt to consumers by providing other recreational opportunities (frisbee, greenspace, disc golf)
- Make course inclusive to all ages and skill levels
- Provide educational opportunities

Why do Golf Courses Close and What Happens then?

Summary Paragraph/Abstract

- Golf courses close for many reasons such as declining membership, financial struggles, competition from other courses, and changes in local demographics. When a golf course shuts down, the property may be repurposed for other uses, such as residential or commercial development, or it may be converted into a public park or green space. The process of repurposing a closed golf course can be complicated and may involve zoning changes, environmental assessments, and community input. Additionally, the closure of a golf course can have ripple effects on the local economy, including the loss of jobs and tax revenue.

Major Points/Topics

- Closed courses have a direct effect on the surrounding community
- Many closed courses throughout the US have no plans for development
- There are many challenges to repurposing a golf course including zoning regulation and environmental concerns



Author: Larry Hirsh

Source: Hirsh, L ; Why do golf courses close and what happens then? Golf Property Analysts. (2018, November 30). Retrieved February 23, 2023, from <https://golfprop.com/blog/why-do-golf-courses-close-and-what-happens-then/>

Design Implications for Three Little Bakers Revitalization

- Create a design the community agrees with
- Make sure there is enough demand for a course in the area
- provide amenities other than just 18-holes of golf.

Expansion of golf courses in the United States

Summary Paragraph/Abstract

- Twenty-five million Americans play golf on the nation's 16,000 courses each year. These golf courses constitute a significant national landscape feature. Several factors have contributed to this growth, including rising incomes, increased leisure time, and a growing interest in outdoor recreation. Golf courses can have significant ecological effects, including changes to the hydrology of surrounding areas, loss of natural habitats, and increased use of pesticides and fertilizers.

Major Points/Topics

- Golf is no longer a leisure activity for just wealthy individuals
- There has been a major influx of golfers in recent years
- 33.5 million people played a round of golf in America in 2018
- With this increase in players and courses there is need for adaptation to help better benefit the natural environment by limiting carbon footprint
- Places where many retirees are located have a higher rate of golfers
- Some courses are finding success by adapting to the demographics

Authors: Darrell Napton & Christopher Laingen

Source: Napton, D. E., & Laingen, C. R. (2008). Expansion of golf courses in the United States. *The Geographical Review*, 98(1), 24+. https://link.gale.com/apps/doc/A175165599/ITOF?u=udel_main&sid=bookmark-ITOF&xid=b81d2b13

Design Implications for Three Little Bakers Revitalization

- Use sustainable design practices
- 9 hole course can be more effective in limiting carbon footprint
- Target people who are retired, and be inclusive to everyone in the area
- Adapt to consumers by providing other recreational opportunities (frisbee, greenspace, disc golf)

San Geronimo National Golf Course in West Marin County, California, was a former 18-hole public course built in the floodplain of San Geronimo Creek. The creek is a major tributary to Lagunitas Creek, a stream that travels from east to west through protected open space—hillsides of oaks and California laurel, Douglas fir and redwood forests—into Tomales Bay on the coast. In 2017, it was purchased by the trust for public land and transformed into a Conservation Project.

- Restored 1,700 ft of Geronimo Creek, and designed a natural channel with pools and riffles to help salmon.
- Restored riparian buffer and enhanced the floodplain
- Created wetland to store high flows of water
- Planted more native trees and vegetation and restored ephemeral drainages to create connectivity between the former course and the four open-space parcels surrounding the property
- Reconnected the creeks to their floodplains, bringing moisture and water back to the land to help build in resilience

Design Implications for Three Little Bakers Revitalization

- Similar restoration opportunity of Pike Creek, flowing along 6 holes of the golf course
- Similar restoration can be done to wetlands of Three Little Bakers golf course
- Replanting can be done to help naturalize the course

135 Acres Naturalistic/Wild Design

Users: Hikers, Bikers, Horseback Riders



Built by architect Gil Hanse as the host course for the 2016 Olympic games held in Brazil, this golf course is a great example of how architects can design a championship caliber venue while also preserving and creating large amounts of wildlife habitat. Some of the statistical measures of this courses ecological success include:

- Transplanting 15,000 species of vegetation and wildlife, which restored 81 acres of habitat.
- Re-naturalizing habitat which led to the increase of fauna species from 118 to 263.
- Sourcing 90% of the material used in construction from within 250 miles of the site
- Creating 3 environmental education centers in association with the course.
- The course was created as a portion of a larger master plan for Rio de Janeiro focused on sustainability. Before construction, over 80% of the project area was degraded sand mining land.

Design Implications for Three Little Bakers Revitalization

- Can connect ecologically sustainable designs with wildlife corridor surrounding the course
- Limit major construction by utilizing topography and slopes in design
- Education centers can be created along with clubhouse

239 Acres Users: Golfers/Public

167% increase in native vegetation



In Florida, Sanford Ferris Golf Course Design reduced an 18-hole footprint at the Sailfish Sands Golf Course by changing it to a nine-hole reversible course, which lowered chemical and fertilizer use and mowing by 40 percent according to David Ferris Jr., ASLA, a partner at the firm. In addition, the trend toward shorter games lends itself to shorter courses, reducing the carbon footprint of the greens. By reducing managed turf the course became harder but had a more positive effect on water use and pesticide use.

- Increased natural areas on property by reducing the footprint of the course benefitting the wildlife of the area
- Redesigned their practice range to a modern entertainment venue to increase the users

Design Implications for Three Little Bakers Revitalization

- Potential for a similar design to limit the footprint of the course and provide conservation area
- Provide a modern twist on the history of the course and the club house



95 Acres Users: Golfer, Public
 Sandbelt/Links Naturalistic Design

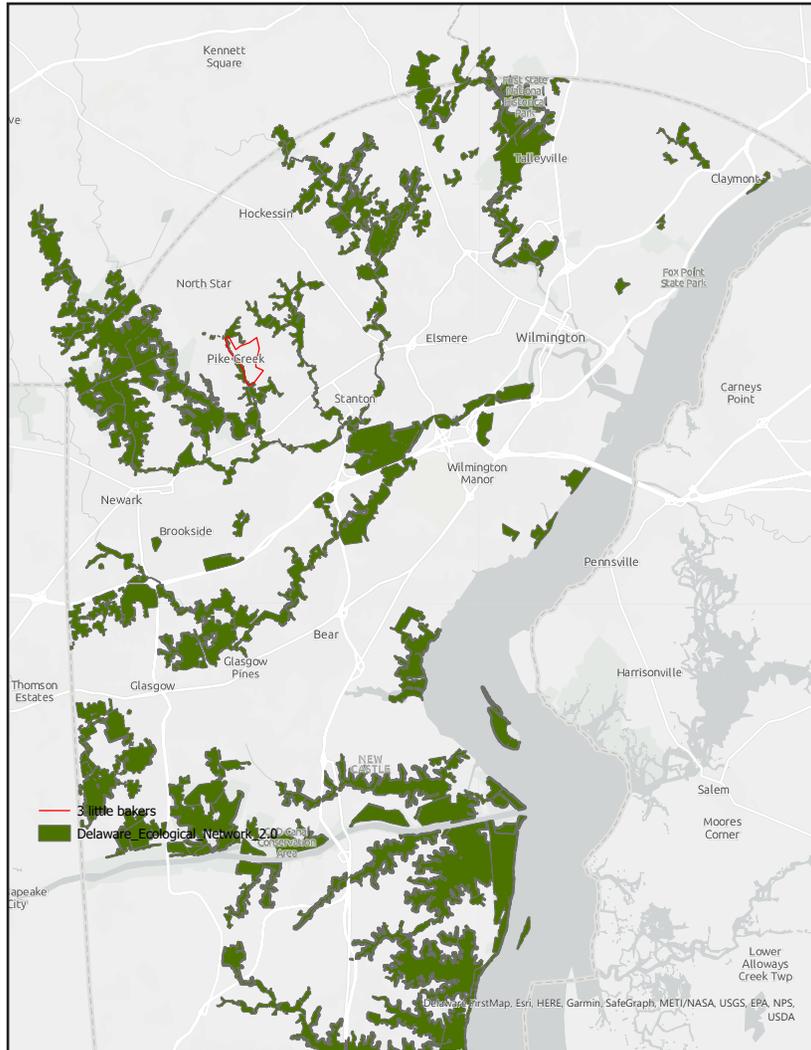




Inventory & Analysis

GIS Mappings

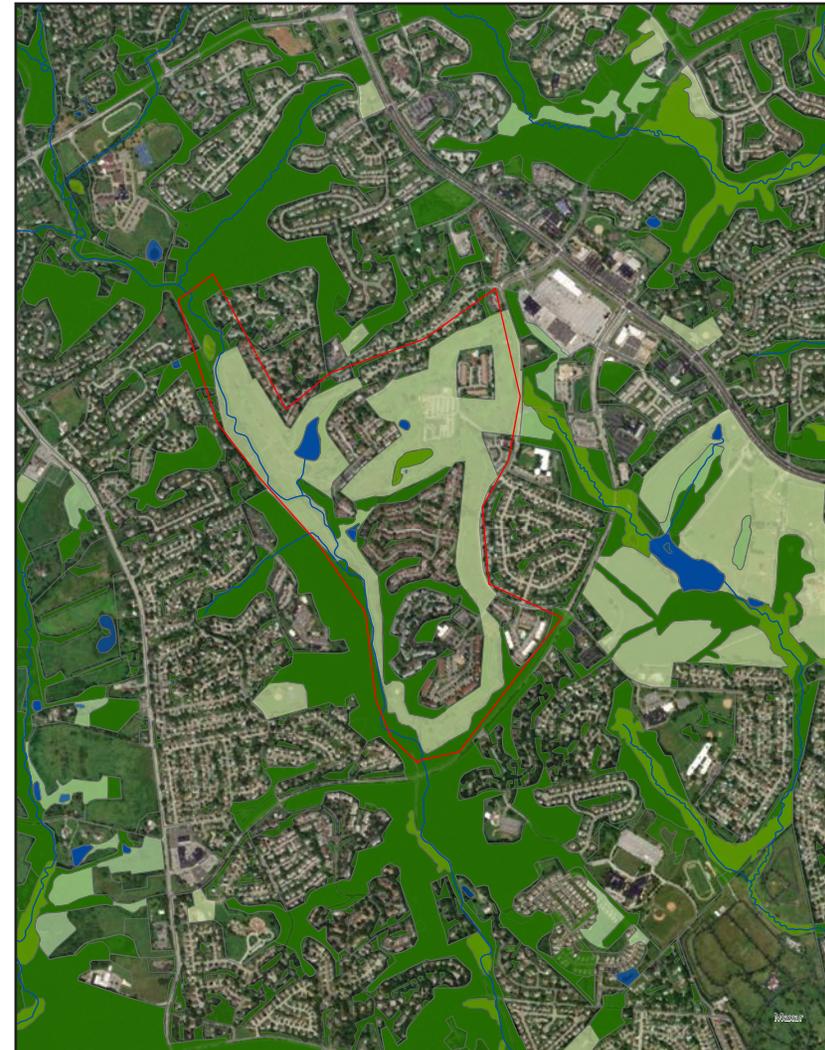
Ecological Network



- Ecological Corridor
- Site Boundary



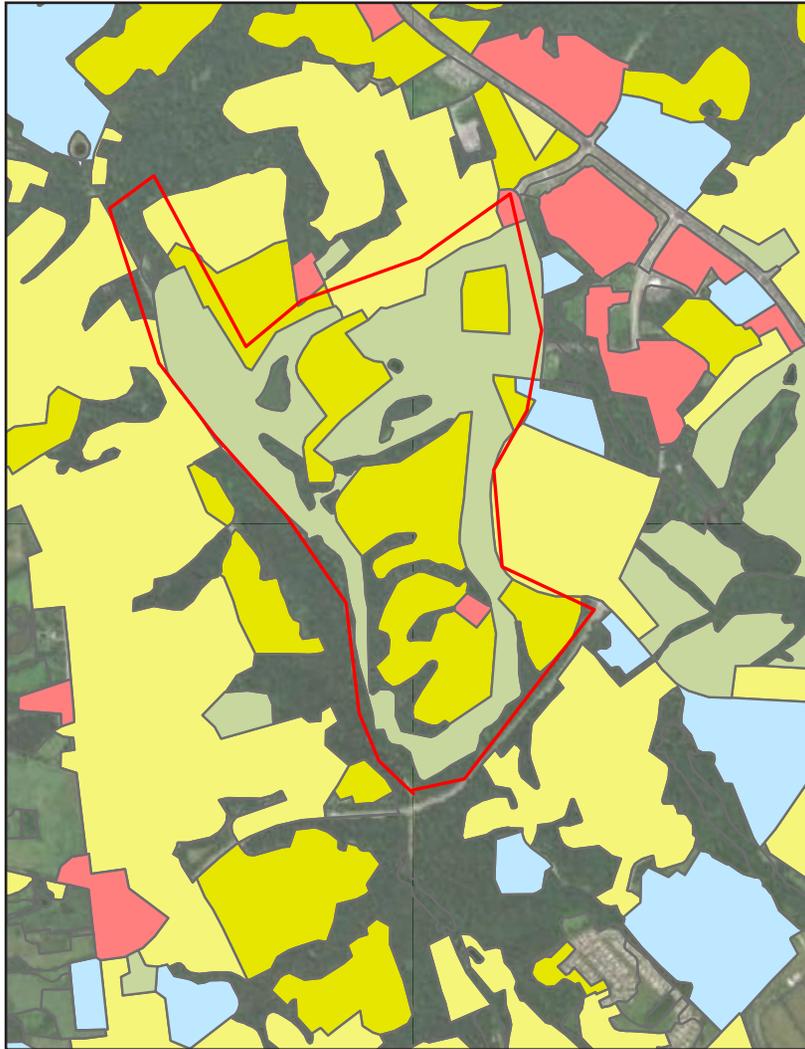
Habitat



- Deciduous Forest
- Water
- Wetlands
- Rangeland
- Site Boundary



Development



- Single-Family Housing
- Multi-Family Housing
- Schools/Governmental
- Recreational
- Retail/Commercial



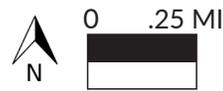
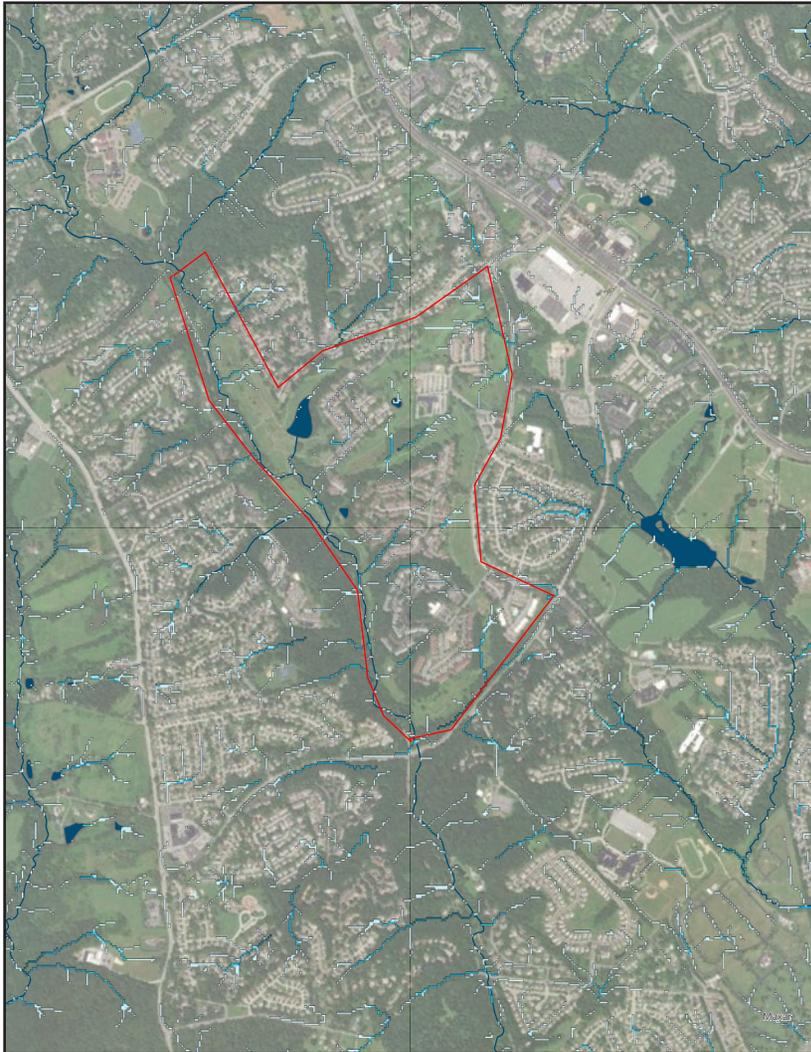
Topography



- 10' Contours
- Flat
- Steep



Hydrology



Ecological Network:

- 3LB is located along the greater Delaware Ecological Network. Unfortunately the development on this property has disconnected this part of the corridor.
- Wetlands, Meadows, Grassland, Rangeland, and a major river system make up this property. Providing excellent opportunity for biodiversity
- The abandoned golf course was part of a greater development plan consisting of 3 apartment developments overlooking the course as well as adjacent neighborhoods. There are also two schools adjacent to the property and a popular park.
- The property has many slopes and the elevation changes dramatically on certain holes. The lowest elevated part of the property is the creek and the eastern side of the property
- The water mostly accumulates along the south western part of the property, and the wetlands throughout

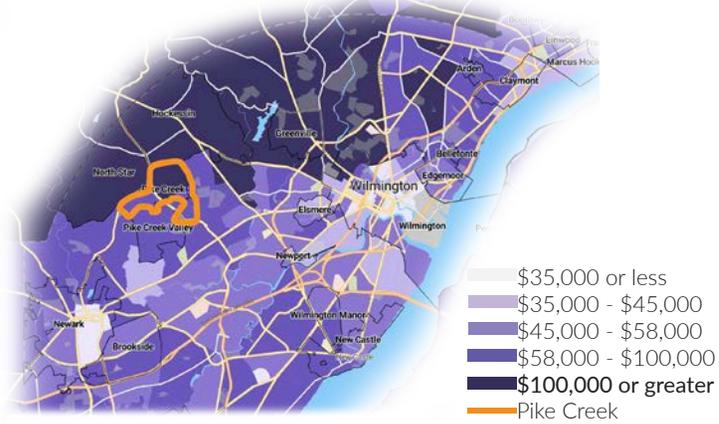
Demographic Analysis

Pike Creek has had an 18% increase in people aged 45-54 since 2017, averages a median income of \$100,000 or greater, is made up of 15% of people aged 45-54, and 63% of residents are college grads which fits directly into the demographics for the average golfer in the United States.

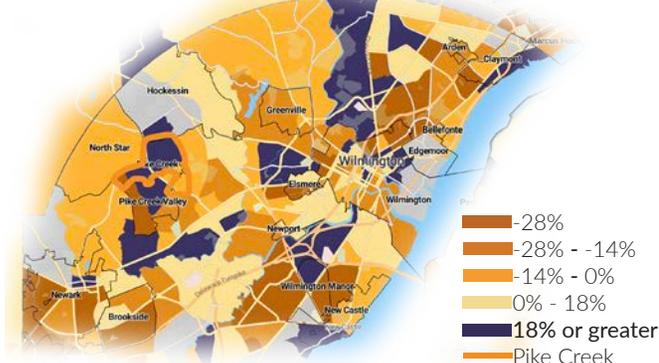
The Average Golfer

- 77% Males
- Average age: 54
- Average Income: 100K
- 67% College grads

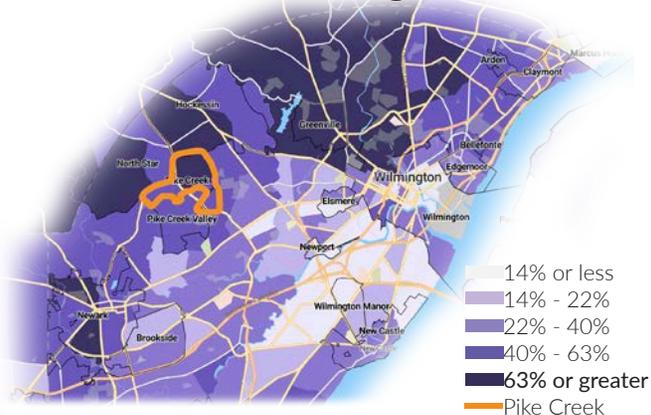
Median Income



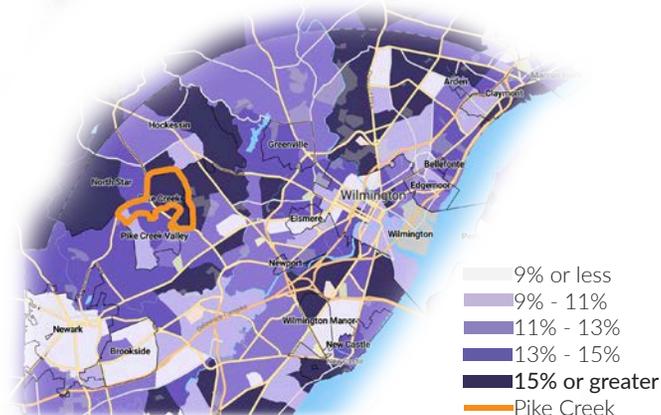
Percent change in people age 45-54 since 2017



Percent of College Grads



Percent of people age 45-54



Site Scale Analysis & Inventory

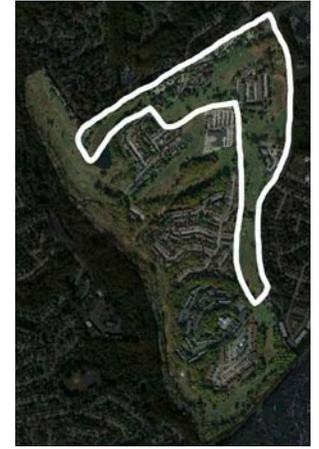


Three Little Bakers Golf Course can be broken down into 3 main sites:

- **Site 1** is the Upland Flatland, which is the area of the course with the highest elevation. Relatively flat, this area of the course has major stormwater management basins as well as a meadow that has developed in recent years.
- **Site 2** is the Sloped Valley, consisting of major topographic changes and dense buffers of trees and shrubs on both sides of the abandoned course. Adjacent to this stretch of course is a popular roadside bike trail and Pike Creek.
- **Site 3** is the Dense Forest and Grassland, consisting of flat meadow areas with grasses nearly 10' in height. This site has areas of land with the lowest elevation on the site and is adjacent to pike creek as well as two of the housing developments.

- Schools
- Medical Center
- Old Clubhouse/Facilities
- Hydrology
- Stormwater Management
- Cart Path
- Meadow/Wild Grassland
- Forest
- Disconnected Cart Path
- Connection Opportunity

Site 1 - Upland Flatland

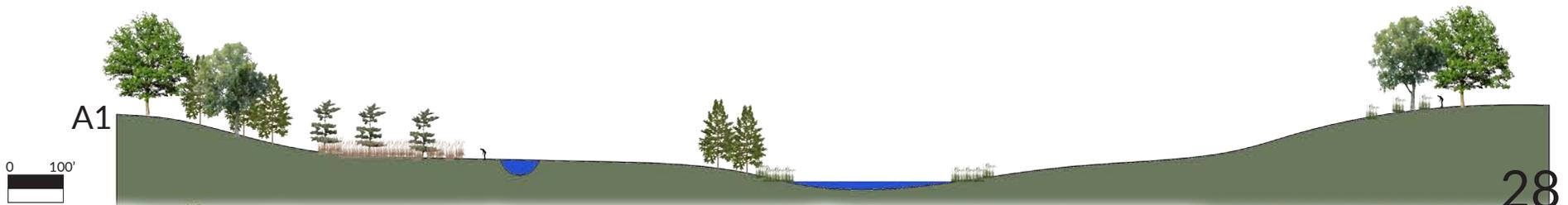


Inventory

- Creek along cart path
- Cart path destroyed and culvert exposed
- Tee box trimmed and mowed as well as fairways
- Blue stem and loblolly pine growing abundantly in old bunkers
- Cart path destroyed and creek exposed
- Geese abundant
- Extreme slopes down from tee boxes
- Slopes incline away from clubhouse
- Bunker full of giant goldenrod
- Wide open fairway after “fairway falls” development
- Major topo drop in center of fairway
- Wild rye and trees in bunkers
- Dense woody and shrub buffer between southern development and fairways
- Flat across second road then major drop off

Plant list

- | | |
|-----------------------|-------------------------|
| Lonicera morrowii | Quercus rubra |
| Quercus Alba | Picea pungens |
| Pinus taeda | Fagus grandifolia |
| Pinus strobus | Liquidambar styraciflua |
| Wild bergamot | Fagus grandifolia |
| Andropogon virginicus | Acer rubrum |
| Rubus phoenicolasius | Solidago gigantea |
| Thuja occidentalis | Rubus phoenicolasius |
| Cornus sericea | Paulownia tomentosa |
| Pyrus calleryana | Wild rye |
| Magnolia Soulangeana | Frangula alnus |
| Ulmus thomasii | Pinus virginiana |



Site 2 - Sloped Valley



Inventory

- Woody buffer between street and course
- “Bowl” feel with slopes coming down from apartment buildings
- Exposed culvert at 13th tee box
- Hilly fairway sloping down from apartments
- Major drop-off from fairway to creek to roadway
- Walking trail along roadway (connection opportunity)
- Transitions from mowed course to overgrown wild grassland surrounding by dense woodland
- Transitions from grassland to woodland
- Topo slopes down from housing to path to creek and back up to the road
- No buffer from creek to path
- Path overgrown and not very well maintained
- Flat compared to rest of course

Plant list

Platanus occidentalis

Juniperus virginiana

Picea abies

Arctium minus

Solidago gigantea takes up the old fairways



Site 3 - Dense Forest and Grassland



Inventory

- Flat dense grassland/ meadow
- Creek cuts across
- Stillwater looks contaminated
- Extremely tranquil
- Creek now in between houses and fairway
- Path overgrown
- As creek cuts back across transitions to mowed and maintained grass
- Smaller stormwater creek between apartments and course
- Hilly grassland

Plant list

Pinus taeda
Pinus strobus
Andropogon virginicus
Rubus phoenicolasius
Thuja occidentalis
Solidago gigantea
Pinus virginiana





Design Development



MASTER PLAN

The Resurgence & Revival at 3 Little Bakers Golf Course Master plan consists of a 9-Hole Golf Course and facilities, a community park, and an enhanced ecological corridor along Pike Creek. The Golf Course traverses the existing corridors created for the original course, and is reversible to allow for a new experience each time it is played. The community park provides much needed programming and amenities for the surrounding schools and housing developments. The ecological corridor enhances the buffer between the old course and pike creek as well as the abundance of native trees and shrubs to provide a connection to the greater Ecological Corridor of Delaware that was disconnected with the construction of the original course.

9 HOLE REVERSIBLE GOLF COURSE

-  Fairways(bent grass)
-  Tee box(bent grass)
-  Greens(bent grass)
-  Bunkers
-  Naturalistic out of play areas
-  Water/Wetlands
-  Buffer Strips
-  Course boundary

- | | |
|---------------|---------------|
| Hole 1: PAR 3 | Hole 1: PAR 5 |
| Hole 2: PAR 4 | Hole 2: PAR 3 |
| Hole 3: PAR 4 | Hole 3: PAR 5 |
| Hole 4: PAR 4 | Hole 4: PAR 4 |
| Hole 5: PAR 4 | Hole 5: PAR 4 |
| Hole 6: PAR 4 | Hole 6: PAR 4 |
| Hole 7: PAR 5 | Hole 7: PAR 4 |
| Hole 8: PAR 3 | Hole 8: PAR 4 |
| Hole 9: PAR 5 | Hole 9: PAR 3 |

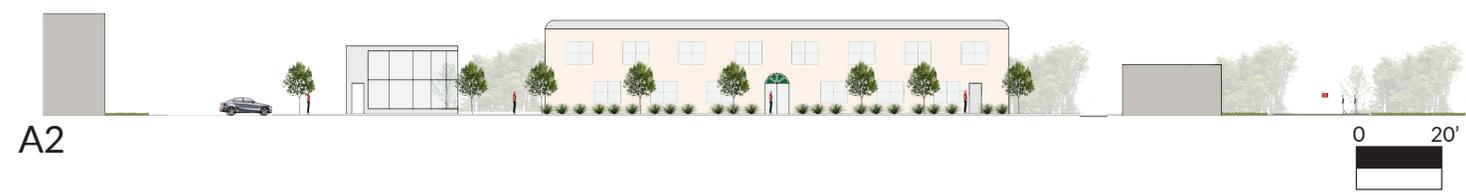
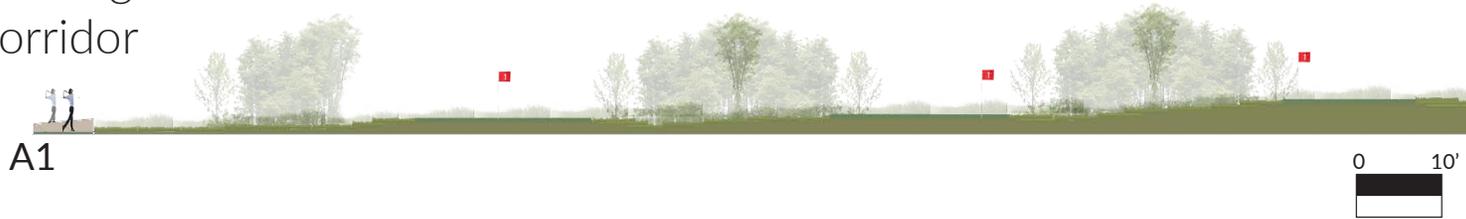


Buffer Strips, Naturalistic/Pollinator friendly out-of-play areas, and a limit on pesticide use make this course environmentally friendly and limits non-point source pollution.

- Reversible 9-hole course
- Stormwater management enhancements
- Cart path enhancements
- New bunkers
- New course orientation
- Bent grass greens
- Zoysia grass fairways and teeboxes
- Sloping hilly fairways leading to elevated or sunken greens
- Out of play areas consisting of wildflower meadows, grassland, wetlands, creating connection to larger ecological corridor

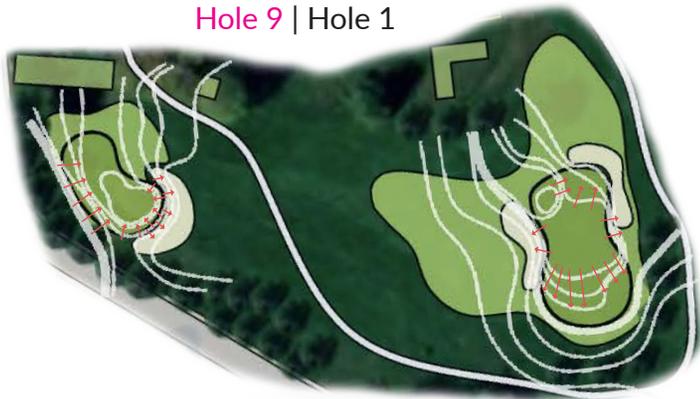


HOLE	1	2	3	4	5	6	7	8	9	IN
Blue	191	410	375	343	405	440	520	181	505	3370
White	178	395	355	329	390	425	475	165	480	3192
Red	130	295	280	265	300	290	410	140	375	2485
Par	3	4	4	4	4	4	5	3	5	36



Featured Holes

Hole 9 | Hole 1



Hole 1 | Hole 9



ECOLOGICAL CORRIDOR

- Meadow/grassland
- wildflower/pollinator beneficial plants
- Bird habitat and sanctuary
- River improval/enhancement
- Buffer
- Replanting of woody vegetation
- Wetland habitat development
- Improve stormwater capabilities
- Protect habitats on southern side
- Invasive removal, and native replanting

Lookout View



Corridor View



Plant Palette (replanting)

Betula nigra



Andropogon virginicus



Kalmia Latifolia



Solidago gigantea



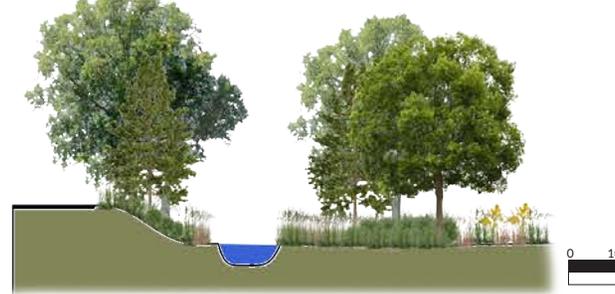
Vaccinium corymbosum



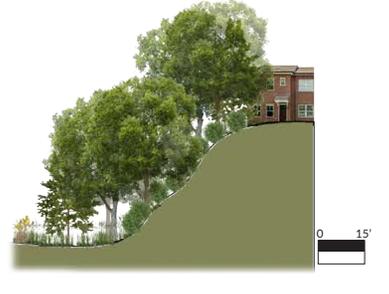
Pinus strobus



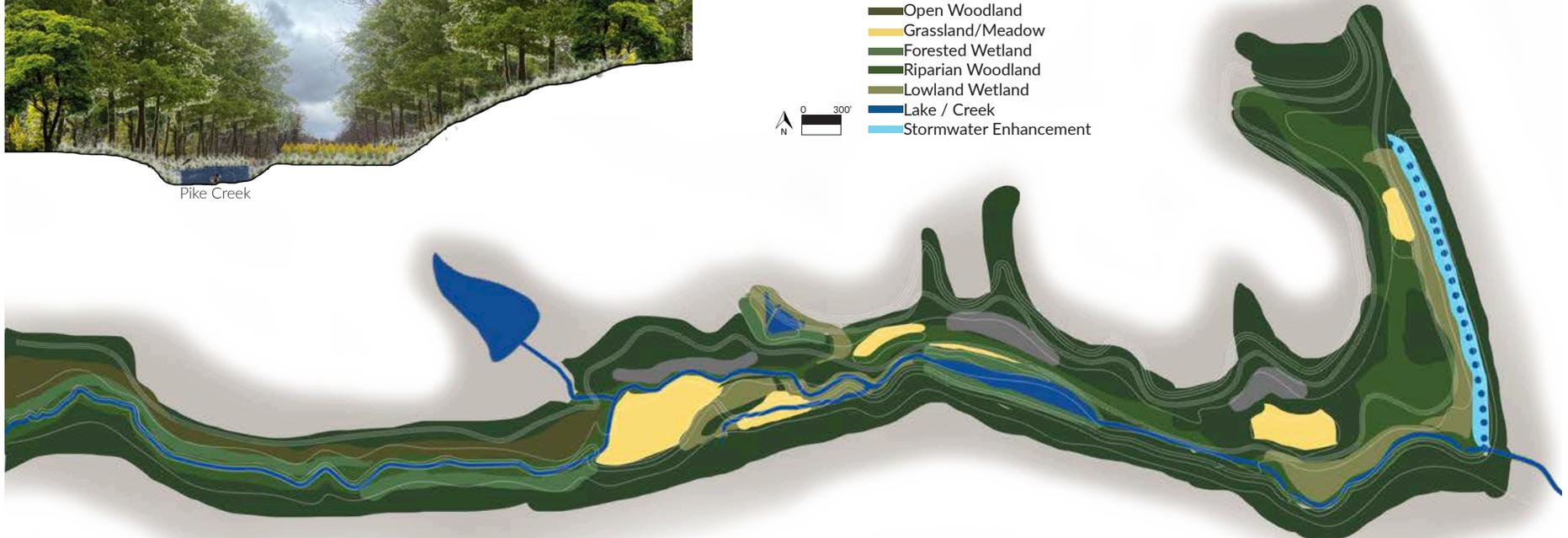
Western Buffer



Eastern Buffer



- Deciduous Forest / Buffer
- Rocky Outcrop
- Open Woodland
- Grassland/Meadow
- Forested Wetland
- Riparian Woodland
- Lowland Wetland
- Lake / Creek
- Stormwater Enhancement



Focal Species



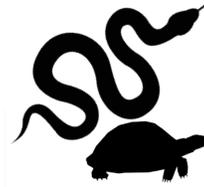
- Largemouth Bass
- Bluegill



- Common eastern bumblebee
- Western Honeybee



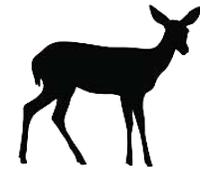
- Eastern redback salamander
- American Toad
- Pickerel Frog



- Common box turtle
- Northern redbellied cooter
- Eastern Rat snake
- Dekay's brown snake

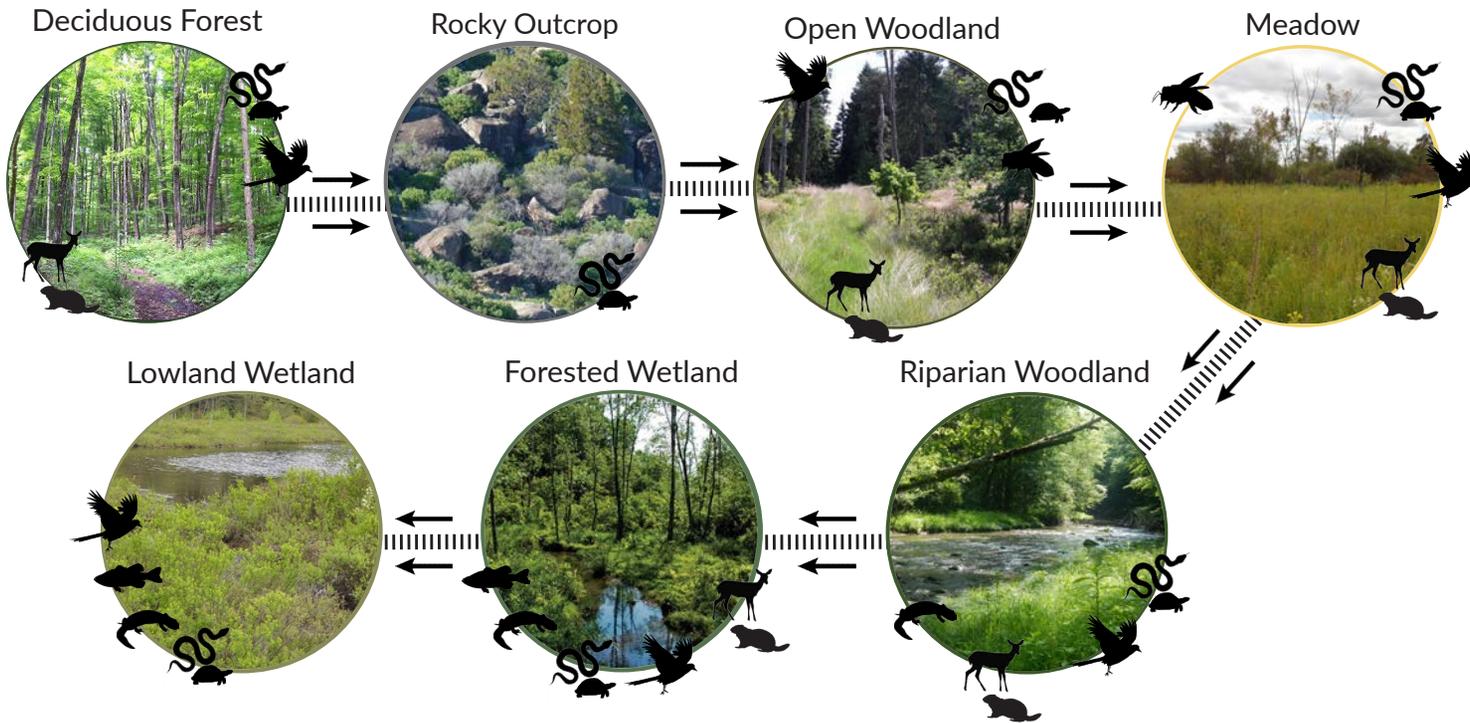


- Cooper's Hawk
- Bald Eagle
- Great blue Heron
- Mallard



- White-tailed deer
- Red fox
- Groundhog
- American Beaver

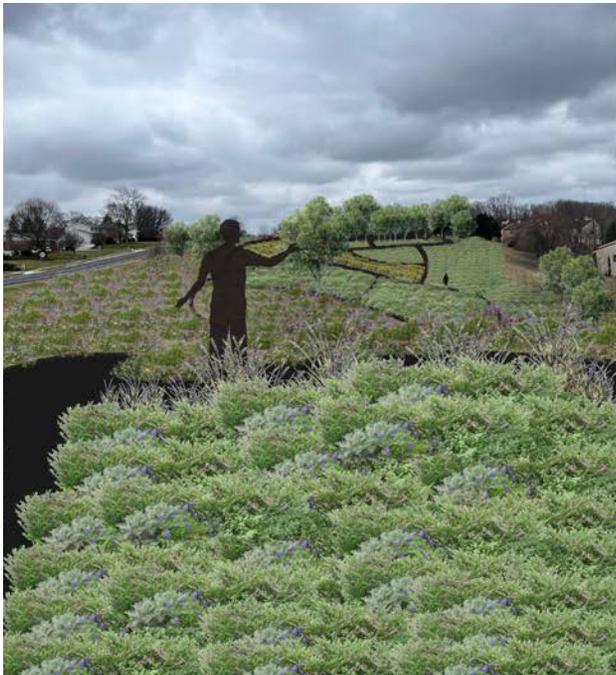
Habitats



COMMUNITY PARK

- Walking and biking trails
- Educational signage
- Look out / nodes
- Open fields
- Opportunity for sport events
- Open greens for relaxing, picnicking
- Disc golf
- Pickleballs
- Tennis courts
- Playground

Meadow View





References

- Cederberg, K (2017) Taking golf out of golf course: Trajectories to convert facilities to ... (n.d.). Retrieved February 12, 2023, from <http://thecela.me/wp-content/uploads/214F.pdf>
- Terman, M. R. (1997). Natural links: Naturalistic golf courses as wildlife habitat. *Landscape and Urban Planning*, 38(3-4), 183–197. [https://doi.org/10.1016/s0169-2046\(97\)00033-9](https://doi.org/10.1016/s0169-2046(97)00033-9)
- Meranda, J. A. (1970, January 1). Sustainable reclamation in golf course design. Cardinal Scholar Home. Retrieved February 10, 2023, from <https://cardinalscholar.bsu.edu/handle/handle/189118>
- Hurdzan, M. J. (2006). *Golf course architecture: Evolutions in design, construction, and Restoration Technology*. J. Wiley & Sons.
- Balogh, J. C., & Walker, W. J. (1992). *Golf Course Management and Construction: Environmental issues*. Lewis.
- An Environmental Frame of Reference: Golf Course Design in Out-Of-Play Areas Kiss, D. J. (1998, April 27). An environmental frame of reference: Golf course design in out-of-play areas. VTechWorks Home. Retrieved February 23, 2023, from <https://vtechworks.lib.vt.edu/handle/10919/36683>
- Editorial. (2020, February 9). Ups and downs par for the course for Golf Industry. Delaware Business Times. Retrieved February 23, 2023, from <https://delawarebusinesstimes.com/news/commercial-real-estate/continued-ups-downs-golf-industry-par-course/>
- Why do golf courses close and what happens then?. Golf Property Analysts. (2018, November 30). <https://golf-prop.com/blog/why-do-golf-courses-close-and-what-happens-then/>
- ACSP for golf. Audubon International. (2023, April 4). <https://auduboninternational.org/acsp-for-golf/>
- Wilson, X. W. and X. (2017a, November 5). County at crossroads in Three little bakers golf course lawsuit and Development Effort. The News Journal. <https://www.delawareonline.com/story/news/2017/11/04/county-crossroads-three-little-bakers-golf-course-lawsuit-and-development-effort/821113001/>