

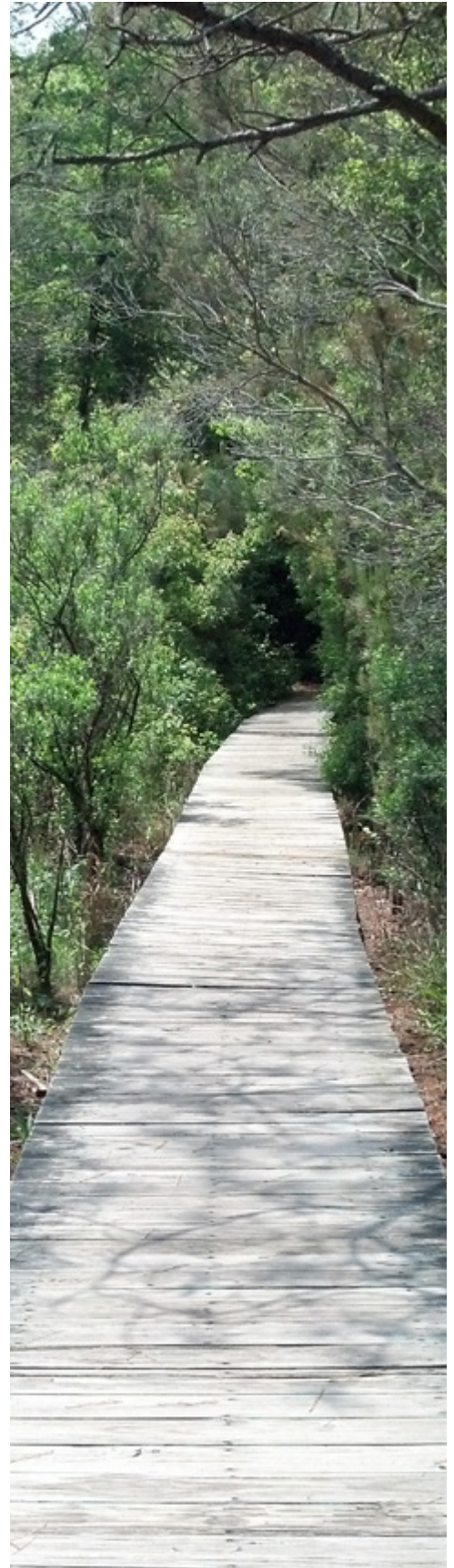
JAMES FARM ECOLOGICAL PRESERVE

Master Plan Report

Prepared for:



Prepared by:



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INTRODUCTION

James Farm Ecological Preserve

James Farm Ecological Preserve (Preserve) is a 150-acre bayside ecological preserve, located between Joshua Cove and Pasture Point Cove on the Indian River Bay, in Ocean View, Delaware. The Preserve boasts a diverse mix of upland fields, freshwater wetlands, mixed hardwood and pine forest, salt marsh, and a sandy beach and saltwater cove. The Preserve is representative of all the ecotypes present on the Delmarva Peninsula. It had previously been a farmed property, owned by the James Family. The management of the Preserve includes restoration projects focused on reforestation, wetland creation, aquatic restoration and salt marsh restoration. These include salt marsh, overwash dune grassland, loblolly pine/ wax myrtle woodland, southern red oak/ heath forest, successional maritime forest, palustrine forested wetland, as well as some areas that are more representative of the conversion of formerly developed or manipulated (agricultural) landscapes including: successional forest lands, warm season meadow, as well as cultivated turf grass and native landscape gardens near the existing Preserve structures and entry area.

The Preserve serves as an important resource for the Delaware Center for the Inland Bays (CIB) by providing both a location for education about the Bays and a regionally important natural preserve on the Inland Bays and, in that, the Preserve deserves special status not only in terms of the need to preserve such communities but also to make accessible and interpret them to the general public, especially for students. Education about the environment, specifically the Inland Bays, happens at the Preserve both formally and informally and any improvements to the property should occur with this in mind. Ecological resources are to be protected, enhanced, and restored to not only improve the condition and function of the property but to also demonstrate and highlight the importance of the various ecological functions that occur at the Preserve and how they play in the greater Inland Bays region.



A young man holds a horseshoe crab at the Preserve's beach

Delaware Center for the Inland Bays

The Preserve is managed by the CIB in Rehoboth Beach, Delaware, for the purposes of environmental preservation, education, and recreation. Established in 1994, the CIB is a non-profit organization.

With its many partners, the CIB conducts public outreach and education, develops and implements restoration projects, encourages scientific inquiry, and sponsors research. According to The James Farm Ecological Preserve Management Plan (See The James Farm Ecological Preserve Management Plan section below for more information), which was prepared in 2008 and updated in 2012, the following are the mission and goals of the CIB. The mission of the CIB is to promote the wise use and enhancement of the Inland Bays and their watersheds.

The James Farm Ecological Preserve Management Plan (2008, updated 2012)

The James Farm Ecological Preserve Management Plan (Management Plan) was developed in 2008 and updated on September 28, 2012. Created to help guide the management and future of the Preserve, the Management Plan reflects: 1) the continued renewal of support from Sussex County Council to the Delaware Center for the Inland Bays in operating the Preserve, 2) adjustments to the original goals and objectives to reaffirm the correct approach for the CIB's continued involvement, and 3) the continuing partnership with Indian River School District in sponsoring education programs at the Preserve. It reaffirms and extends the earlier aims and objectives of the CIB in holding this resource for teaching, restoration, and research and also as a service to the community.

The four main goals of the CIB are:

1. To sponsor and support educational activities, restoration efforts, and land acquisition programs that lead to the present and future preservation and enhancement of the Inland Bays watershed."
2. To build, maintain, and foster the partnership among the general public; the private sector; and local, state, and federal governments, which is essential for establishing and sustaining policy, programs, and the political will to preserve and restore the resources of the Inland Bays watershed."
3. To serve as a neutral forum where Inland Bays watershed issues may be analyzed and considered for the purposes of providing responsible officials and the public with a basis for making informed decisions concerning the management of the resources of the Inland Bays watershed."
4. The establishment of the Delaware Center for the Inland Bays was the culmination of more than 20 years of active public participation and investigation into the decline of the Inland Bays and the remedies for the restoration and preservation of the watershed."

The Management Plan focuses on managing the Preserve's natural habitats. The management of a large and exceptional natural environment so near to a major resort area and numerous clusters of housing developments is an unusual situation. Similar areas are most often developed rather than preserved. If the habitats of the Inland Bays' ecosystem at the Preserve are seriously degraded or altered, the associated value to nature and ecosystems services that we rely on could be compromised and difficult to replace.

The management vision for the Preserve is to provide stewardship to protect and nurture this land as a public trust where the natural environment is preserved and explained through unique educational signage and programming, and increased visitation is accommodated within the reasonable opportunities and constraints of the site. This will be accomplished under a plan that uses resources that are anticipated and garnered in advance of plan implementation.

The Management Plan did not anticipate increased visitation nor address adding and replacement of facilities. Existing facilities at the Preserve in subsequent years were often added piecemeal without an overall site plan or vision.

James Farm Ecological Preserve Master Plan (2014)

Purpose/Key Objectives

The CIB recognized that a more coherent and comprehensive plan was needed than The James Farm Ecological Preserve Management Plan of 2008/2012 to address not only increased visitation but also the growing education and environmental outreach programs. Overall visitation at the Preserve has grown dramatically due to population increase and a regionally increased demand for outdoor recreation. Sussex County's population increased by 35% from 148,897 in 1998 to 200,330 in 2011; and is projected to increase another 35% to 271,326 people by 2030 according to projections by CIB. An estimated 10,001 visits were made to the Farm in 2012. The comparable Holts Landing State Park, also located on Indian River Bay, received an estimated 6,448 visits in 2011. Visitation continues to grow as residents and visitors seek recreational alternatives to overcrowded ocean beaches that have evolved inhospitable shorelines due to beach replenishment. During the peak of the summer season 75 individuals may now be found at the James Farm beach on the Indian River Bay. Other important emerging issues such as climate change on sea level and the planned replacement of facilities would need to be addressed in a new, comprehensive 2014 Master Plan for the Preserve—James Farm Ecological Preserve Master Plan (Master Plan).

Aside from the need to address continued increasing visitation, the 2014 Master Plan fundamentally focuses on the physical restoration, improvement, and management of the property and a strategic plan is recommended to be developed by the CIB to identify and plan for public education. To that end, this report recommends educational interpretive opportunities that exist at the Preserve and suggests that appropriate interpretive signage be created to address those issues/items. Likewise, an interpretive master plan should be undertaken to develop the graphics and storylines for the topics identified in this report.

The following are key objectives of the 2014 Master Plan:

- Develop a comprehensive, 25-year master plan to provide a framework to accommodate increased visitation and program needs, while preserving ecosystem function and enhancing visitor experience and education.
- Identify opportunities and constraints of the site for facilities and programming while conserving the ecological resources and values of the Preserve.
- Develop an overall site design for facilities, parking, and visitor engagement along with a refinement of the existing trail system.
- Recommend protection, development, and maintenance options for the Preserve based on the desires of the community and the CIB.
- Identify and prioritize the areas of the property recommended for amenities, associated support facilities, and the costs associated with each.
- Understand, catalog and interpret the various ecotypes on the Preserve that include upland fields, freshwater wetlands, a mixed hardwood and pine forest, salt marsh, a sandy bay beach and a saltwater cove.
- Identify needs and opportunities for additional resource enhancement, ecological restoration and green infrastructure for the Preserve lands.
- Consider the impacts of climate change on sea level rise in regard to the Preserve's habitats, ecosystem, and infrastructure and how this influences the suggested placement of site amenities.
- Present design concepts and principles to form the basis for further design refinements, additional engineering studies, construction documentation, and ultimately the construction of the Preserve's amenities as funding becomes available in subsequent years.

Master Plan Funding

Funding for the 2014 Master Plan is made possible because of the generous funding support in the form of grants from USEPA National Estuary Program, the State of Delaware, Sussex County Council, and the University of Delaware Sustainable Coastal Communities Initiative.

Selection of Master Plan Design Team—Oasis Design Group and Biohabitats

After a regional search, the CIB hired Oasis Design Group (Oasis), a landscape architecture, master planning, and urban design firm in Baltimore, Maryland, to develop a long-term master plan for the Preserve. Oasis led the master plan design process and facilitated public workshops for the Preserve. Oasis and its subconsultant Biohabitats Incorporated, an ecological restoration firm, worked with the CIB and its stakeholders to create a comprehensive master plan to provide a framework for education and restoration program space and facilities at the Preserve and to promote, integrate, and foster ecological stewardship. The collective expertise of Oasis and Biohabitats and their understanding in ecological principles and knowledge of how to move people through a site while educating visitors on what they are seeing and experiencing providing the CIB with the necessary direction to create its master plan.

Master Plan Process/Timeframe

As part of the master planning process, Oasis led and facilitated one public and highly interactive participatory work session, which took place in May 2014. Input and ideas were sought from key stakeholders from the CIB and the Preserve— staff, volunteers, various community members, educators, friends/ financial donors—that helps to produce a master plan that meets their collective objectives and maximizes the potential of the 150-acre public preserve. Open forum meetings/discussions were used to evaluate and assist in benchmarking past efforts as presented in previous planning efforts; identify strengths and weaknesses of the Preserve; evaluate how Preserve was or was not functioning; assess and open communication; and reveal people’s thoughts about the future of the Preserve. Oasis conducted exploratory work sessions with the various groups and individuals as noted in the Appendixes as well as conducted one-on-one personal interviews to best obtain true perceptions and desires for the Preserve. Aside from an occasional individualistic desire or differing comment based on an individual’s viewpoint there was an overwhelming commonality on the data gathered. It was clear from the feedback garnered that the stakeholders wanted to preserve the natural character that currently exists on the site.

Identified Physical and Facility Needs

This data from the work sessions, in part, was used to assist in work toward developing future goals and objectives.

The following is a list of the identified physical and facility needs listed in no particular order:

1. Expand parking facilities to accommodate increasing visitation.
2. Improve the Preserve welcome area and trail gateways.
3. Open a flexible area for special events, plant sales, etc.
4. Improve storage facilities and grounds for education, maintenance, and concessionaire(s).
5. Provide permanent restroom facilities.
6. Improve educational cuing, seating, and teaching spaces for school programs.
7. Plan for trail improvements and maintenance that addresses ecological or human stressors.
8. Include a nursery area for restoration project equipment/materials.
9. Improve educational/interpretive signage.
10. Provide locations for commemorative memorials or gifting recognition.



DCIB Executive Director, Chris Bason, addresses a group of stakeholders

ECOLOGICAL CONTEXT AND EXISTING CONDITIONS

The Inland Bays

The Inland Bays are three interconnected coastal lagoons along the Delaware shore, situated behind a narrow barrier island that separates them from the Atlantic Ocean. They are the meeting place for the freshwater from upland areas and the saltwater flowing through inlets from the sea, and therefore provide important habitat to many organisms. The 292-square-mile watershed of the Inland Bays empties into 35 square miles of bays and tidal tributaries. It is also home and stopover point for a wide array of migratory waterfowl and other birds.

At only 3-8 feet deep, the Bays are relatively shallow and poorly flushed by tidal movement, so they are especially sensitive to environmental change. Increases in pollutants, changes in salinity, and fluctuations in water temperatures have dramatic effects on water quality, and on plants, fish, shellfish, and microscopic creatures. Because the Inland Bays are located in an area heavily transformed by agriculture and development, and very close to the resort towns of Rehoboth, Bethany and Ocean City, the Bays are altered by those changes in the landscape that can have lasting detrimental effects on the quality and quantity of key habitats found in the Inland Bays.

Inland Bay habitats include salt marsh, high marsh, maritime forest, freshwater wetland and tributaries, open waters, shallows, underwater meadows (submerged aquatic vegetation or SAV), intertidal flats, and sandy beaches. Marsh habitat is particularly valuable, providing shelter and food for many terrestrial and aquatic creatures. The salt marsh is also considered one of the most productive ecosystems on earth—supporting a large amount of biomass in roots and rhizomes below the surface. Over time, this decomposes and forms a rich detritus that provides shelter and food for young fish, crabs, and other species. The marsh also acts as an important first line of defense when it comes to water quality and flood protection, filtering water and protecting the land by mitigating storm surge and floods during hurricanes and large storms (e.g., nor'easters).



A turtle retracts in its shell when spotted on the Preserve property

The Preserve— Environmental Context

Mapping of the existing plant communities and habitat areas was developed based on existing mapping data and a one-day site visit meeting (Refer to Exhibit 1 - Vegetation Communities, Landscape Ecology and Connections). The mapping was developed using available State spatial geodatabase GIS data including Veg_community_2002_imagery - Vegetative communities derived from 2002 Imagery of the State; and Delaware Wetlands - Update of the existing USFWS National Wetlands Inventory (NWI) and Delaware Statewide Wetland Mapping Project (SWMP) data. The existing vegetation communities and habitats were depicted from the vegetation community data and modified to reflect the management and restoration efforts undertaken on site, as well as current conditions observed from aerial photos and one site visit. In addition to eight natural communities (lumping the planted tree cluster areas in the native meadow) two maintained landscapes are cultivated grass and native landscape plantings. An important part of the function and value of the Preserve habitats is their connection to adjacent habitats in the broader ecosystem.

The corridor connections depicted on Exhibit 1 show how the site connects to a larger ecological matrix of habitat patches as well as site-specific wildlife and habitat connectivity potential. It also shows connectivity to adjacent habitats including Indian River Bay. The large blue arrow depicts an interpretation of the major corridor connection across the Preserve landscape/habitats and the smaller pink arrows on depict secondary connections from the main corridor.

The 100-foot-offset buffer from all wetlands is not a regulatory buffer, but an important ecological buffer to be considered as a minimum for reducing the effects of land disturbance/development and other encroachment activities on sensitive wetland habitat. The buffer can also serve to protect water quality in wetland and aquatic areas of the estuary.

Ecological Pressures, Constraints and Opportunities (Refer to Exhibit 2) represents the existing and potential future ecological stressors and threats that could potentially impact native communities, habitats, species, function, and biodiversity within the Preserve. This figure depicts generalized zones of ecological conservation and restoration including Wetland Preservation, Forest Management, Meadow Management, and Estuarine Restoration.

Based on a review of the existing habitat conditions, ecological pressures (threats and stressors), constraints, and needs, a set of recommended opportunities are provided for ecological protection, restoration, biodiversity conservation, and adaptive management, particularly in light of climate change and sea level rise (SLR). The specific opportunities this plan identifies for restoration and management include shoreline and marsh protection and restoration, oyster reef establishment, eelgrass restoration expansion, deer management, additional tree planting, and continued and expanded invasive plant management, as described in below.

Considerations for Climate Change

“While seas are rising globally, the phenomenon is not occurring at even rates around the world. A 2012 study by the U.S. Geological Survey concluded that sea levels along the East Coast will rise three to four times faster than the global average over the next century. While levels worldwide are expected to rise an average of two to three feet by 2100, they could surge more than six feet along the Atlantic seaboard.” Davenport, Coral. (2014, March 28). Rising Seas. The New York Times. Retrieved from <http://www.nytimes.com>.

Global climate change and the associated SLR are predicted to be particularly impactful along the Mid-Atlantic coast, including Delaware. Observed SLR changes during the last century have already begun to show impacts to coastal habitats, infrastructure and communities. The DNREC Sea Level Rise Technical Workgroup recommended a range of sea level rise scenarios corresponding to Low: 1.6 feet by 2100; Intermediate: 3.3 feet by 2100; and High: 4.9 feet by 2100. Recent refined predictions indicate the potential for accelerated rates of SLR increase and associated impacts. In studies related to the Intergovernmental Panel on Climate Change’s 2014 5th Assessment Report the potential is for an additional 1.7 feet of projected SLR along the Mid-Atlantic Coast, including Delaware, by 2050. A variety of state, federal and non-government organizations continue to monitor and assess the project rate and impacts of climate change and coastal SLR.

There are future SLR prediction data layers available from the State Spatial Data Geodatabase for Sussex County. This information is generated from predictive modeling to provide information on future SLR scenarios. The modeling output provides a varying range of associated relative extents of inundation of land areas by landward movement of the mean higher high water line. Three different scenarios are projected and provided in the spatial data for the County including a 50 cm, 100 cm and 150 cm SLR scenario. For purposes of this master plan a 100 cm (or approximately 39-inch) SLR was selected for depiction in the assessment graphics (Refer to Exhibit 3 – Sea Level Rise Scenario) as the mid-range scenario between a low (no accelerated increase) and a high-range accelerated and extensive rise.

SLR will continue to have implications and impacts on the Preserve’s habitats, ecosystem, and infrastructure. SLR will exacerbate conditions already present for shoreline erosion, beach movement, and tidal marsh loss at Pasture Point, the Preserve beach and the salt marsh habitats. Measures for habitat conservation, restoration and adaptive management are needed in the face of the predicted SLR for the Inland Bays and the Preserve. Master planning level recommendations to address integrated conservation, enhancement, restoration, and resource management needs are provided in the Natural Systems Restoration and Management section.

DESIGN CONSIDERATIONS AND PROPOSED FACILITIES

The design program for the Preserve's improvements was largely established by the CIB prior to initiation of the master planning process and confirmed during the public meeting by the community stakeholders. Following that initial public meeting and based on that design program, the Design Team—Oasis and Biohabitats—developed preliminary concepts that addressed the issues for the entrance area, maintenance area, beach area, and trails.

The concepts generally identify areas where major preserve improvements will take place and illustrate their adjacencies and connectivity to one another. After the initial presentation of the concepts, as listed below, the concepts evolved into the final form based on the input from the CIB, continuing awareness of existing site conditions and general recommendations from the Design Team. Other smaller scale improvements and management concepts that are not effectively illustrated are described in other sections of this report.

The most pressing need for enhancement at the Preserve and thus requiring the most design effort relate to areas associated with the entrance to the Preserve. Currently, these include the entrance drive off Cedar Neck Road, the parking lot, and launch point into the trail system that includes access to an existing kiosk. Both preliminary concepts—Gateway Concept A and Gateway Concept B—strive to address those areas in general as well as increase parking availability using sustainable design principals, provide access for buses, create an event lawn adjacent to the parking area for special events, enhance trail gateways and visitor welcome experience, and create an arboretum meadow that showcases trees found either on the Preserve or in the Delmarva Peninsula. Each concept presented below addresses these programmatic needs in a variety of locations, sizes, and configurations.



The current parking situation at the Preserve

Gateway Concept A (refer to Exhibit 4)

The driveway into the Preserve from Cedar Neck Road and the parking area is designed around the existing kiosk to prevent moving the kiosk and to make it easily seen when entering the Preserve. This concept expands the current visitor parking to approximately 18 cars with provision for turning movement and temporary parking of a bus. The parking lot is tear shaped with a bioretention area in the CIB of the circle to accommodate stormwater. The concept is fundamentally organized on two axis lines: 1) a parking axis line that runs parallel to Cedar Neck Road from the entrance drive through the center of the bioretention area through the event lawn, and 2) from the existing kiosk west through a proposed arboretum meadow to the existing pavilion.

At the western side of the parking circle is the entrance to the Preserve where visitors are greeted by a donor recognition wall with a backdrop of a manicured native butterfly garden. A self-composting toilet has been located in this general vicinity. Immediately to the west of this is a native meadow with arboretum-style tree plantings that showcase native trees— again, as with the event lawn, the arboretum meadow is also flanked by pathways. The southernmost edge that borders the southern property line, is envisioned to be heavily reforested with native trees. Terminating the axis line and on the western edge of the arboretum meadow is the existing pavilion. The pavilion is transitioned from its current use as a storage garage into the hub and central gathering point for educational programming. Here a small lawn space provides the CIB with space for flexible programming. An associated seating amphitheater provides outdoor classroom seating for lectures or demonstrations.

An event lawn has been suggested immediately to the north of the parking lot and is flanked on either side by trails. In both concepts, the event lawn is located immediately adjacent to the parking lot for ease of access for special events and to accommodate for logistical, programming, and service needs.

The Maintenance Facilities remain in their current location however have been expanded and screened from the education area immediately to the north (see Maintenance Facilities section below).

Gateway Concept B (Refer to Exhibit 5)

This concept is the most aggressive in the provision for visitor parking and will accommodate approximately 37 cars with provision for a bus. The parking lot is circular with a bioretention area in the center of the circle. A created central axis line connects the CIB of the parking circle with the existing pavilion deep into the Preserve. The concept's organization is based off this axis line.

The driveway from Cedar Neck Road and the parking area again is designed around the existing kiosk to prevent moving the kiosk and to make it easily seen when entering the Preserve. At the western side of the parking circle is the entrance to the Preserve where visitors are greeted by a donor recognition wall with a backdrop of a manicured native butterfly garden. A self-composting toilet has been located in this general vicinity. Immediately to the west of this is an event lawn flanked on either side by trails. In both concepts, the event lawn is located immediately adjacent to the parking lot for ease of access for special events and to accommodate for logistical, programming, and service needs. Continuing westward, visitors may enter into a native meadow with arboretum-style tree plantings that showcase native trees—again, as with the event lawn, the arboretum meadow is flanked by pathways. The southernmost edge that borders the southern property line is envisioned to be heavily reforested with native trees.

Terminating the axis line and on the western edge of the arboretum meadow is the existing pavilion. The pavilion is transitioned from its current use as a storage garage into the hub and central gathering point for educational programming. Here an associated flexible lawn space provides the CIB with flexible programming. An associated seating amphitheater provides outdoor classroom seating for lectures or demonstrations. And, finally, as elaborated more in the Maintenance Facilities section below, the current maintenance area is

no longer in its current location and now resides in an area to the north in order to completely eliminate the conflicting use requirements for the maintenance area and the education area.

Beach Access (Refer to Exhibit 6)

The beach access point and the beach area are a hub of activity and among the most popular sites in the Preserve. The beach is accessed via a boardwalk that traverses a low dune. The boardwalk's platform with built-in benches serves as a learning station for education talks. In addition, the beach area hosts such activities as swimming, estuarine exploration, and daily picnicking and plays hosts to the Preserve's concessionaire for water activities, predominately kayaking.

The preliminary concept formalizes these activities and provides either a designated location or a specific built element to support the activities. The developed area is located in the open area immediately preceding the beach access boardwalk. This preliminary concept suggests an amphitheater-like seating area as a learning circle located on a point facing the northeast capturing views of not only the Inland Bay but also the salt marsh, picnic tables, a composting toilet, and an enlarged open area for informal gathering or other spontaneous activities. In addition, a more substantial and formalized kayak storage facility is suggested, which includes an associated storage facility for the CIB's teaching equipment. This entire preliminary concept in general was rejected in favor of a less formalized area.

Trail System (Refer to Exhibit 7)

The Design Team began looking at the existing trails system with the idea that the system should enable visitors to have easy and clearly defined access to all the major ecological areas present on the Preserve without imposing undue stress to the environment. Undue stress may happen in many ways and may include deviation by pedestrians from the core trails, unauthorized access/use of sensitive areas, or disturbance to sensitive wildlife zones or areas. Additionally, human factors such as relative proximity to neighboring parcels might impose disturbance to visitors in an otherwise natural and serene environment. Concern was expressed by some stakeholders about safety and being alone in the woods but in the end the CIB felt that the type of environment available to guests warranted some level of adventure.

Based on those factors the Design Team analyzed the existing trails, their connectedness to key ecological environments and clarity of use. The Design Team preliminarily recommends trail removal as well as the addition of trails. Three trails were initially recommended ultimately for removal and included 1) a portion of the blue trail (current CIB trail demarcation) trail that runs parallel to Pasture Cove Point marsh as it is beginning to show signs of inundation and stays constantly muddy; 2) removal of the yellow trail that bisects the large track of hardwood forest thus eliminating internal wood disturbance for animals and song birds, and; 3) removal of the woodland amphitheater trail spur and the wood amphitheater; 4) proposed removal and rerouting of the red trail immediately adjacent to the light industrial property along the southwest property boundary to eliminate negative visual influences. Stakeholders ultimately decided that there were too many interpretive opportunities utilized by docents on this trail for its removal and that those factors outweighed the negative visual influences.

Several additional trails are proposed at the entrances from the parking lot immediately surrounding the lawn and arboretum that will provide a cleaner, more readable gateway entrance to the Preserve. Additionally, one other trail is recommended being added to go through the warm season grassland on the east side of Cedar Neck Road so that full immersion into the restored meadow will be obtained versus simply walking around the perimeter, which is where the current trails exist.

Maintenance Facilities (Refer to Exhibit 6)

Of primary importance in considering the location and function of the maintenance facilities was separation from other Preserve activities—primarily separation from the current educational activities area and existing pavilion. The preliminary concept presents two options for the maintenance facilities for which one includes relocation from the current location to a site to the very northern edge of the Preserve. Access is from a new road created off Cedar Neck Road paralleling the very northern property line. This concept was ultimately rejected in favor of maintaining its current location primarily due to the proximity of existing water and electric service.

The expanded and improved maintenance facility (maintaining the original location) proposes new storage buildings, a central yard for maintenance activities, locations for bulk materials storage (mulch, restoration equipment, etc.), and an expanded nursery. However, of primary importance, aside from expanded room and storage facilities, is the visual and physical separation from the proposed more formalized education area. To accomplish this, the overall maintenance yard is separated by the addition of an evergreen screen located between the two areas as well as shifting most of the maintenance activities to the southwest immediately adjacent to the property line.

MASTER PLAN

The proposed James Farm Ecological Preserve master plan merges the conceptual ideas presented in preliminary concept diagrams with the overall mission related objectives of the CIB and opportunities and limitations of the site as it pertains to the natural systems. More specific feedback from the CIB and comments from its stakeholders on the conceptual diagrams yielded a series of additional/refined (Refer to initial programmatic ideas in the Gateway Concepts A & B) ideas that were incorporated into the final master plan.

The final physical plan articulates the sizes and shapes of the elements more definitively and recommends management strategies for maintaining the sensitive environment of the Preserve to the extent possible. Detailed description for the elements identified in the proposed master plan are listed below (Refer to image below and Exhibit 8 for the larger version).

The ideas—

- Minimize any development along the beach area and provide only for kayak storage.
- Keep the maintenance area in its current location with separation from the education area.
- Create named trail loops to better organize trail system.
- Maximize parking capacity to approximately 27 spaces.
- Illustrate expanded/overflow parking area on east side of Cedar Neck Road.
- Provide for clear trail gateway demarcation at Cedar Neck Road trail junction points.
- Expand the maintenance area to include an open-sided pole building for large equipment storage and identify an area for bulk dry goods storage (mulch, etc.).
- Provide for education storage in the education area.
- Remove trails that run adjacent to marsh on western edge (blue trail) and remove central connector trail (yellow trail).
- Provide security along the Preserve's southern boundary and limit access from neighboring parcels.



Master Plan by Oasis

Entry Zone

The entry zone to any property or facility makes a lasting first impression on visitors and sets the tone for what these people are about to encounter throughout the entire space. The entry zone must clearly identify the site from adjacent roadways approaches, have a clear entrance point delineated, must provide clear visual cues as to where to park, clearly identify points of entry into the Preserve (trail heads/welcome kiosk), and be aesthetically pleasing.



Entry example option A



Entry example option B

The current entry point to the Preserve will be maintained and enhanced. New Preserve identification signage possibly incorporating wood as part of the design theme and more significant landscape plantings will create a stronger gateway into the Preserve. Likewise trailheads along Cedar Neck road, one located directly opposite to the entrance sign on the south side of the road, should also be developed in a similar thematic style. The parking area will be expanded (see below description) and aligned to keep the existing kiosk but more importantly to create a visual link to the existing pavilion within the Preserve to the west. To achieve this, removal of some of the regenerative forest that is currently in early successional stages will be needed to create a visual corridor into the Preserve while creating a landmark that will serve to draw guests in. The center of the parking lot, envisioned as a bioretention area, and the pavilion create an east/west axis line. A second north/south axis line is created from the entrance drive (paralleling Cedar Neck Road), again through the bioretention area, through the open lawn area. These two organizational axis lines help create a logical organization to the entry zone.

Pet Policy

Pedestrian entry points into the Preserve are more formalized than what exists and the location of the existing kiosk is in immediate relation to the point the guests leave the parking area and enter the trail heads. Integral to this pedestrian entry zone is envisioned to be a donor recognition wall, butterfly garden, a rules and regulations board for the entire Preserve, dog station (see below under the Dog Policy section), and a composting toilet. The centralized and clustered location of these elements strengthen the sense of arrival and demarcate the gateway point into the Preserve.

Rules regarding pets/dogs and should be displayed within the policy/rules and regulations panel at the entry zone kiosk and on appropriate signs throughout the Preserve. Dogs must be on a leash. CIB is not limiting where dogs can be at this time or specifying leash length.



Example donor recognition wall

Parking

The parking area to the Preserve is an important aspect to the property as it is one of the first things guests experience as they enter the property. Aside from being functional, the parking lot must be aesthetically pleasing and provide the proper launch point for guests to explore the property. The design of the current parking lot does not function well in that it does not accommodate buses nor does it have the capacity for vehicles sufficient for the growing demand—the current lot only can accommodate approximately 7-9 cars. The future parking design work needs to utilize low impact design principles in order to demonstrate protection of the environment, including reducing stormwater run-off and addressing water quality protection.

Therefore, the Design Team proposes a new parking area design that is aesthetically pleasing, increases the parking capacity to 27 vehicles and 1 full-size bus, and improves upon the movement of people, vehicles, and buses. A tear-drop shaped parking area design enables buses to enter the parking lot, make the proper turning movement, and drop-off passengers in a designated zone. The Design Team suggests that the surface of the lot be crushed shells in similar fashion to the current lot. The parking area shall be contained by a cobble curbing system. sidewalks surrounding the parking lot direct people to the various trail heads. The sidewalks are envisioned to be of exposed aggregate concrete then transition into mulch pathways once outside of the formal entrance zone. Stormwater from the lot, which is for the most part pervious, shall be accommodated by a bioretention depression in the center of the tear drop. Some type of bronze, nature-inspired sculpture surrounded with native sedges and perennials could accent the space and serve to highlight wildlife present on the Preserve thus creating a more welcoming space.

Overflow parking is provided on the east side of Cedar Neck Road and has been done so informally. The plan suggests that a mowed lawn area in the configuration of a formalized parking be created and maintained simply by a regular mowing regime in the designated configuration. A central island of meadow grasses separate two bays of parking. The plan illustrates space for approximately 70 overflow parking spaces or additional cars during special events cars. A parking lot site plan should be engineered (dimensionally) and formally staked out in the field. These stakes will delineate the mow lines that should be maintained.



Cobblestone areas and borders accent the permeable crushed oyster shell driveway

Arboretum Meadow

One of the main design concepts for the entrance to the Preserve is to create a more open and welcoming entrance experience. The location of the arboretum meadow creates a visual link to the existing pavilion by opening up the view or clearing some of the regenerative forest that is currently in early successional stages. Capturing the visual cue of the pavilion entices people into the Preserve. Rather than make this new space lawn, the design draws inspiration from the east side of the Preserve and its warm season grassland. Replacing the early successional forest (that contains few high value species) as delineated on the master plan with a managed meadow accomplishes that visual objective. Thus, this open space area, envisioned as a meadow, should showcase predominately native warm season grasses with an assortment of native wildflowers. Care should be taken to design the proper ecological mix and maintain it during establishment to avoid establishment of undesirable species.

The Design Team suggests that the edges of the meadow immediately adjacent to the flanking pathways be selectively planted with native specimen trees endemic to the Delmarva Peninsula. This provides an opportunity for guests to get close to the trees. Depending on the level of interpretation desired by the CIB, the trees can simply be labeled with both the botanic and common names or can include more information about their cultural requirements, habitat, range, and ecological.



A meadow blooms goldenrod in late summer

Event Lawn

An open lawn area is designed on the west side of the Preserve to provide an open, flexible, and easily maintainable space for programmable events such as plant sales, formal dinners/tented events, concerts, and festivals. The open lawn is located on an axis that extends through the bioretention area of the parking lot from the entrance drive. The lawn is located immediately to the parking lot so that it is easily accessed and provides immediate access by service vehicles, catering, and/or maintenance crews. Care should be taken to maintain the lawn in an organic fashion and may even present an opportunity to interpret organic turf grass horticultural practices.



Stunning autumn foliage creates a fantastic boundary for the event lawn

Education Gathering Area

The Preserve needs to have improved facilities and spaces to accommodate the increase in the number of visits by groups of children. Spaces are needed for cuing groups, gathering, lectures, and activities. Facilities are needed to support teaching activities and associated materials.

Currently, there are several informal gathering spaces located throughout the Preserve; however, there is no one area that is central to the property that provides all of the necessary spaces for the activities noted above. In addition, the current space that supposedly supports those activities is inseparable from the current maintenance area and in fact the pavilion is used for maintenance equipment.



An open-air building provides shelter for education



Students learn in the outdoor classroom

First and foremost, the proposed education gathering area is completely separated from the maintenance area. Activities from both areas have been separated operationally, physically, and visually. The existing pavilion now becomes a central feature for the education gathering area. It is envisioned that the existing pavilion would be architecturally modified to be more of an enclosed structure having two parts and serve as the education support structure. On the northern half, would be a screened in summer pavilion; the southern end of the structure would be enclosed with two rooms. The education support structure is recommended to accommodate all of the necessary teaching materials needed by the CIB's instructors/docents. The education support structure will accommodate the storage of equipment such as waders, buckets, drip nets, seine nets, etc., and storage of teaching materials and resources such as bins for small equipment and supplies, field guides, maps, etc, water quality test kits and/or other testing/measuring equipment, and clipboards and student activity booklets etc. The structure should have water and electric service. Lastly, there should be ample space for a work area for teachers that will also include a small microwave, refrigerator, and desk. The exact size and full functionality of the structure is to be determined and will require the assistance of a design professional, possibly an architect. The architect would need to be engaged to investigate the design modification of the pavilion as well as explore any zoning or code issues related to the suggested modifications. A more detailed evaluation of the needs at the time of design for this structure should be undertaken with the CIB to assess the appropriate program and size for the structure. The CIB should carefully consider whether to have more informal operation that simply houses equipment verses a more formalized operation that may propel the structure into more of a building that will require more extensive design, service requirements, permitting, and initial and ongoing costs.

Various support elements are located adjacent to the existing pavilion (new education support structure) in order to improve the functionality of the area. A new open air pavilion is envisioned and located on the very northern edge of the new open lawn. A seating amphitheater that could accommodate approximately 12-15 students with intimate proximity between the students and teachers is to be located immediately to the south of the new pavilion and central to the new pavilion and renovated pavilion to make lectures convenient. Furthermore, the amphitheater is to be situated within a larger turf area that will accommodate spill-over activities and in general provide an open, flexible space to be programmed by educators as they see fit. A composting toilet is planned to be located to the south of the education structure to support the area. It is also conveniently located in the buffer area that separates the education gathering area and the maintenance area thus providing a resource to both areas.

Composting Toilets

An important consideration of the master plan is in providing restroom facilities to the visitors and educational groups of the Preserve. The master plan has identified two locations within the Preserve for sanitary facilities (composting toilets). Examining practices from national and state parks leads, whom are increasingly utilizing composting toilets for their environmental and cost benefits, illustrate a variety of recommended options.

Composting toilets treat human waste biologically similarly to how leaves or food scraps are composted. When built correctly, these systems produce no odor. The toilets are typically dry or do not require water for flushing and provide an environment for aerobic bacteria and fungi to break down wastes. The process reduces waste to less than 30 percent of its original volume and produces a soil-like material called “humus”. After the composting process is completed, the humus is then either buried or removed by a licensed seepage hauler depending on local laws and regulations.

There are several different types of composting toilets are available ranging from complete ‘off-the-shelf’ manufactured units to site-built vaulted systems. There are several manufacturers for self-contained or centralized units including Sun-Mar, BioLet, and Phoenix. These systems can receive human waste continuously, compost it over time, and can be emptied easily from a drawer at the bottom of the device. The vaulted systems are site-built and are comprised of two or more chambers located below the toilet level. The human waste drops into the current receiving chamber, while full chambers are closed off and left to compost. Completely composted chambers will be emptied, and rotated to become the receiving chamber. Both of these systems require electricity to power ventilation fans and generate enough heat for decomposition. A sanitary consultant should be contacted to research local environmental regulations, determine load capacities and recommend an appropriate system for the Preserve.



An example composting toilet structure with photovoltaic panels on the roof

Maintenance Area

The maintenance area remains in its current location; however, it will be expanded. Access to existing water and electric services and access from the current access road drove that decision. However, as noted in the previous section, maintenance area needs to be separated from the pavilion and its adjacencies. Thus, the maintenance area is reorganized, expanded to the west, and visually separated from the proposed education gathering area.

Three new structures are called out for in the master plan. Two structures are envisioned to be permanent storage buildings and the third is a three-sided equipment storage building, which will house larger maintenance equipment such as mower decks, tractors, etc., which are currently being housed under the pavilion.

The new structures should be designed in the Eastern Shore farm vernacular and built with quality materials and quality craftsmanship. The sheds currently in place should be removed as the new structures come online. Other uses for the general vicinity include dry-goods storage bins. Bulk materials storage (mulch, oyster shells, etc.) should be located behind the equipment storage building or in a general area that is visually out of site from guests. The current site for mulch storage on the eastern side of Cedar Neck Road should be relocated to the maintenance area. All future storage for bulk materials should be in the maintenance area thus avoiding exposure to the general public.



An example of an eastern shore farm's charming architectural style

Trails

Pedestrian trails need to be designed to be responsive and respectful of the ecological systems they traverse. The master plan calls for both the removal as well as the addition of trails. The master plan also recommends a general reordering of the trail system to create individual loops. Doing so helps to create a more understandable or readable trail system helping the Preserve's guests more aptly decide which loop they will like to traverse with less risk of getting lost. Each trail loop should be color coded with trail markers similar to the current system and mapped on a brochure or trail guide with the associated distances for each loop. Naming of these loops could present the CIB with a gifting opportunity. Special trail demarcation should occur where trails intersect Cedar Neck Road as this will present a strong visual cue both to vehicles passing through the Preserve as well as provide a strong identification marker to identify trails on the other side or west side of the Preserve.

Trails should be located to have the lightest footprint on the landscape and should avoid fragmentation of sensitive habitat areas including forest. New trails as delineated on the master plan predominately relate to the reordering of the entrance area. These new trails essentially are created to both delineate use areas (the arboretum meadow and the event lawn) as well as create a more direct route to key existing amenities or features. The two instances under this category include providing a more direct and purposeful route to the education pavilion and area and creating a new meadow walk through the meadow on the east side of the preserve. In both instances where new trails have been created they were either in recently restored low impact areas or in areas that were under early successional reforestation thus having minimal impact to existing functioning ecosystems.

Several trails are recommended to be abandoned. These trails are those that are either adjacent to the southwesterly salt marsh or running through the middle of the oak forest. The trail adjacent to the salt marsh should be removed as it impacts sea-level rise and creates a wet condition. This creates both a hazard for the Preserve's guests as well as damages the soils and vegetation. However, in areas with similar wet conditions that are to remain, boardwalks should be considered where trails intersect with or travel across wetlands and marsh areas. The second trail recommended to be removed is being done so to maintain a large and intact ecosystem intact minimizing intrusion and disturbance from humans and pets/dogs thus allowing for a more connected habitat area and corridors for native wildlife.

Stormwater Management / Low Impact Development BMP's

Green infrastructure stormwater best management practices (BMPs) provide a multitude of benefits including reducing and delaying stormwater runoff peak volumes, enhancing groundwater recharge, filtering and capturing stormwater pollutants, increased carbon sequestration, reduced energy demands, improved air quality, additional wildlife habitat, lowering water consumption and treating more pollutants onsite, lessening maintenance costs, improving air quality, creating natural habitat for diverse ecosystems; providing educational opportunities; contributing to overall sustainability initiatives; and reducing the overall operation and maintenance efforts.

Listed on the following pages are descriptions of the green infrastructure stormwater management practices that are most relevant for consideration at the James Farm Preserve property.



Bioswale - Photo copyright © Jennifer Dowdell

Functional landscapes provide benefits and functions to the broader ecological system through the handling of stormwater, wastewater, or other elements in the landscape. These include bioswales, rain gardens, native plantings, restored habitat areas, and bioretention. Bioswales and bioretention can be incorporated into the landscape to convey or infiltrate stormwater flowing from rooftops, parking lots or trails. They can be designed to be aesthetic features in the landscape, incorporating native plants as well as stone and other organic materials (wood chips, logs, etc.).

Integrated trails can be designed to be responsive and respectful of the ecological systems they traverse. Trails should be designed to have the lightest footprint on the landscape and should avoid fragmentation of sensitive habitat areas including forest. Boardwalks should be considered at locations where trails intersect with or travel across wetlands and marsh areas. Integrated stormwater management techniques, such as bioswales, should be designed along trails where appropriate and trails should be designed to convey stormwater runoff in a dispersed fashion.

Green roofs provide an opportunity to absorb and slow stormwater runoff from rooftops. They also provide habitat for birds and pollinators. Green roofs for small-scale facilities should be considered, when appropriate and complimentary to a structure's design. They are most successful when they are visible or accessible to the visitors at a given location. A green roof can be incorporated into the design of any new structures or pavilions planned for the Preserve, as both shelter and educational opportunity.



Integrated Trail - Photo copyright © Jennifer Dowdell



Pavilion Green Roof - Photo copyright © Jennifer Dowdell

Permeable Pavement can be installed where sidewalks, parking areas, and service roads traditionally generate runoff. Pavers or colored porous concrete can be used to visually demarcate special parking areas. Permeable pavers can be designed to allow for infiltration into subsurface cisterns for reuse or slow release into the soils.

Conveying stormwater through pipes or concrete channels degrades the surrounding environment by speeding up flows, causing erosion, and denying infiltration. Regenerative Stormwater Conveyance (RSC) uses restoration techniques to create a vegetated open channel flow along steep slopes at stormwater outfalls, in day-lighted sections of streams, or in created or restored swale systems. It is often composed of a sand seepage bed, riffle weirs made of boulders and cobbles, a mulch and compost layer, and native plant communities. The RSC design provides a more self-sustaining and resilient conveyance for water than traditional grey infrastructure. Amongst the functions that RSC promotes, it allows sediment to settle out in a series of pools, aeration of water to occur through riffle structures, and restored ecological function through vegetative enhancement. RSC is often considered less intrusive than other conveyance stabilization techniques. It dissipates energy by slowing the flows, provides infiltration through the sand bed, and has a natural appearance.



Permeable Pavement - Photo copyright © Jennifer Dowdell



RSC - Photo copyright © Biohabitats

Beach

The beach is recognized as one of the more predominate features and is the most popular spot at the Preserve. It is the intersection of several habitat communities and the only direct point of access to the Inland Bay. An early master plan concept explored and suggested more intense development of the area programmatically; however, it was determined that the best course of action is to allow the general vicinity to remain in its natural state in so much as possible. The exception is to maintain the existing beach access boardwalk and associated gathering platform as it serves to protect the dune from pedestrian traffic providing a low impact accessible route to the beach itself. In addition, a carefully located and tastefully designed kayak storage facility to accommodate the current concessionaire is desired. In order to keep the beach area in its naturalistic state as much as possible, no other elements are to be located in this general area.

Natural Systems Restoration and Management

During the planning process, the Design Team guided the application of programmatic needs of the CIB to the Preserve by using an extensive overlay of ecological components. A number of threats and stressors are present that impact the natural ecosystems, associated communities and their condition, viability and function at the Preserve—some align congruently with the physical elements of the master plan while others function independently as overall ecological issues—all are interconnected to some extent. These threats and stressors are often caused directly by human impacts such as development, which potentially displaces habitat or creates other disturbances such as stormwater run-off and erosion. In addition, land management practices like ditching, mowing, fertilizer application, waste disposal, and human or animal encroachment also create stressors in ecosystems.



A simple structure with similar architectural character can serve as the beach's storage building

For the habitats found at the Preserve a set of associated threats and stressors impact the ongoing management of the Preserve and as implementation of master plan occurs the following ecological impacts will need to be managed:

- Shoreline and beach erosion and landward migration;
- Marsh loss, particularly at Pasture Point;
- Foot traffic, noise and light pollution from the peripheral development;
- Invasive plant vectors along the roadway and other disturbed edges of the Preserve;
- Stormwater runoff from adjacent properties;
- Invasive species (i.e., woody invasive species such as callery pear, privet and honeysuckle); and
- Climate change and SLR (mid-range predictions are for 100 cm of rise).

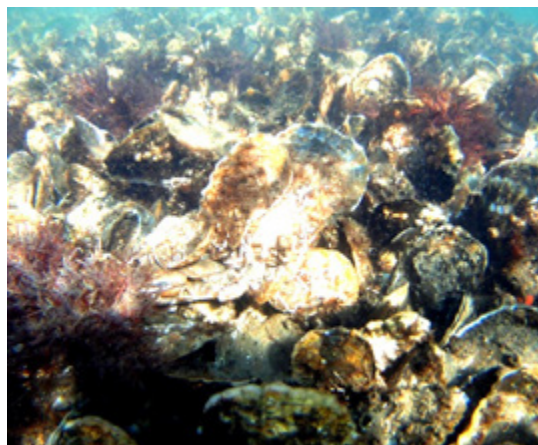
Estuarine Restoration

The proposed estuarine and associated shoreline restoration at the Preserve provides opportunities that directly impact the resources of Indian River Bay in a positive way, building upon the efforts the CIB has already undertaken. Restoration opportunities include a living shoreline and marsh restoration, oyster reef establishment, and eelgrass restoration. These restoration measures are part of a comprehensive set of strategies for improvements in this part of the ecosystem, and they also provide enhanced learning opportunities critical to the CIB's mission.

The implementation of additional estuarine restoration measures will not only address current resource impact issues, but also it will help buy some time to learn and adapt as sea level continues to rise and potentially accelerate its rate of advancement, inundation, and system modifications.

Oyster Reef Establishment

Viable and functioning oyster reefs are known to improve water quality. Oysters, as filter-feeders, reduce the impacts of nutrient pollution as well provide aquatic habitat for other estuarine organisms. Oyster restoration in the waters directly off of the Preserve serve as a local example and educational component in support of the CIB's broader oyster restoration program for the Inland Bays. An oyster reef can be initiated with recovered oyster shells which can be collected from restaurants to keep them out of the waste stream as one example. The collected shells become a valuable component of oyster restoration in the Inland Bays accompanied by oyster spat seeding. The following are opportunities for oyster reef and shellfish restoration at the Preserve.



*An oyster reef restoration pilot project
Photo copyright © Biohabitats*

Living Shoreline Component

A strategic oyster reef array can be used as a valuable natural protective component in a living shoreline system to protect the beach from erosive forces in lieu of a structural breakwater, revetment, or groin features.

Placement considerations: The placement of potential oyster reefs offshore of the Preserve beach needs to be studied and designed to best address navigational and recreational use issues in the shallow waters of the Bay and the appropriate scale and configuration to provide a breakwater function. The viability of water depths at this location is also a key consideration for potential in area of the Preserve.

Ecological Synergy: The use of an oyster reef restoration in the waters along the Preserve can be an integral ecosystem component considered in relation to recreational uses and the beach, marsh areas and areas that may be able to better support eelgrass SAV. The array of ecological elements in a living shoreline and nearshore environment may also be able to accommodate an area of hard clam restoration, in addition to oysters.



*Eelgrass restoration planting
Photo copyright © Biohabitats*

Eelgrass Restoration Expansion

Eelgrass had been historically prevalent in the Inland Bays, but has been absent since the 1970s. It is another key ecological element in efforts to improve water quality and provide habitat. Through restoration of underwater meadows of eelgrass the CIB has been working to restore an area off of Pasture Point adjacent to the Preserve, as a pilot project. As a part of the CIB's continuing efforts to restore eelgrass, the existing restoration can be expanded in conjunction with the other estuarine restoration measures identified. The following items are for consideration of eelgrass restoration expansion at the CIB.

Expansion Considerations: As mentioned above, the location and configuration of additional eelgrass restoration areas need to be considered in light of the other ecological restoration opportunities. These include oyster reefs, tidal marsh protection, and restoration considerations for Pasture Point. Considerations should include protection and depth of potential expansion areas.

Establishment Methods: The means of obtaining and planting eelgrass seed can include methods previously used by the CIB: harvest of seed stalks from the Maryland Coastal Bays, seed ripening and storage, and plantings in designated plots. Additionally, settled ripened seeds from donor locations have been experimented with, in other areas in order to produce plants for restoration at a semi-closed, temperature controlled, eelgrass grow-out nursery. This approach may also be an option for the expansion of eelgrass restoration efforts at the Preserve and the Inland Bays, with less out-of-state donor site inputs.

Adaptive Learning: Not only does the CIB continue to advance eelgrass SAV restoration in the Inland Bays but also it provides additional stewardship and learning opportunities. Volunteers may help plant and monitor selected eelgrass sites and students may be involved in hands-on activities on bay grasses. Information learned in the Inland Bays (from applied research) can be transferred to other eelgrass restoration efforts in the regional and nationally.

Living Shoreline and Marsh Restoration

The shoreline of the Preserve has actively eroded and shifted in response to wave energy, storm events, and SLR inundation. This has resulted in a significant reduction in the area and viability of the tidal marsh peninsula at Pasture Point, the sandy beach area, and the adjacent salt marsh and tidal channel system. The Design Team recommends a living shoreline restoration as a means of protecting and improving shoreline resilience in light of climate change. Three potential scenarios are provided below for further consideration and exploration by the CIB to determine a path forward to address the Preserve's shoreline and associated marsh.



*A restored living shoreline with public access
Photo copyright © Jennifer Dowdell*

Protect and Maintain Beach: This scenario looks to keep the beach and shoreline in its current condition and location. This is problematic because the estuary is dynamic and changing constantly, particularly in the face of watershed changes and climate change related SLR. More conventional shoreline stabilization techniques attempt to armor or fix the shoreline in its current location often employing armoring or large offshore breakwaters, with or without beach nourishment. Often what comes with a harder engineering solution is additional navigational and recreational impact issues, greater permitting complexity, and added costs with little resilience. The Design Team does not recommend a structural emphasis approach for the shoreline. That approach does not fit the character of this reach of the Reserve shoreline and bay, and does not present a good model for the rest of the Inland Bays.

No Action Alternative: This approach is to essentially let Mother Nature take its course and react to current and future changes. This scenario concedes that the shoreline will continue to change. These changes will include the beach migrating into the maritime forest and as the trees die the shoreline zone will become an area of dead tree snags, woody debris and exposed roots limiting access and beach uses. This scenario acknowledges the inevitable loss of the Pasture Point marsh peninsula in the not-too-distant future. The tidal marsh and tidal inlets to the north end of the shoreline will also continue to be impacted, and likely marsh loss to open water will be accelerated. The No-Action scenario provides an educational lesson in climate change and SLR and nature's response and comes at the expense of the Preserve's beach and shoreline uses, programs, and visitor experience.



A restored living shoreline with tidal marsh fringe - Photo copyright © Jennifer Dowdell

Living Shoreline System: A compromise between No-Action and a structurally dominated protection is a living shoreline with multiple elements that use an adaptive management approach to the shoreline system. This approach relies on natural processes and functions, ecosystem-appropriate habitat restoration and adaptive management of a resilient coastal shoreline during a broader timeframe (e.g., 20-year horizon). This scenario includes beach nourishment with sand (based on additional sediment transport study), potential thin layering dredged sand application to extend the life of Pasture Point marsh in an attempt to keep pace with SLR, possible future selective clearing of dying woody vegetation as the beach migrates, modifying the offshore existing type and tidal marsh outlet configuration (also additional hydrodynamic study needed), and include synergistic habitat restoration elements for oysters and eelgrass.

Forest Management

Above the shoreline area and tidal marshes are much of the low-lying wetlands and the upland habitat areas that are primarily forested communities. Since its inception, the Preserve has taken former agricultural lands out of production and promoted their transition to forested communities through restoration plantings and invasive species management. Many acres of the former agricultural fields were planted with native species including a combination of climax and pioneer native species such as oaks, hickories, black cherry, and red cedar. Habitat restoration and reforestation efforts occurred with support through the U.S. Fish and Wildlife Service's Partners in Wildlife Program. There has also been an active invasive species management program in place to treat invasive woody plants including Bradford/callery pear, privet, multiflora rose, and Japanese honeysuckle. These efforts continue to systematically and incrementally decrease the existing invasive plant infestations on-site. Within the native meadow area on the Preserve are more recently planted clusters of oaks and persimmons that form a savannah-type woodland habitat.

Invasive Plant Management

The CIB's staff has been undertaking long-term management of non-native invasive plant species in the reforestation planting areas and other habitat interfaces. This has included the long-term control of common reed (*Phragmites australis*). The reed grass requires follow-up inspection and spot treatments. The callery pear and other ongoing invasive plant treatments need to continue and should be accelerated if additional resources become available. There needs to be continued vigilance for new plant species of concern, including such problematic species as Oriental bittersweet, porcelain berry, and kudzu. Additionally, there is an over-abundance of common greenbrier in the southern red oak—heath forest. This has likely been influenced by deer browse of other native understory plants resulting in a monoculture in some places. Greenbrier is not a plant that needs to be eliminated (since it provides habitat/forage benefits for some wildlife) but its overall reduction in cover and supplemental planting of other native shrubs and vines is recommended in concert with deer management efforts described below.



Woodland invasive species management
Photo copyright © Biohabitats

Deer Management: Signs of deer browse and rubbing are evident in the Preserve. Anecdotal information indicates that abundant deer within the Preserve are impacting woodland plant communities to varying degrees. The CIB may elect to partner with a research collaborator to study deer densities and impacts to forest vegetation more quantitatively. Other measures to reduce deer impacts include planting a diversity of less palatable woody plant species, the use of deer protection devices (guards, wraps, etc.); and appropriately scaled enclosure fencing (temporary) for some areas of restoration plantings.



Deer contributing to forest impacts
Photo copyright © Biohabitats

Additional Tree Planting: There is an opportunity to plant additional trees in a savannah-like grouping in the north central portion of the site, adjacent to the existing meadow-savannah area. The benefit of this additional planting is to augment the existing area and extend its coverage to help complete a more continuous woodland corridor habitat connection across the entire Preserve from west to east. Additional native plantings may also occur in voids where invasive species are removed, and to bolster forested buffers on the Preserve's wetlands.

Wetland Management

Wetland Buffers: Buffers of at least 100 feet wide should be targeted for all wetlands. Proposed site uses and programs at the Preserve need to be sensitive of wetland buffers, both in the nature of their planned programming and their proposed location. These buffers protect wetlands from physical impacts, help to protect water quality, and provide for additional habitat for various life requisites of wetland and riparian fauna. Any future development of facilities should acknowledge and protect wetland buffers and their important functions.

Wetland Enhancement: Wetland enhancement can take the form of planting additional wetland plants to improve native biodiversity, creation of new wetlands to include forested vernal pools; and restoration of the tidal marshes associated with the western shoreline inlet. Tidal marsh restoration needs more detailed investigation to understand current losses of existing vegetation to open water (herbivory, sediment supply, SLR, etc.), changes in tidal hydrology and water levels.

Invasive Species Spot Control: Phragmites control needs to continue in and around the wetlands on-site. Additional invasive species management should be undertaken in the adjacent buffering woodland habitats and where invasive shrub and vine species occur along disturbed edges and ecotone (transitional area between two different ecosystems) interfaces.



Forested wetland and associated buffer
Photo copyright © Biohabitats

Warm Season Grassland Management

Habitat Maintenance: The extensive grasslands on the east side of the property should continue to be maintained as warm season grassland habitat with the suppression of woody species where they are not desired. This can occur through the continuation of an appropriately-timed annual mowing regime (e.g., very late winter to early April depending on annual weather patterns and on-the-ground conditions). An alternative management measure will be to experiment with more natural controlled-burn fire management that provide benefits to grassland vegetation and soil properties. A key to the use of fire management will be adequate communication and clearance with local fire department authorities and residents, ensuring treatment areas will not affect vehicles on the road (or associated telephone poles and lines), infrastructure, or buildings.

Supplemental Planting: Supplemental grassland plantings can occur in the form of over-seeding in poorly-performing, bare or in areas treated for control of invasive species. Supplemental plantings can include additional native warm season grasses and a variety of native forbs and wildflowers to increase biodiversity and provide pollinator species habitat.

Invasive Species Control: As with all of the on-site habitats native grassland areas need to be monitored for invasive species and spot-treated where they are identified at low densities (e.g., individuals to less than 5% cover) to treat any issues before they become more labor intensive. This includes monitoring and treating not only previously reported invasive pests such as thistles, but being vigilant in identifying the invasion of new non-native invasive species that occur in virtually all ecosystems.



Restored meadow with mown circulation trail - Photo copyright © Jennifer Dowdell

Interpretation

The Preserve provides accessible and intriguing educational opportunities and serves as a conduit for new residents and visitors to support the work of the CIB for the Inland Bays. The educational priorities for the Preserve are 1) the flora and fauna of its aquatic and terrestrial ecosystems, 2) the importance of natural areas, particularly wetlands, to clean water, 3) SLR and 4) the Center for the Inland Bays brand.

Messaging

Educational signage and learning stations should be designed and located to tell the complete story of the Inland Bays as illustrated at the Preserve. From its ecological roots, to its agricultural history, and its current role in restoring and conserving habitat and ecological diversity, the messages delivered at the Preserve should be clear and concise and reinforce the mission and educational objectives of the CIB. Overall, themes should tell the story for floras, fauna, habitats, and ecological- and/or human-influenced pressures. Interpretive messaging should be located throughout the Preserve specifically at key points where some type of ecological or habitat occurrence can be either highlighted or whose broader environmental context can be explained. These should also be coordinated with the CIB's educational objectives and highlighted during docent-led tours.



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Interpretation themes could include:

- **Farming legacy:** It is an important part of the Preserve's landscape history and should be integrated into the story of the landscape, including photos of the landscape at strategic points where visitors can see a window into the past as well as the trajectory of the landscape from farmed land to restored natural resource area.
- **Areas of conservation and programming connections:** The connections include those with the CIB for the Inland Bays.
- **Habitat types:** Various habitats types should be highlighted with additional signage, describing and explaining conservation and restoration practices that support long-term ecological function and success. **Signage should be included for the following:**
 - » Salt marsh (low and high marsh)
 - » Overwash dune grasslands
 - » Loblolly pine and wax myrtle woodlands
 - » Southern red oak/heath forest
 - » Successional maritime forest,
 - » Palustrine forested wetland
 - » Freshwater pond/wetland
 - » Successional forest
 - » Warm season grassland
 - » Meadow
- **Pressures on ecosystems:** Some of the most serious issues facing the Preserve include erosion of the beach and marshes; invasive plants including phragmites which are concentrated in certain locations on-site and could spread if not controlled; deer population growth; and runoff from the adjacent lands.

- **Climate change and SLR:** These could dramatically affect the existing landscape, habitat and coastal patterns currently seen at the site. Strategically placed signage, including graphics and images that show the effects of storm surge, habitat shifts, and the potential for changes in the sea level and loss of land, can help tell a story in a meaningful way. These signs can also serve to highlight the importance of shoreline and marsh protection and restoration, as well as existing wetland preservation.
- **Environmental restoration:** The restoration efforts that the CIB is undertaking region wide should be highlighted where possible at the Preserve and **may include—**
 - » Eelgrass restoration,
 - » Warm season grassland restoration and slough gut tidal marsh, and
 - » Oyster reef restoration.
- **Native wildlife:** The native wildlife that make their homes in the Preserve's habitats help create a sense of place and provide a way for people to have a stronger connection to the Preserve. **Some such native wildlife are—**
 - » Migratory birds,
 - » Horseshoe crabs, and
 - » Mammals

Signage

Signage can help describe how the Preserve fits into the wider context of the Inland Bays and what role it plays in telling the continuing story of the Inland Bays—from early development to today. Some of the current existing signage at the Preserve is tastefully done both in terms of the graphics and well-conceived and written messages. However, they are starting to show signs of age.

As the CIB expands its educational messaging, it will need to add additional message and graphic panels. At that point, it will make sense to evaluate all the panels and complete a redesign of the overall system of panels. It is conceived that several of the existing panels' content and graphics may be repurposed into the new graphic style that is developed for the larger signage system. Signage locations (Refer to Exhibit 9) should be determined with attention to avoiding fragmentation or disturbance of sensitive habitats, and finding locations that provide both long views (across the salt marsh) and focused attention (within the loblolly pine/wax myrtle stand) on key habitat types should be the objective for signage placement.

In addition, appropriate signs need to communicate the Preserve's rules and regulations/policies. For example, the Preserve may want to adopt a policy regarding pets/dogs and displays the rules at the Preserve's entry zone kiosk and nearby dog station and on appropriate signs throughout the Preserve. Several dog stations at key areas could have signs that state that the human companions of pets are responsible cleaning up after their pets and depositing pet feces in provided bags and trash cans (For more information, refer to the Pet Policy section on page 17).

Other signage needs for the Preserve include the development of new entrance signage that should be located at the main entrance off Cedar Neck Road. Trail head markers along Cedar Neck Road as mentioned in an earlier section should be of the same style and materials as the entrance signage and should be designed and fabricated together. Additional signage includes retainage of the exiting welcome kiosk; new trail map; Preserve rules and regulations panel including a stated pet/dog policy; and a possible donor recognition panel.

IMPLEMENTATION AND FUNDING

Implementation

Implementation of the master plan recommendations require additional efforts by the Center toward phasing prioritization, require additional technical and design studies, engineering, further design development, and potentially permitting. As the Center begins the implementation process the services of a variety of professionals may be needed and may include but not be limited to landscape architects, architects, engineers and possibly a construction manager to assist with the management of the overall process. These professionals can assist the Center in realizing the master plan elements with respect to detailed design, construction documentation, permitting and approvals, and construction observation.

Other implementation efforts may be undertaken by the CIB's staff and volunteers and not need the assistance of outside parties. Still other efforts will need to be contracted by outside parties. Phasing the construction of the various master plan elements at the Preserve enables the CIB to make incremental progress toward the realization of this master plan as funding becomes available (Refer to Phasing Diagram Exhibit 10). As with any phased development, certain elements will need to be constructed in sequence, while other items exhibit greater flexibility. Master planning level recommendations for these next steps and some potential sources of implementation funding are provided below. However, phases may be combined or modified based on opportunistic funding opportunities and specific site improvements may be implemented in a variety of sequences. In light of that, the associated Phasing Diagram suggests phased stages versus sequential phasing.

Implementation Phasing (PRELIMINARY)

Implementation of master plan elements and green practices and resource management is proposed on the next page in the following general phases:

Phase

Activities

Phase 1: (1-3 years)	Early action and ongoing management activities
Phase 2: (4-10 years)	Master Plan implementation projects
Phase 3: (4-25+ years)	Long-term maintenance and management
Ongoing	Regular maintenance and management operations

Phase I

- Study the Estuarine Restoration opportunities, particularly shoreline conditions and causes for the beach and marsh outfall system
- Develop of a Climate Change Action Plan for the Preserve, addressing SLR adaptation and coastal resiliency through adaptive management, research, and community education in the Inland Bays.
- Pursue planning, funding acquisition, design, and implementation of an early-action project expanding eelgrass area and techniques and/or an oyster reef pilot demonstration area.
- Implement entrance enhancements, which include expanded parking, bioretention, gateway signage, and restroom facility.
- Implement trail reorganization strategy, which includes trail improvements and removal as well as new trail markers and orientation maps.
- Develop an expanded educational curricula plan that addresses both formal and informal learning at the Preserve as well as capitalizes on science, technology, engineering, and mathematics (STEM) curricula opportunities.
- Implement meadow native landscapes for Meadow-Arboretum area and install arboretum tree plantings

Phase 2

- Undertake an interpretive master plan to replace and add to the existing interpretive panels in the subject areas recommended by this report.
- Develop student education area, which includes new amphitheater, lawn/open space creation, and design and construction of a teaching structure.
- Implement perimeter trails adjacent to arboretum meadow connecting parking area to education area.
- Develop and install ecologically-based interpretive signage or digital media access for all green infrastructure and resource management practices, and include in education programs.
- For all new or improved facility and landscape development projects, model baseline and proposed conditions for stormwater run-off, followed by implementation of integrated low impact development stormwater best management practices (BMPs).
- Implement forest management practices through additional tree planting and deer management (e.g., density study and planting enclosure/protection).
- Implement living shoreline, meadow, and wetland restoration and management efforts.

Phase 3

- Develop a long-term green infrastructure and natural systems adaptive management plan, which measures restoration performance through monitoring.
- Implement long-term adaptive management of green infrastructure and natural systems on the Preserve through partnerships with local or regional stakeholders.
- Provide service-learning and hands-on community stewardship opportunities integrated with youth education programs.
- Collaborate with local or regional higher education institutions on research opportunities, including climate change, SLR and resiliency.
- Share results of above studies and research through publications and workshops.
- Through monitoring efforts, data analysis, and system feedback, modify resource management decisions to reflect changing conditions and targets, and update/supplement the master plan every 5 years to reflect adaptive management findings and decisions.

Ongoing

- Continue spot treatment of invasive species across the Preserve, as well as the expansion of the existing invasive plant management activities in the woodland and meadow management areas
- Provide supplemental plantings and invasive species management and establish wetland buffer zones when portions of the Master Plan are implemented (i.e., new trails, parking, structures and amenities).
- Expand citizen science education and monitoring activities.
- Address information gaps and needs such as—
- A coastal engineering hydrodynamic and sediment transport study of the Preserve shoreline, tidal marsh system outfall, and near-shore environment can inform a feasibility study of alternatives;
- A hydrologic and hydraulic study of pre- and post-development stormwater run-off should be conducted for all new or improved facilities and amenities on the Preserve;
- A deer density and impacts study with a research partner can inform management needs associated with plantings and protection; and
- Site-specific modeling of potential climate change impacts including SLR, considering inundation and predicted habitat shifts as a part of a Climate Action Plan for the Preserve.

Estimated Cost Projections

Costs associated with the development of the Preserve are likely to be significant given the size of the site and the desired amenities. The detailed costs are broken down by phase in Exhibit 11. As mentioned above, a phased approach can break down the magnitude of the costs into smaller more manageable increments. This phased approach will enable the CIB to develop elements within the Preserve in a number of years.

Funding of Resource Management

The CIB's traditional means of donations, volunteer resources, and grant funding pursuits will continue to be the primary means for continuing the legacy of ecological restoration and resource management that has been at the forefront of CIB's activities since the inception of the Preserve.

A range of potential resource management funding can include—

- Habitat restoration and management funding grants through the National Fish and Wildlife Foundation (NFWF), National Oceanic and Atmospheric Administration (NOAA), Delaware Dept. Natural Resources and Environmental Control, and the US Environmental Protection Agency (EPA);
- New and emerging funding streams for climate change resilience, public-private partnerships, community forestry, green infrastructure, fisheries management and environmental literacy; and
- Dedicated donation campaigns for select projects and resource management through donation solicitation, donated goods and services, and offering educational/service credits.

Meeting Minutes

Meeting: James Farm Ecological Preserve-Master Plan Kick-off Meeting

Date: April 9, 2014

Location: Center for the Inland Bays Office, Rehoboth Beach, DE

Attendees: Scott C. Scarfone, ASLA – Oasis Design Group
Mark Haney – Oasis Design Group
Ed Morgereth – Biohabitats
Chris Bason – Center for the Inland Bays
Bob Collins – Center for the Inland Bays
Jennifer Jones – Center for the Inland Bays
E.J. Calabala – Center for the Inland Bays
Sally Boswell – Center for the Inland Bays

Meeting Overview

- Introduction of CIB staff, Oasis and Biohabitats team members;
- Discussion of the general scope of work and the team's proposed work - Chris referenced us to the original RFP for the scope of design items – they still stand. Meeting focused on supporting and clarifying those desires.
- Other general aspects of the plan and basic needs were discussed; including, Increased in 'traffic' visitors anticipated; 5-year lease automatically renewal importance, and collaboration with other stakeholders

General Discussion

- CIB Staff gave overview of their roles related to restoration, education & outreach, development & marketing, Center directives, and James Farm management
- The group discussed what are the user group issues and messages that are to be conveyed (such as birding groups, summer beach users, dog walkers, joggers, etc.)
- What are the target groups for the future – eco-tourists, kayak renters, day camps, other users?
- There currently is no indoor or sheltered space for groups of school children to shelter them from weather
- Discussion of other potential site user groups (organizations with compatible missions, wedding, parties, picnics, and do they want to expand these use opportunities?)

Site habitats and their importance

- Restoration efforts have included reforestation plantings, freshwater wetland/vernal pool creation, wetland restoration of old mosquito tax ditches
- Invasive species management now includes spot treatment every year of Phragmites, and other treated species include callery pear, privet, multiflora rose, and Japanese honeysuckle.

- The shoreline cove is a big issue; Pasture Point is eroding and the wetland is collapsing (need to understand the issues and what is needed); what will happen if nothing is done?
- Loss of shoreline beach is critical to school program activities and citizen science monitoring program for horseshoe crab and inshore fish monitoring

Coastal changes and resilience

- Doug Miller, College of Marine Science, UDEL has done studies of erosion on Pasture Point; and other studies have been done on groundwater nutrient upwelling, horseshoe crabs & eelgrass
- Identifying the major issue of shoreline erosion, articulate why the beach is so important to the Preserve, frame the needs, opportunities, and what further level of studies will need to be done
- Part of the plan work is to identify where the beach area may migrate to based on sea level rise and erosion (relying on existing SLR projection mapping data).

Other Plan Aspects

- A copy of the existing trail map is needed by the planning team; it was indicated that there is not a digital map but an intern project GPS points file may be available (to be provided?)
- There are opportunities for interpreting the restoration work that has been done – e.g., an existing reforestation work kiosk, warm season grass habitat restoration, and
- Other interpretive and learning opportunities include highlighting examples of native wildflower meadows appropriate to the watershed for use elsewhere

Plan Development Process

- The planning work between Oasis and Biohabitats will give a snapshot of what out there now on the Preserve and acknowledging the ecological importance of the habitats
- The assessment work will include diagrams of trail analysis, natural community features, and site amenities; Oasis and Biohabitats will have a team work session meeting
- Public Meeting and a separate programming meeting with the CIB are proposed for the same trip in May; the Public Meeting will show diagrams, discuss process and facilitate discussion
- The last part is putting together the plan; it will include the analyses, formulation of the Master Plan graphics, recommendations/write-ups and recommendations & next steps
- Approval review of the Master Plan will include Center staff, the National Estuary Program, County Council members (?), funders/grantors, and the Board of Directors.

ACTIONS - Ideas for the Center to Explore/Provide Additional Feedback

- As per below... any deed restrictions or factors that may want to make you renegotiate the terms of your lease/agreement with the County. Restrooms key... can we do composting toilets? These are very efficient, safe, and clean. The National Park Services is adopting these in many of their parks. How about any further deed restrictions for structures... mainly pavilions. Obviously one already exists. Can there be more?

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CIB 4/23/14 Response:

- a. No deed restrictions on structures-- outside of commercial or residential buildings.
 - b. There may be a question about composting toilets due to the deed. I believe any question would be due to misinterpretation of the intent of the language. It will be up to the County and I'm (Chris Bason) 95% confident they will approve of the toilet.
- Education..... more discussion internally needed here and in preparation for our next meeting on May 22:
 - a. What additional types of school programs might you have at the Farm? What types of things will be taught?
 - b. What will be the size of the various groups coming during the school trips?
 - c. What types of informal messaging would you like to communicate at the farm e.g. interpretive messages/panels. I'd like to have an inventory of the existing signs out there. what do we want to add to that? P.S. the graphics are very well done. No need to change that... keep going with the format that has already been established.
 - Development/stakeholders – who might you want to have participate in the May 22 workshop? Once that list has been developed then you should work on getting the message out through your various communication channels.... for important people a personal invite would be the best path toward that.
 - Determine if access to the 'rear' of the preserve can be obtained off Caroline Street/Raccoon Road. We had talked about that in the field and would like to explore the possibility of having the service yard and access in that western corner of the site. You or Bob mentioned that you could run that idea by the property owner... who, by the way, should be invited personally to the workshop on the 22nd.

CIB 4/23/14 Response: According to Brett Cox, owner of the trailer park, those are private roads. Scott, after discussing this option of a facilities area accessible via this road, we had very little confidence that this would work. Because the road is private and the owners are very particular and because other trailer parks in the area were sold for redevelopment we feel that this approach would be too risky for investment.

Next Meeting: May 22nd, 2014. Topics:

- Educational Messaging Workshop
- Public Workshop
 - Analysis Presentation
 - Community Listening Session

Final Presentation: July 18th, 2014

**Meeting minutes compiled by Ed Morgereth/ Scott Scarfone*

Meeting Minutes

Meeting: James Farm Ecological Preserve-Education Objectives/Public Meeting

Date: May 22, 2014

Location: Center for the Inland Bays Office, Rehoboth Beach, DE

Attendees: Scott C. Scarfone, ASLA – Oasis Design Group
Chris Bason – Center for the Inland Bays
Bob Collins – Center for the Inland Bays
Sally Boswell – Center for the Inland Bays

Meeting Overview

- Second meeting between Oasis Design Group and Center for the Inland Bays
- Presentation of Oasis Design Group and Biohabitat's analysis studies and diagrams of the James Farm property.
- Discussion of topics not fully clarified during the kick-off meeting; including, educational objectives, trail alterations and entrance definitions, signage concerns, dog-waste strategies, and better entry sequence.

General Discussion

- Formal and informal opportunities.
- Need better introduction on what one can see at farm, e.g. which trail takes you to see what?
 - Name trails
 - Preliminary trails (interpretation)*
 - Secondary trails(no interpretation)*
 - *Needs defined better at entrance.
- Cleaner trail head delineation
- Better introductory signage at entrance

Educational Objectives

We identified major categories to be highlighted with appropriate signage. It was noted that the current signage will ultimately need to be replaced with need signage that whose family of design and messages encompass all of the signage topics noted above. ***A follow-up comprehensive signage master plan will need to be developed*** that identified signage graphics, signage locations, imagery, and text.

- Grassland
 - Birds
 - Scarcity of Habitats
 - Grasses

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- Slough's Gut Restoration
 - Grassland Restoration
- Freshwater Wetland
 - Clean Water
- Salt Marsh
 - High Marsh
 - Low Marsh
- Succession
- Forests
 - Mixed
 - Maritime
 - Forested Wetland
- Bay Habitat
 - Nutrients
 - Fertilizer implications
- Migratory Birds
- Horseshoe Crabs
- Sea-Level Rise
- Native Plants

Trail Marker Signs

- Nice design. Add more in key locations

Public Meeting

A public meeting was held from 5-67 PM at the Bethany Beach public library. Approximately 45 people showed up to express their opinions. The following comments were captured.

- Educate on impact of bay pollutants
- Security cameras at parking lot
- Lighting at structures (photovoltaic's)
- Fence at Bayshore mobile home park border
- Zip lines
- Delineate use policy
 - Dogs
 - Bikes from Bayshore mobile home park
- Create seating areas with tables
- Signage for sunrise to sunset
- Signs for dog 'poop'
- Signs for no smoking
- Community gardens
- Deer management – deer seen on nearby roads

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- Like of ecological purpose, not ‘activities’, e.g. dogs and beach use
- Separate education from maintenance
- Non-accessible areas – Protected Zones
- Dog Restrictions
 - Leashes
 - No-Go Times
 - Dog Days
 - Trails only dogs
 - Hours of Day
- More ‘Bob’ funding – Full time staff on site
- Boat traffic in summer in eel grass and oyster areas
- Use existing red trail to access ‘old’ new maintenance area near Bayshore mobile home park. Bob
- Watch hickory vs holly/black cherry habitat.
- Children’s area at front of garden
- Building or headquarters on location? Or more shelter at entrance?
- Name Issue – James Farm?
- Image of beach at entrance
- Sea-rise ‘markers’? – Projected rise.

Final Presentation: July 18th, 2014 Time TBD

**Meeting minutes compiled by Scott Scarfone*

Meeting Minutes

Meeting: Security and Safety at the James Farm Ecological Preserve

Date: August 19, 2014

Location: Under the pavilion at the James Farm Ecological Preserve, Rehoboth Beach, DE

Attendees: Chris Bason, Executive Director, Center for the Inland Bays
Bob Collins, Property Manager of the James Farm Ecological Preserve
Brett Cox, Owner, Bayshore Marina and Campground
Patti Deptula, Director of Special Projects, Sussex County Engineering Department
Ron Gray, Delaware House of Representatives
Gerald Hocker, Delaware Senate
Captain Sean Moriarty, Delaware State Police
Diane Turner, Owner, High Point Farm

Also invited but not attending were Lisa Daisey of Ecobay Kayak (eco-tourism concessionaire), Jodi McLaughlin (preserve user and DNREC volunteer) and Chief Ken McLaughlin (Ocean View Police Department).

Prepared by: DCIB

The Delaware Center for the Inland Bays manages the James Farm Ecological Preserve for Sussex County. As part of a master planning exercise, a public meeting was held May 22, 2014, at the South Coastal Library. At that meeting, numerous stakeholders identified safety and security at the facility to be a concern. Also, Diane Turner, whose property abuts the JFEP, and who was unable to attend the meeting, voiced similar concerns.

Discussion of the problems identified several areas of security concern. These included night time use of the beach and parking lot that included vandalism, loud music, alcohol and drug use. It was noted that on various occasions, police, via the “911” system, were called and there appeared to be no response.

It was noted that the policy of the James Farm is that it is closed from dusk until dawn, with some exceptions. Signs stating this are posted in various locations. Copies of facility rules (attached) were distributed to meeting participants.

Captain Moriarty gave a brief characterization of state police patrol of the locality. This included how state police respond, how local police (Ocean View Police) reinforce the DSP, that enforcement on-water is conducted by DNREC/ Fish and Wildlife Enforcement. He thus characterized the need for “education” of the DSP, F&W, the 911 call operators, etc. He indicated that he would start discussion with these entities immediately. It was noted that the “Google” GPS system directs users to the Bayshore Marina address of Caroline and Raccoon Streets, not the James Farm parking lot. Captain Moriarty also noted that, if the 911 system operator does not or cannot adequately respond to the situation, persons should call Troop 4 of the Delaware State Police at (302) 856-5850. Senator Hocker noted that that the Ocean View Police Department cannot respond to the James Farm unless the call goes through the 911 system or the DSP system.

Captain Moriarty also discussed community watch type programs under the purview of Corporal George Camacho of the DSP. A community crime prevention program (ie "park watch") would train various facility users and stakeholders how to assist law enforcement, thus becoming "eyes-and-ears".

Other discussion of various tools that had application at the JFEP included:

- Video cameras/ deer cameras and the like
- Signage; also, consider the color of the signage to make it more conspicuous
- Motion-activated lighting
- Regular staff and law enforcement presence

After the meeting, the west side of the property (Red Trail, Beach and Orange Trail) was walked by Captain Moriarty, Ms. Deptula and Mr. Collins.

Action items:

Captain Moriarty contacted Chief Robert Lecates of DNREC Enforcement on May 19th via e-mail to inform him of the meeting and to request assistance with regard to on-water patrols. He copied several law enforcement persons in this communication.

Captain Moriarty will contact Corporal George Camacho about a community/ park crime prevention program.

Chris Bason will contact Division of Fish and Wildlife Director to educate about water access and request assistance in enforcing closed hours.

Sally Boswell and Bob Collins of CIB will make electronic contact with Google to correct Google address.

Bob Collins will contact Corporal Camacho to coordinate initiation of the community/ park crime prevention program prior to August 31st.

Bob Collins will initiate research into electronic monitoring and safety items such as cameras, motion detection lights. He will present detailed findings to Chris Bason for inclusion in the Master Plan by September 15th.

Bob Collins will make discussion of the signage (color, verbiage, location, etc.) an action item during the community crime/ park crime prevention planning process.

List of Exhibits

- 1 Vegetation Communities, Landscape Ecology and Connections
- 2 Ecological Pressures, Constraints, and Opportunities
- 3 Sea Level Rise Scenario
- 4 Gateway Concept A
- 5 Gateway Concept B
- 6 Beach Access and Maintenance Facilities
- 7 Trail System
- 8 Master Plan
- 9 Signage Diagram - Entrance
- 10 Signage Diagram - Full Site
- 11 Phasing Diagram - Entrance
- 12 Phasing Diagram - Full Site



Exhibit I
Vegetation Communities, Landscape Ecology and Connections
James Farm Ecological Preserve
Ocean View, DE

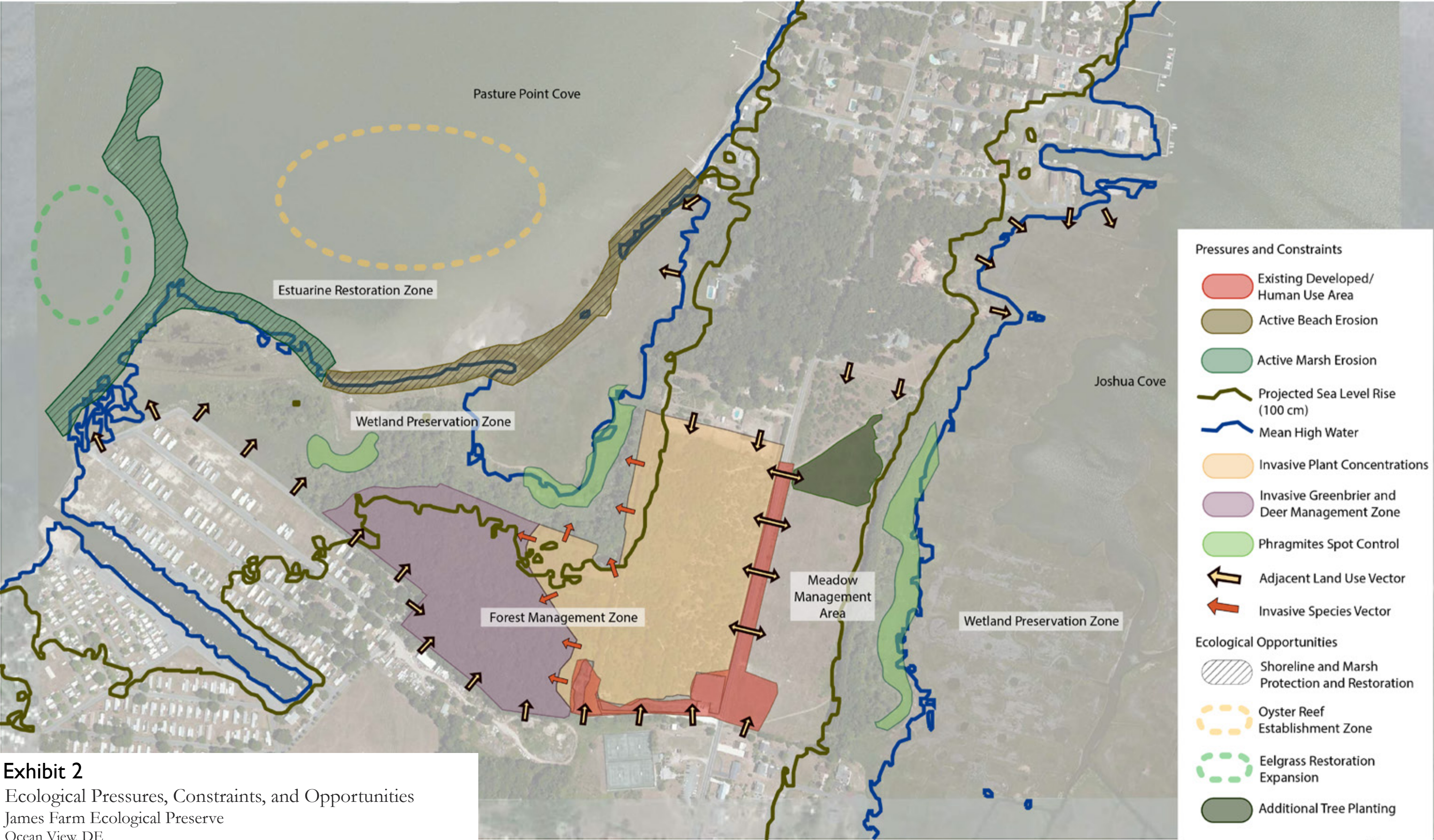
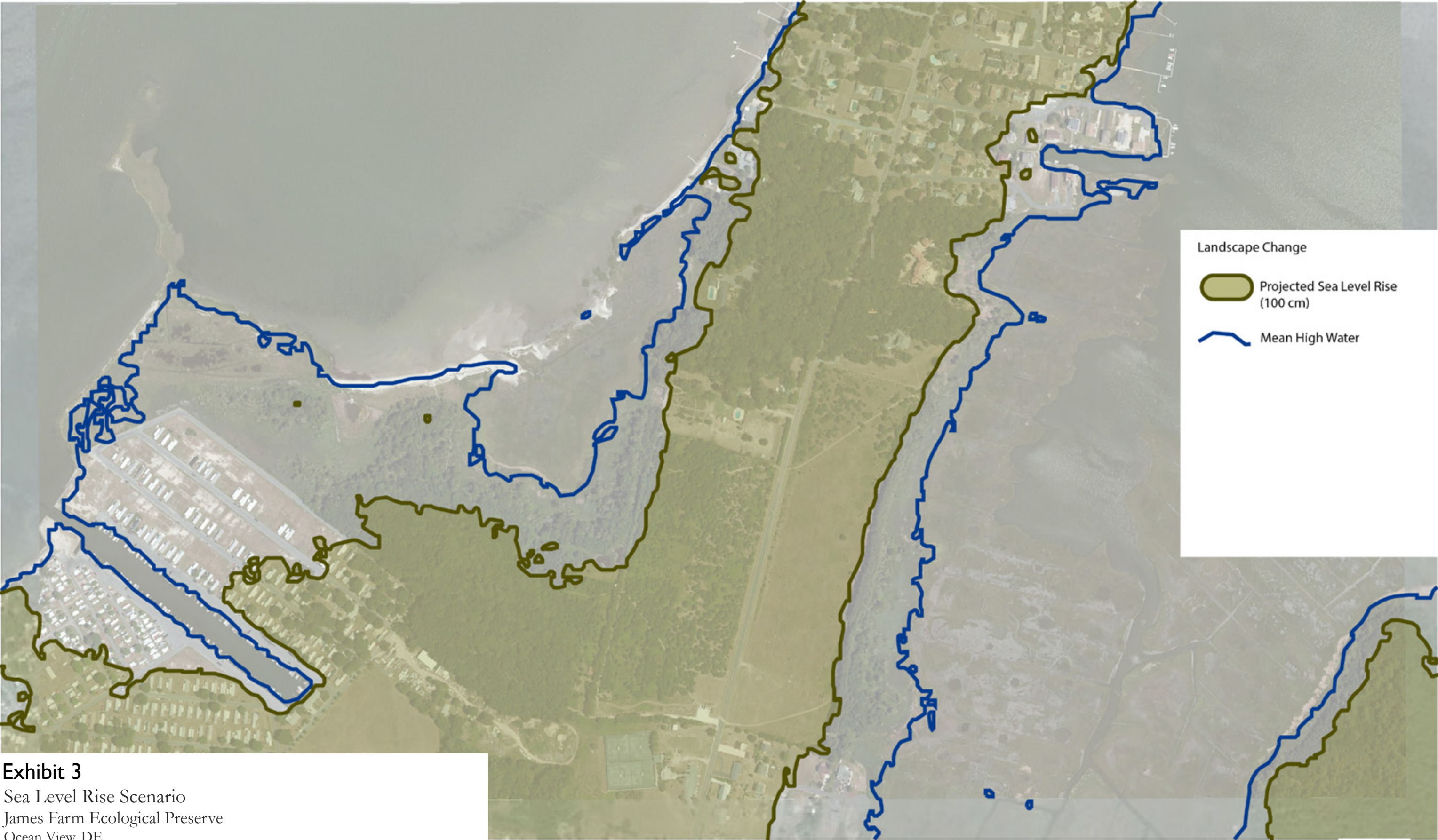



Exhibit 2
Ecological Pressures, Constraints, and Opportunities
James Farm Ecological Preserve
Ocean View, DE



Landscape Change

 Projected Sea Level Rise (100 cm)


 Mean High Water

Exhibit 3
Sea Level Rise Scenario
James Farm Ecological Preserve
Ocean View, DE



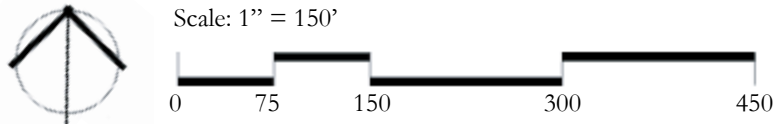
Exhibit 4

Gateway Concept A
James Farm Ecological Preserve
Ocean View, DE



Exhibit 5
 Gateway Concept B
 James Farm Ecological Preserve
 Ocean View, DE

Alternate Maintenance Facility



Beach Concept

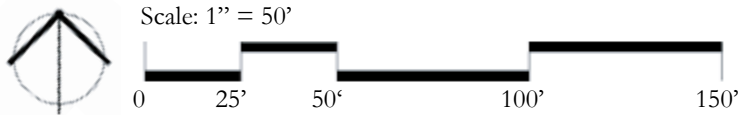


Exhibit 6
Beach Access and Maintenance Facilities
James Farm Ecological Preserve
Ocean View, DE



Exhibit 7
Trail System
James Farm Ecological Preserve
Ocean View, DE

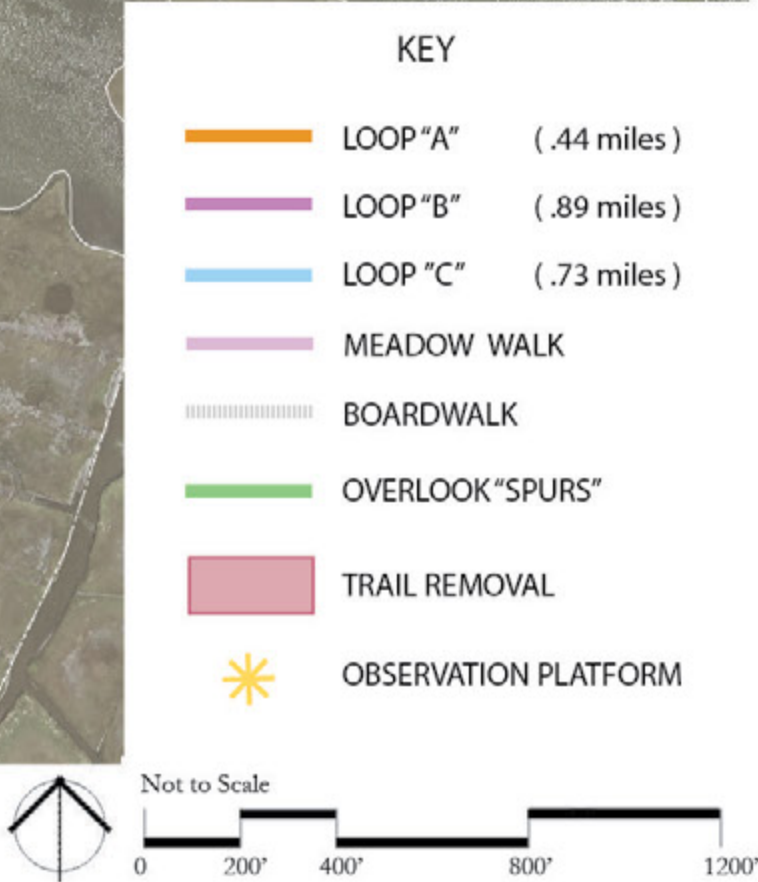




Exhibit 8
Master Plan
James Farm Ecological Preserve
Ocean View, DE



Exhibit 9
Signage Diagram - Entrance
James Farm Ecological Preserve
Ocean View, DE



Exhibit 10
 Signage Diagram - Full Site
 James Farm Ecological Preserve
 Ocean View, DE

TRAIL REMOVAL



Exhibit I I
Phasing Diagram - Entrance
James Farm Ecological Preserve
Ocean View, DE



Exhibit 12
Phasing Diagram - Full Site
James Farm Ecological Preserve
Ocean View, DE

TRAIL REMOVAL

