Agenda – Glacken Slope Phase 6

- Glacken Slope Overview – Previous Phases
- Site Context and Project Goals
- Natural Features Inventory
- Concept Plan
- Fence Alignment Alternatives
- Restoration Timeline

Glacken Slope Restoration - Overview of Phases 1-5

PHASES 1 AND 2 (2009-2010)

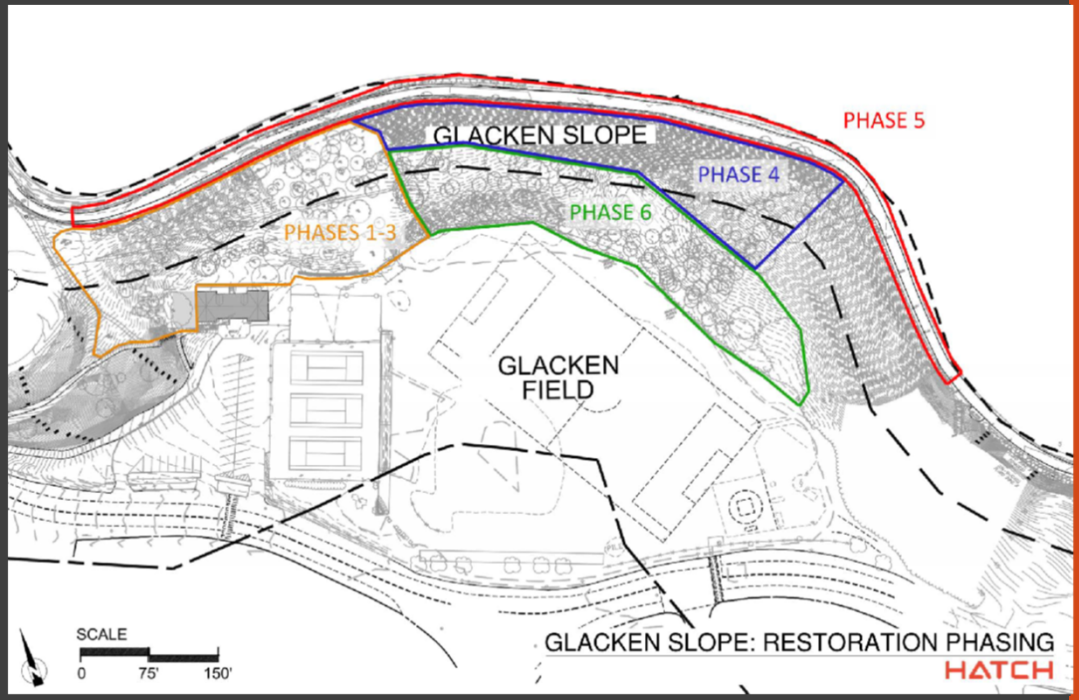
- Stormwater Improvements at FPGC Clubhouse/Top of Slope

PHASE 3 and 4 (2011-14)

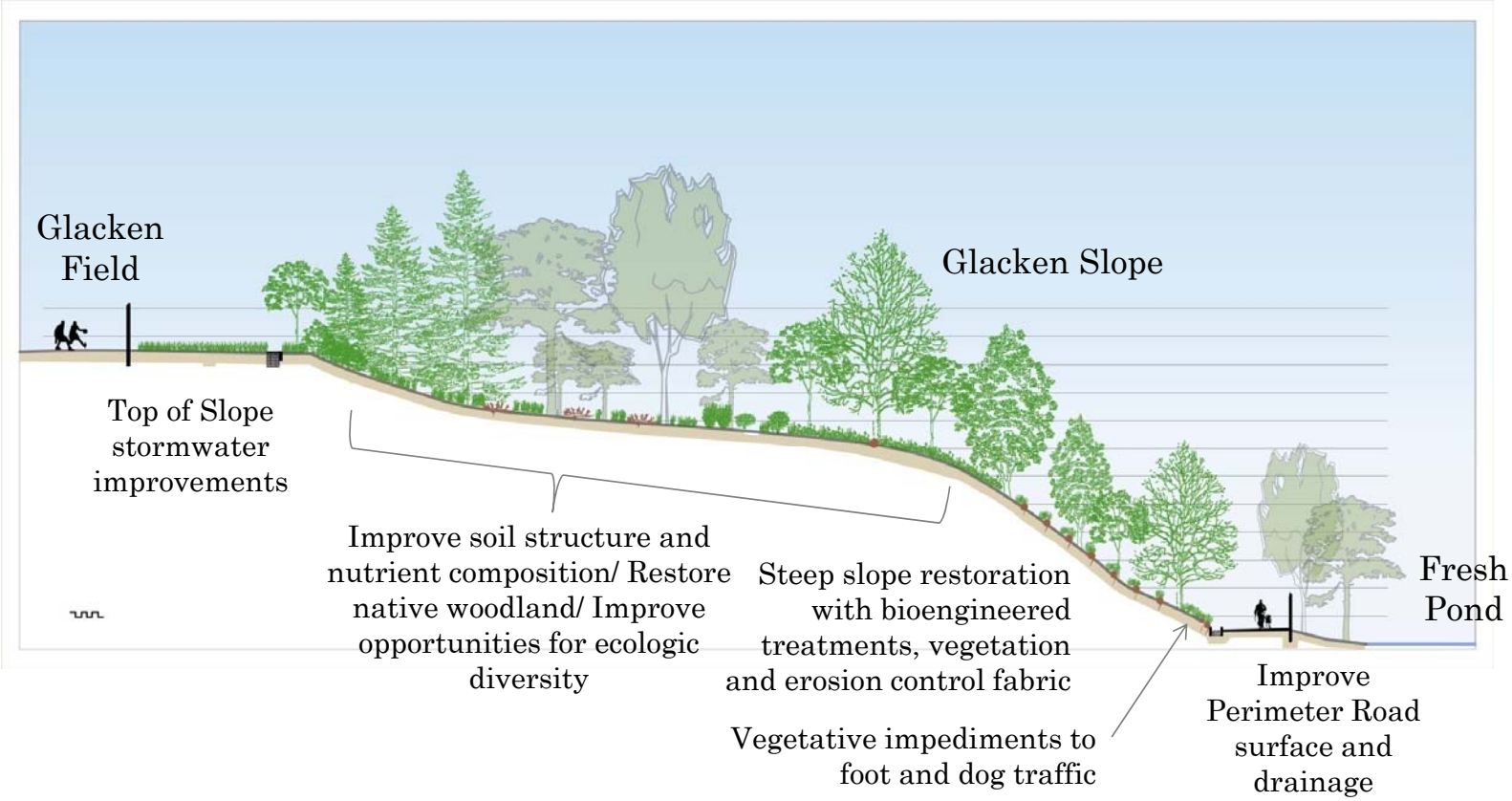
- "Death Slope" (temporary); steepest sections (west)

PHASE 5 (2017)

- Perimeter Road Drainage Improvements



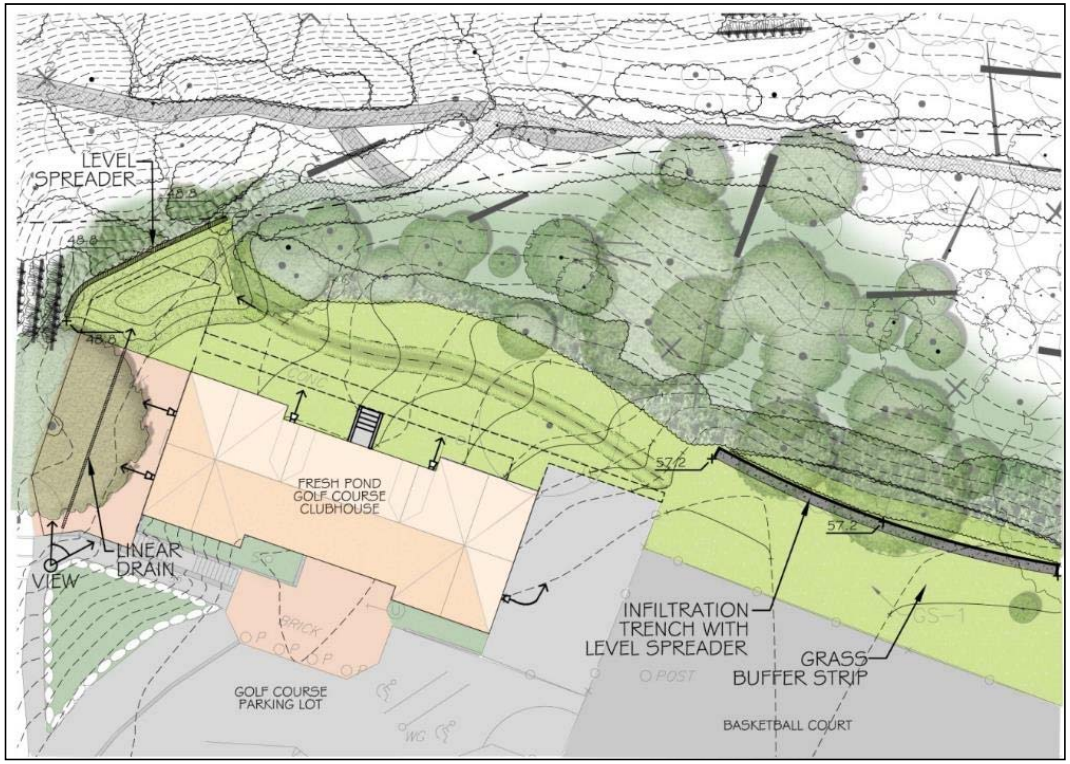
Glacken Slope Restoration - Overview of Phases 1-5



Slope Restoration (Phase 1)

Design Elements

- Remove Degraded Concrete Walkway
- Redirect downspouts towards infiltration BMPs
- Water Quality Swale
- Rain Garden with Underdrain and Level Spreader
- Resurface patio with Porous Paving
- Infiltration Trench with Level Spreader



Slope Restoration (Phase 1)

Slope Restoration (Phases 2 thru 4)

Slope Stabilization

Gully Repair

Woodland Soil Amendments

Trail Closures

Invasive Species Removal

Restoration Plantings

Slope Restoration (Phase 5)

Drainage Improvements to Perimeter Road

1. Cobble Swale
2. Porous Bituminous Concrete Perimeter Road

Improve Views of Fresh Pond / New Fence

Restoration Plantings

Slope Restoration Goals

1. Mitigate stormwater runoff from athletic fields
2. Improve habitat and protect water quality of Fresh Pond
3. Minimize compaction and erosion due to increased foot traffic
4. Restore forest floor soil matrix
5. Restore steeper slopes and repair gullies
6. Restore natural plant community

Site Inventory - Slopes

1. Three Categories:
   - 0 to 5%
   - 5 - 33%
   - 33% and steeper
2. Historic erosion / gullies
3. Less stable / loose material
4. Urban Fill soils

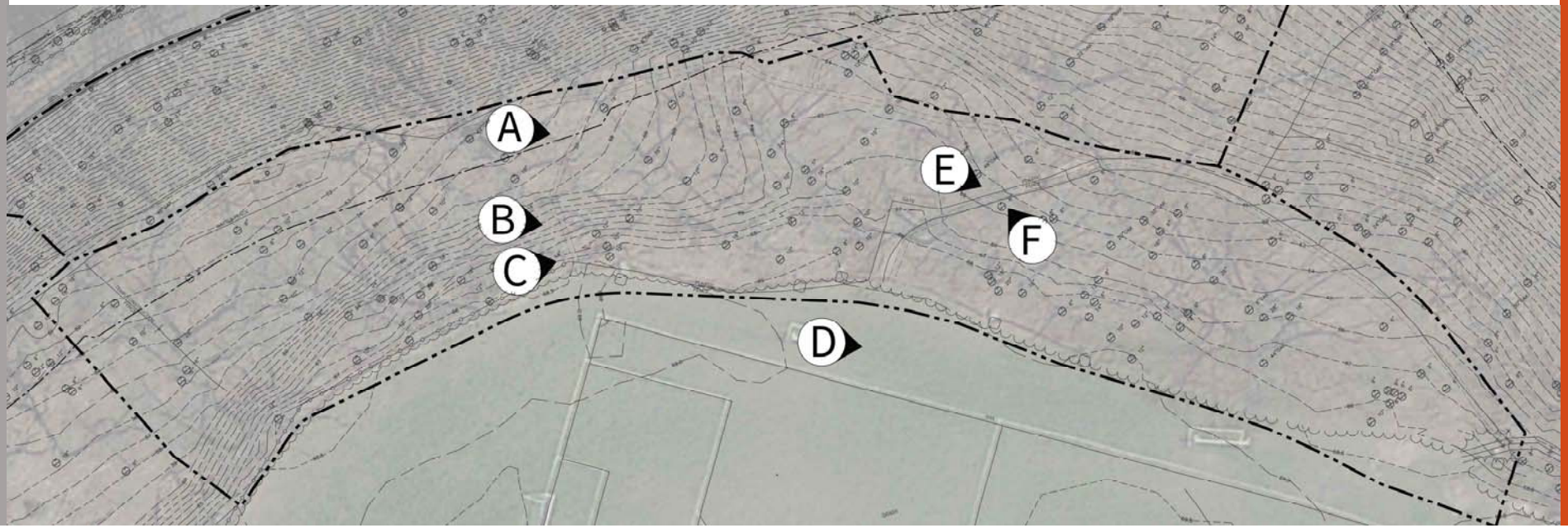
Site Inventory - Slopes

Site Inventory - Soils

1. Characterization
   - ✓ Loamy sand (Urban Fill) on slopes, pH up to 8
   - ✓ Sandy loam (shallower slopes), pH as low as 4.5
1. Soil Testing:
   - ✓ Physical and Chemical Properties
   - ✓ Biological Properties
   - ✓ Compaction

Soil Sampling Locations

A. Physical & Chemical, Compaction
B. Physical & Chemical
C. Physical & Chemical, Biological
D. Compaction
E. Biological
F. Compaction



Soils Inventory – Microbiological

Complete Foodweb Analysis, 2 Areas:

1. **Locust Grove (slope)**
   - **Bacteria and fungal feeding Nematodes and Protozoa Low – need to replenish**
   - **Mycorrhizal colonization High**
   - **pH 6.6**
2. **Oak Grove (flat area)**
   - **Bacteria-feeding nematodes Low – need to replenish**
   - **Beneficial fungal-feeding biomass Low – need to replenish**
   - **Mycorrhizal colonization High**
   - **pH 4.5**
   - **Re-sample at 18” depth**

Soils Inventory – Compaction

Pocket Soil Penetrometer:

1. **Measures Compressive Strength (Tons/Sq. Ft)**
2. **Locations (3):** — **Reading (ave.):**
   - **Athletic Field (turf)** — **0.09 (very soft)**
   - **Forest Floor (flat)** — **0.10 (very soft)**
   - **Woodland Trail** — **0.20 (firm)**

Site Inventory - Vegetation

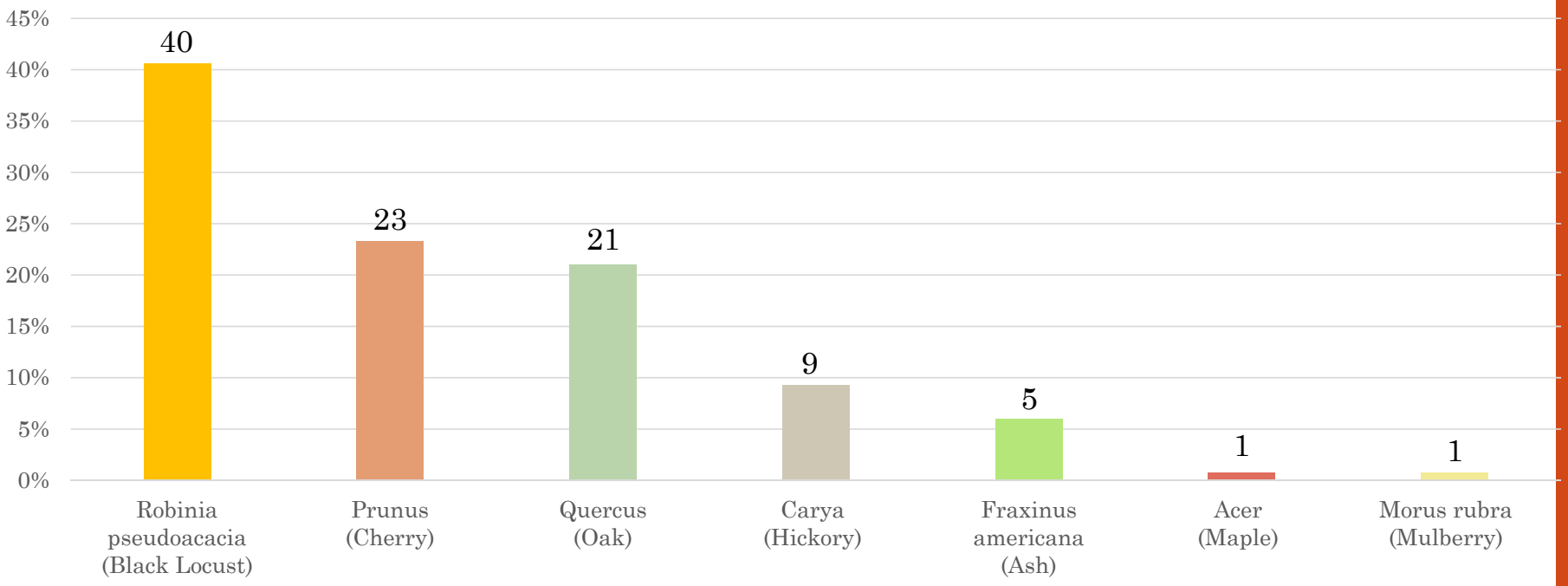
1. Natural Community Type – Oak Hickory Forest
2. Forest Composition – closed canopy & mid successional
3. Well-drained sites
4. Open Understory – only invasives
5. Invasive Community – trees, shrubs and groundcovers
6. Tree Permit required for tree removals 8” cal. and greater

Site Inventory - Vegetation

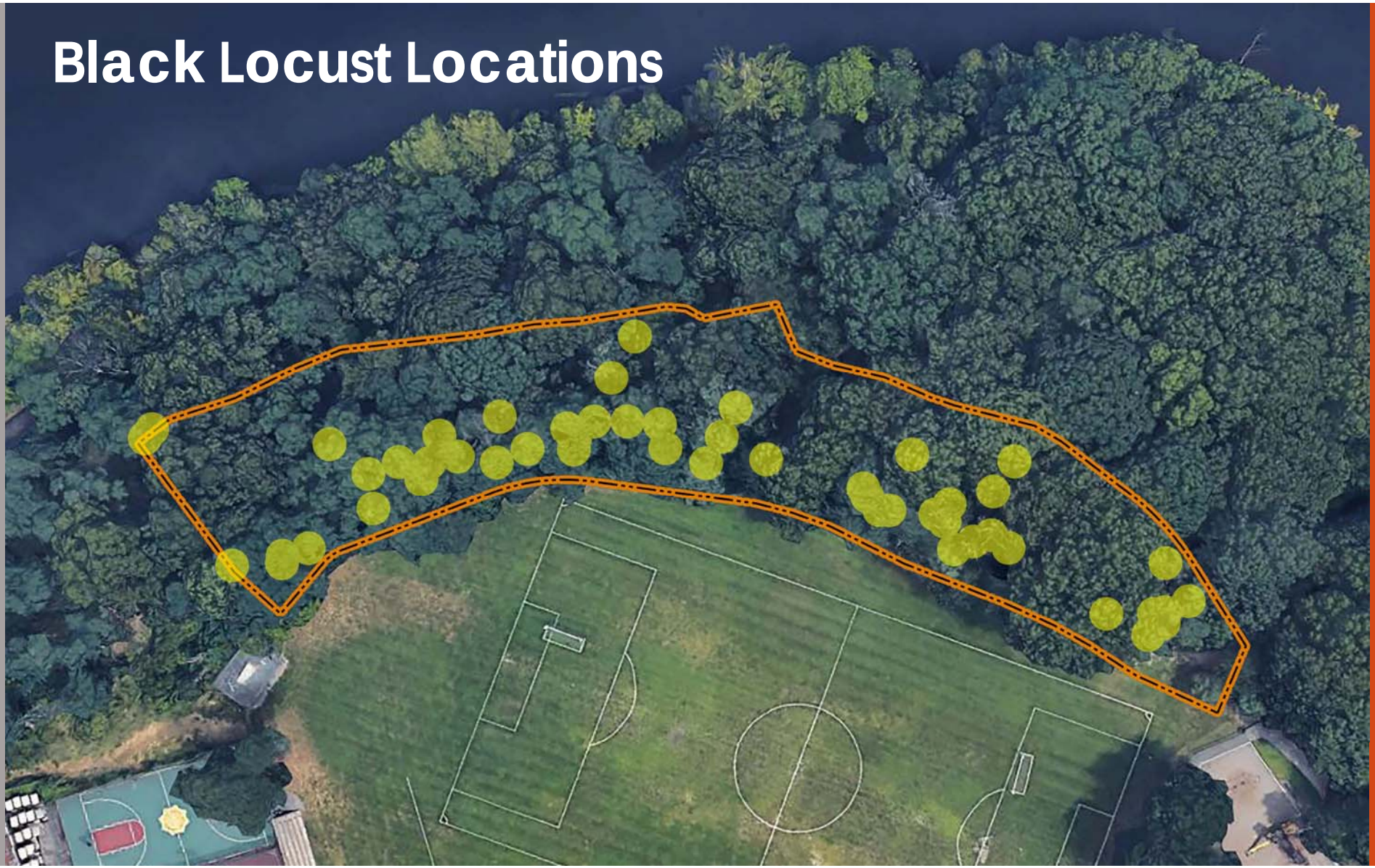
Canopy Trees 6” cal. and greater (133 total)

1. *Quercus spp.* (red/white oak) - 28
2. *Carya ovata* (shagbark hickory) - 12
3. *Prunus serotina* (black cherry) - 31
4. *Fraxinus americana* (white ash) - 6
5. Acer saccharum (sugar maple) - 1
6. *Morus rubra* (mulberry) - 1
7. *Robinia pseudoacacia* (black locust) - 54

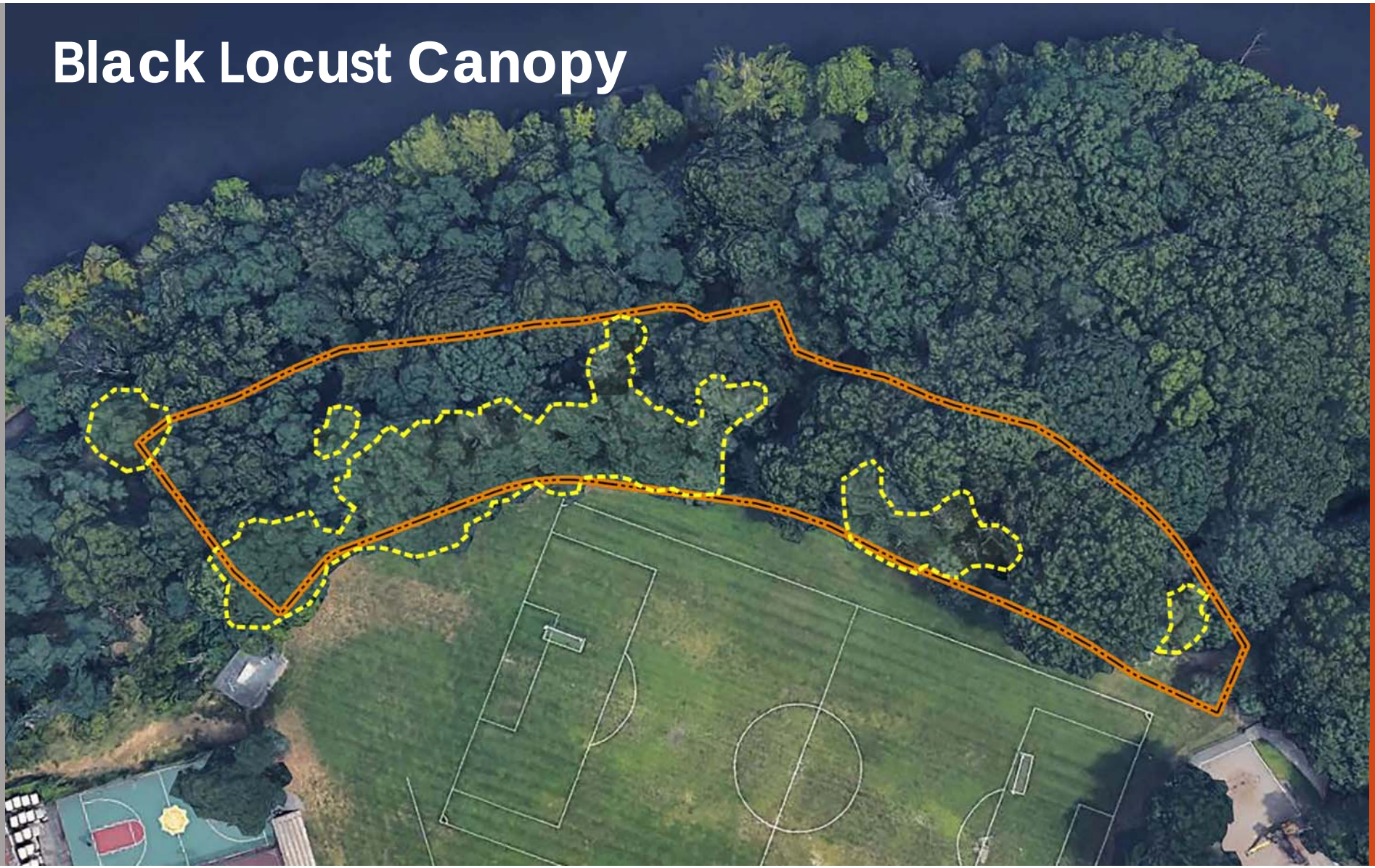
Forest Composition (Trees >6” caliper)



Black Locust Locations



Black Locust Canopy



Black Locust Characteristics

1. Legume family and N-fixer
2. Source of bee nectar
3. MA-listed invasive plant, non-native
4. Clonal growth/dense shade limit native plant competition
5. Secretes allelopathic chemicals
6. Excess N input into soil reduces plant diversity & soil carbon storage
7. 8” caliper and greater (46); 6” to 8”caliper (8) – 54 total

Invasive Species – Other

Understory Trees and Shrubs

1. *Rhamnus sp.* (buckthorn)
2. *Rosa multiflora* (multiflora rose)
3. *Euonymus alatus* (burning bush)

Groundcovers and Vines

1. *Ficaria verna* (lesser celandine)
2. *Alliaria petiolata* (garlic mustard)
3. *Toxicodendron radicans* (poison ivy)

Woodland Restoration (Slope)

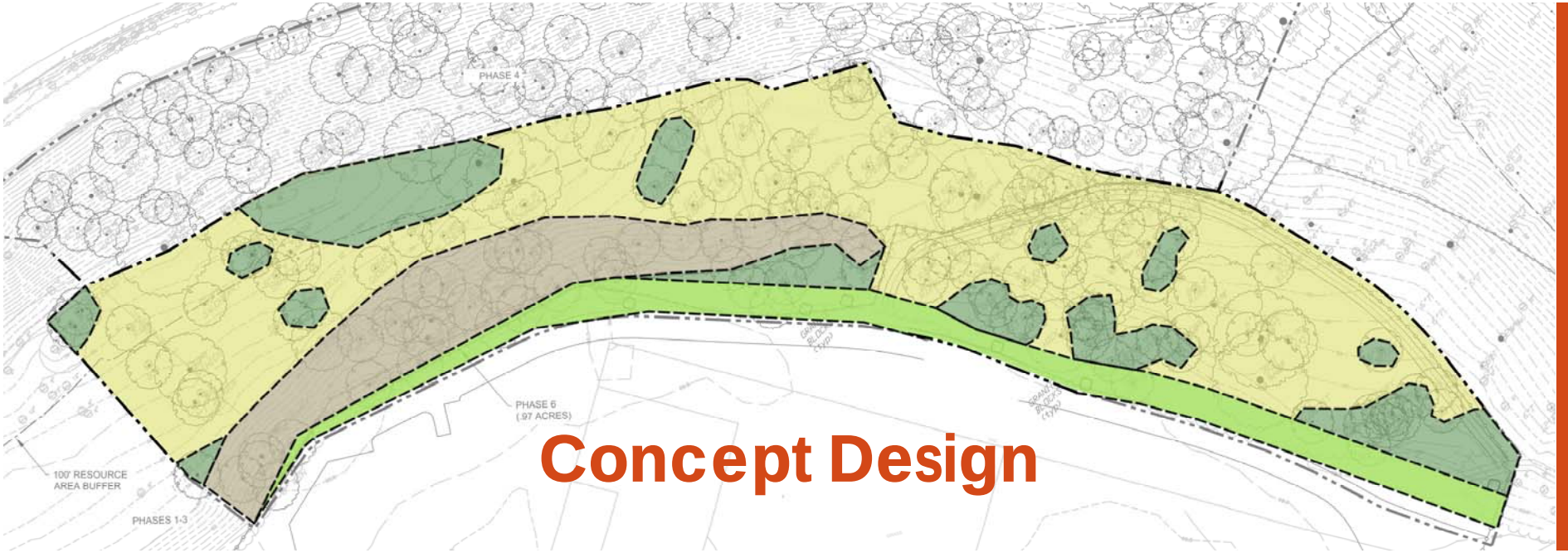
- *Invasive removals*
- *Debris removal (>1” dia.)*
- *Leaf compost amendment*
- *Gully repair & slope breaks*
- *Tree and understory planting*

Woodland Restoration (Edge)

- *Decompaction (select areas)*
- *Invasive removals*
- *Leaf compost amendment*
- *Woodland Edge planting*

Woodland Restoration (Canopy) (Understory)

- *Decompaction (select areas)*
- *Invasive removals*
- *Debris removal (>1” dia.)*
- *Leaf compost amendment*
- *Tree and understory planting*



Concept Design

Proposed Planting – Canopy Trees

1. ***Fagus grandifolia*** (American beech)
2. ***Pinus strobus*** (white pine)
3. ***Carya tomentosa*** (mockernut hickory)
4. ***Carya glabra*** (pignut hickory)
5. ***Betula lenta*** (black birch)
6. **Existing native trees pre-existing within Phase 6.**

Proposed Planting - Understory Trees and Shrubs

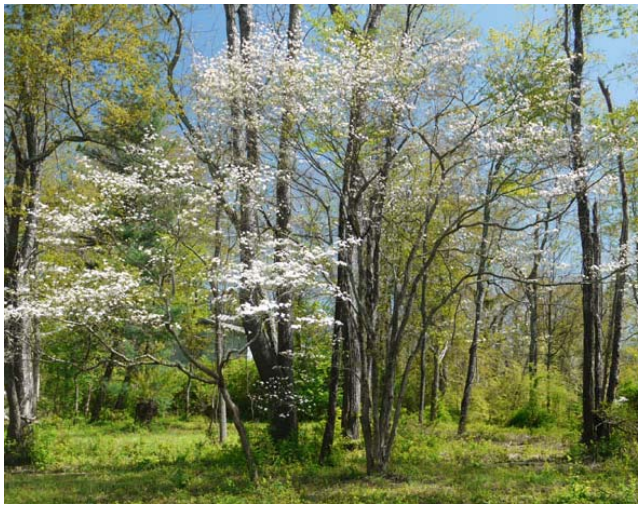
1. ***Ostrya virginiana*** (hophornbeam)
2. ***Betula alleghaniensis*** (yellow birch)
3. ***Hamamelis virginiana*** (witchhazel)
4. ***Cornus florida*** (flowering dogwood)
5. ***Corylus cornuta*** (beaked hazelnut)
6. ***Cornus racemosa*** (gray dogwood)
7. ***Viburnum acerifolium*** (maple-leaved viburnum)
8. **Existing native understory species pre-existing within Phase 6.**

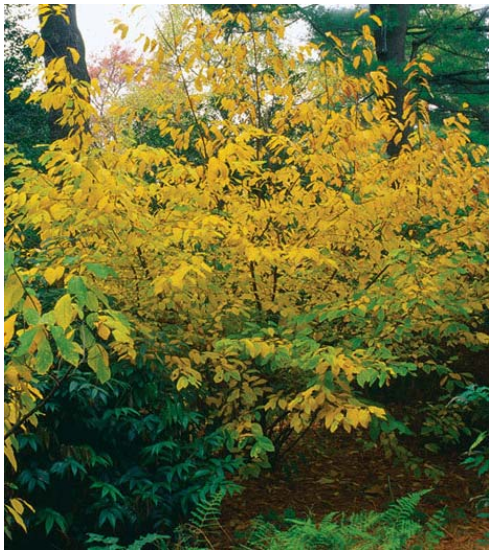
Proposed Planting - Groundcovers

1. **Carex pennsylvanica** (Pennsylvania sedge)
2. ***Tiarella cordifolia*** (foamflower)
3. ***Asarum canadensis*** (Canadian wild ginger)
4. **Eurybia divaricata** (white wood aster)
5. ***Dryopteris marginalis*** (marginal woodfern)
6. ***Pteridium aquilinum*** (bracken fern)

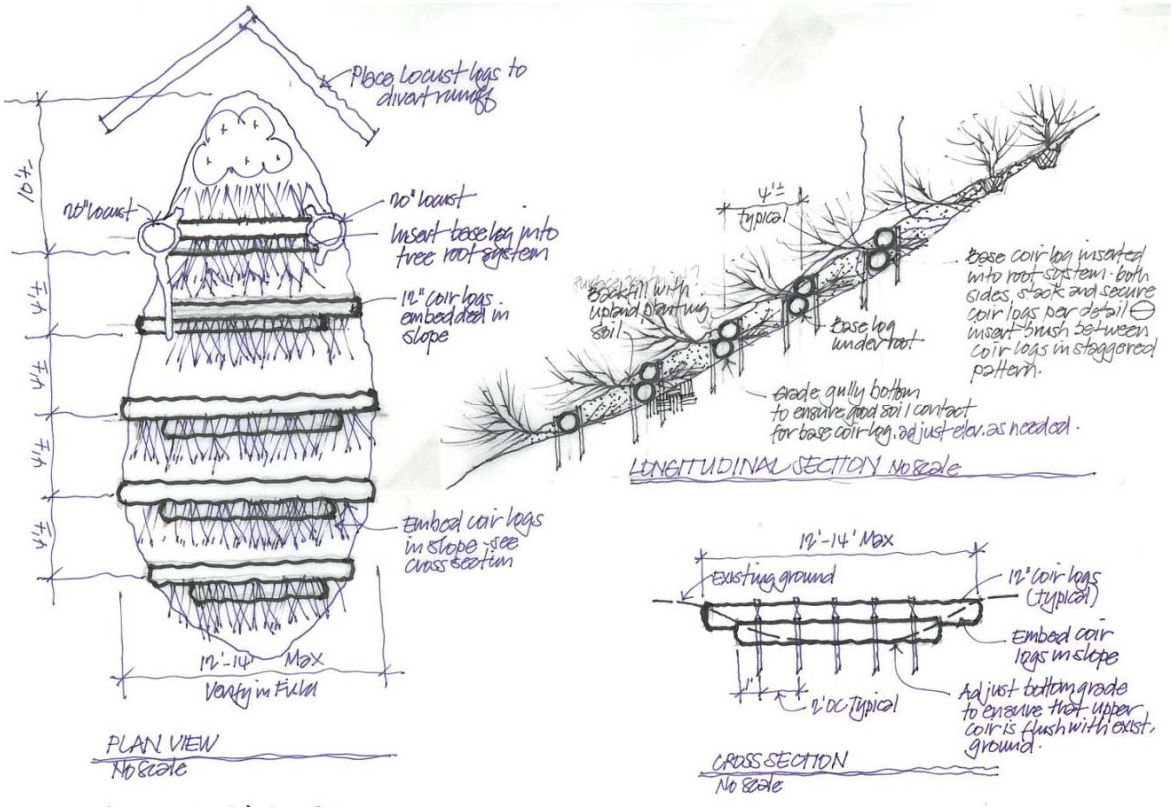
Proposed Planting – Woodland Edge

1. ***Cornus florida*** (flowering dogwood)
2. ***Lindera benzoin*** (spicebush)
3. ***Cornus racemosa*** (gray dogwood)
4. ***Viburnum dentatum*** (arrowwood)
5. ***Dennstaedtia punctilobula*** (Hay-scented fern)

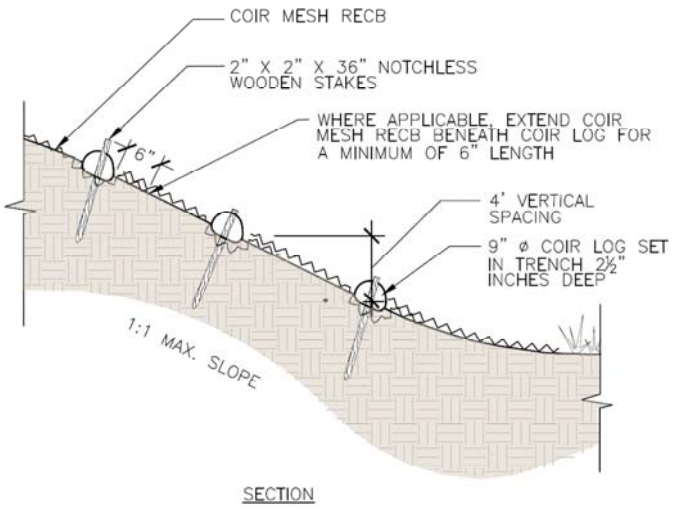




Slope and Gully Stabilization



Gully Repair – Typical Detail



Slope Break – Typical Detail

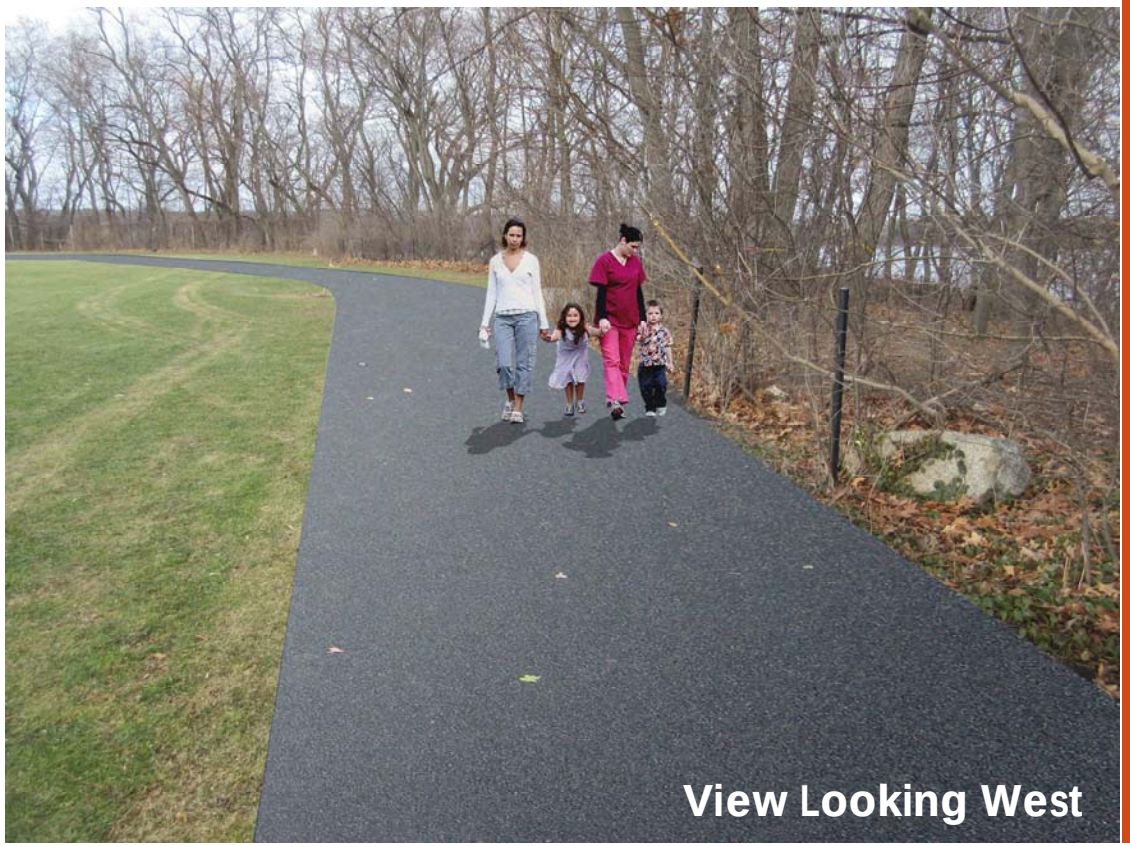
Fresh Pond Vista

Olmsted Plan for Concourse Overlook (circa early 1900's)

Proposed Path Alignment

All Alternatives

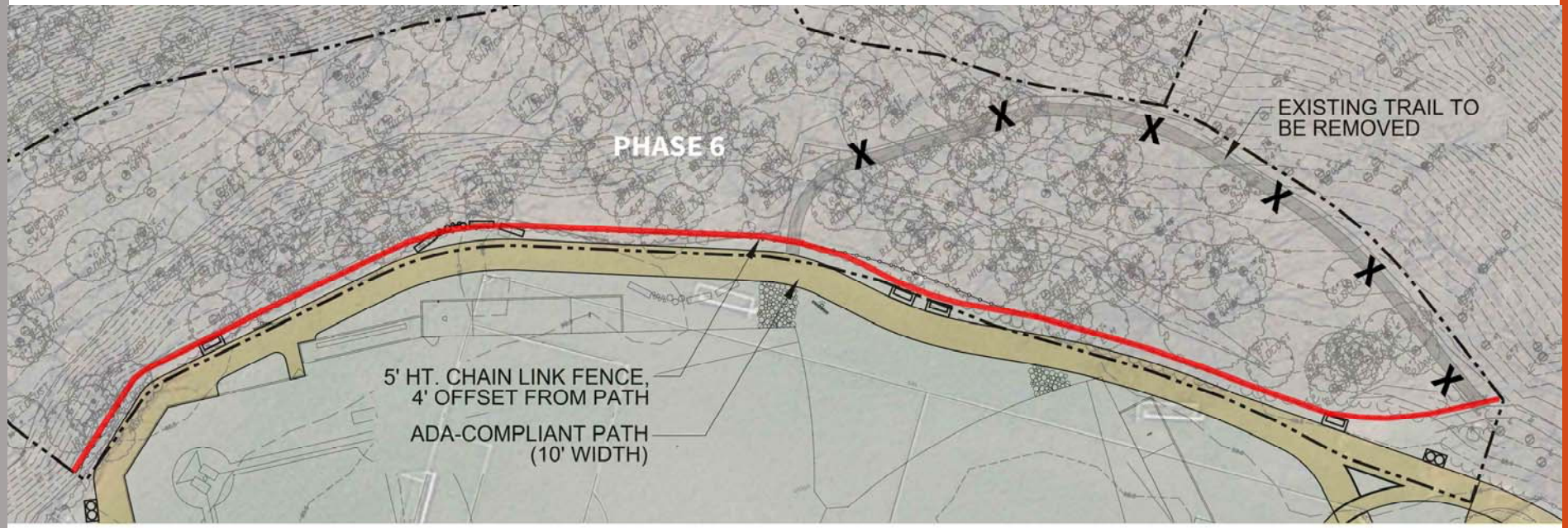
1. Ten foot (10') width
2. ADA-compliant
3. Porous bituminous concrete paving
4. Drains away from Fresh Pond



View Looking West

Proposed Path and Fence Alignments

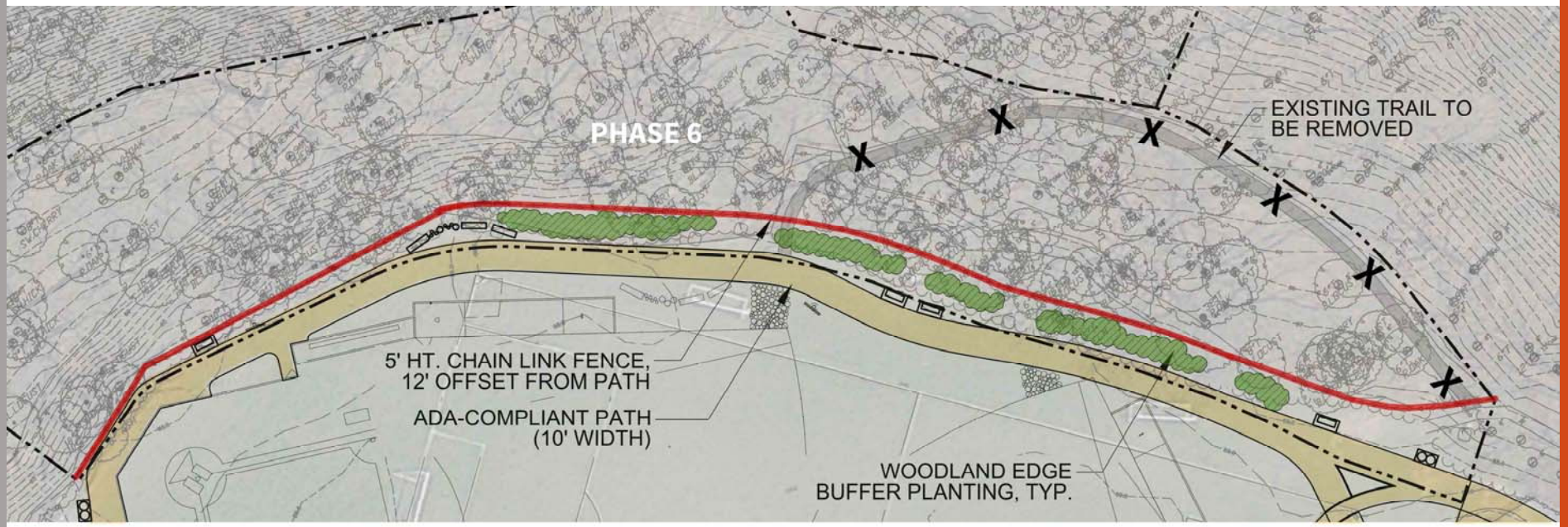
Woodland Trail Closure



Alternative 1

Proposed Path and Fence Alignments

Woodland Trail Closure



Alternative 2

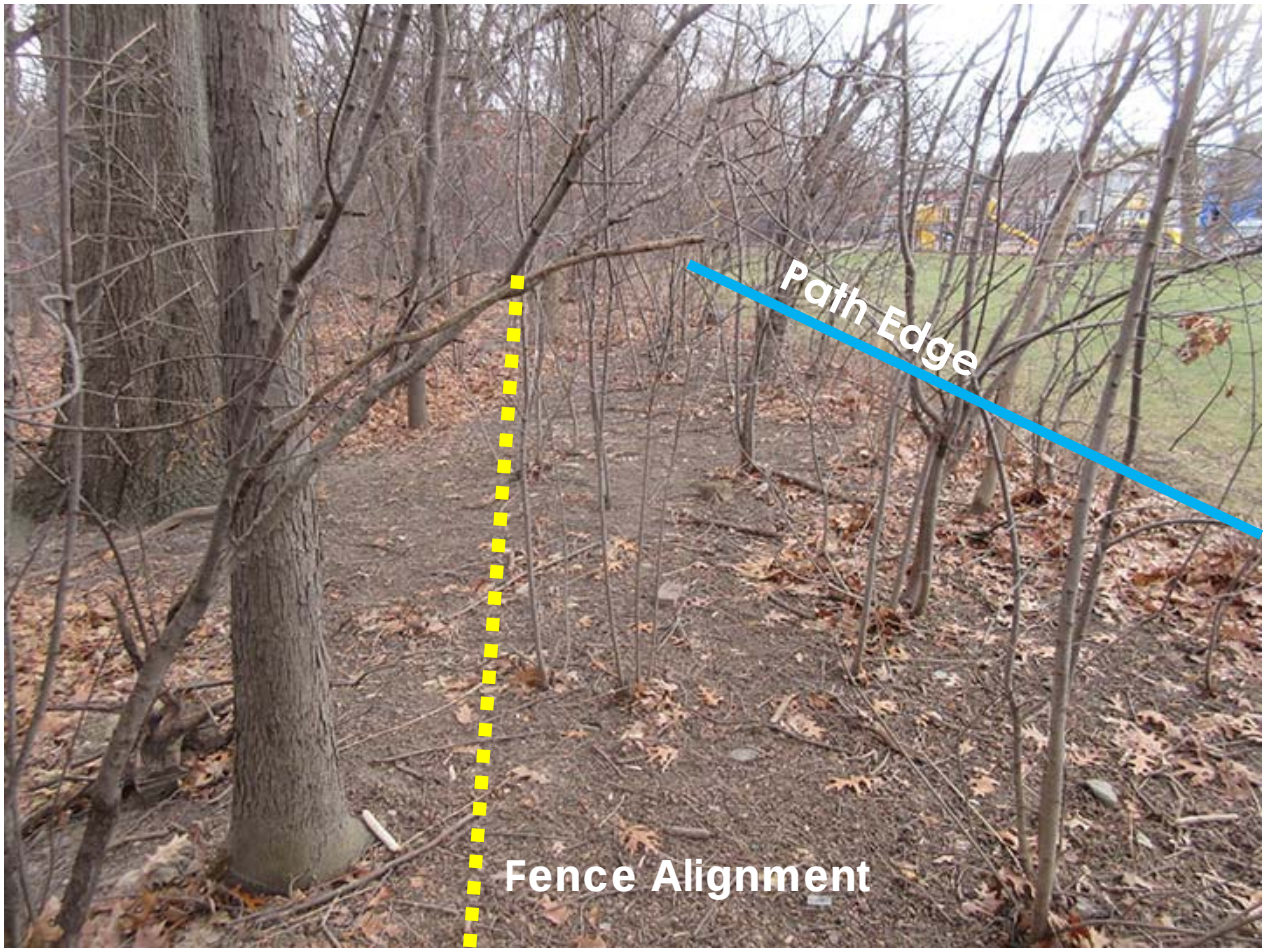
NORTH

0 20' 40' 60'

Fence Alignment – Woodland Edge

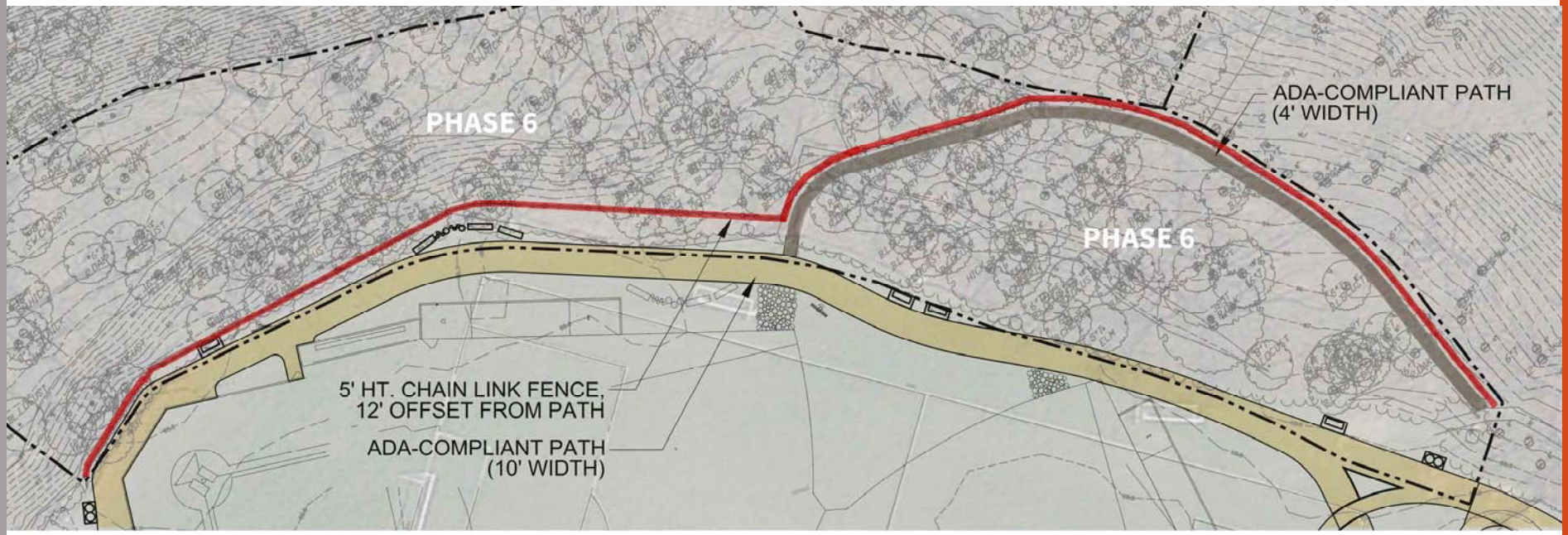
Advantages:

1. Twelve foot (12') setback from proposed loop path
2. Invasive removal and Woodland Edge buffer planting
3. Minimal impacts to existing tree roots



Proposed Path and Fence Alignments

Location of ADA-compliant Path and Fence



Alternative 3

Slope Restoration Timeline

- Feb 24 2020 – Informational meeting with Con Com
- Mar 9 2020 – RDA Hearing with Con Com
- Feb/Mar 2020 – Submit Bid Documents
- Mar 2020 – Black Locust Tree Removal
- May-Sept 2020 – Slope Restoration and Planting
- Sept 2020 – Punch List
- Sept 2021 – Plant Guarantee Site Visit