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Brook Tunnel Stream Mitigation Project

Somerset County Pennsylvania

Presenters:
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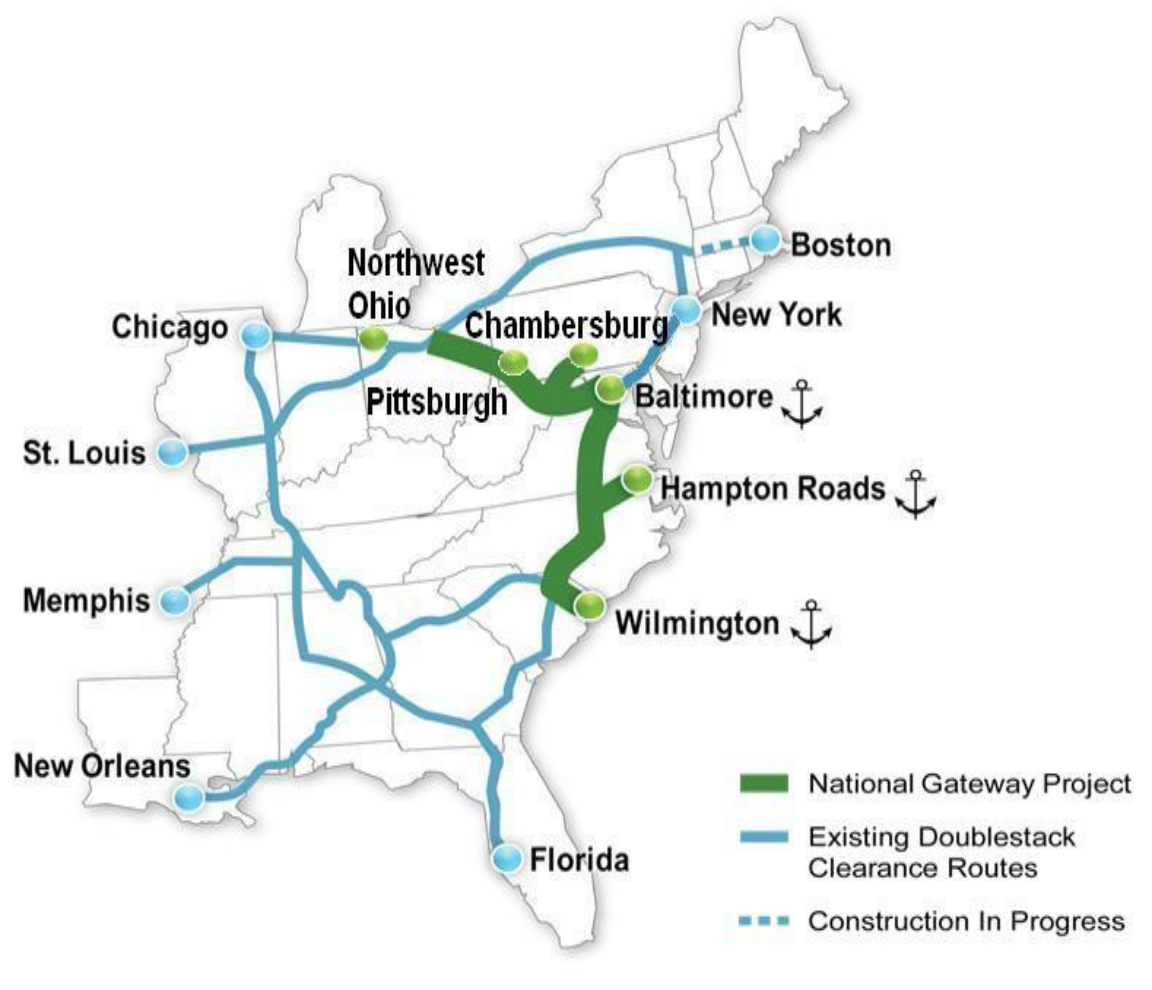
CSX National Gateway Program – CSX Brook Tunnel



Emergency Tunnel Repairs

- Perennial stream located directly above the tunnel severely eroding and infiltrating the tunnel celling
- Joint Permit review with Pennsylvania Department of the Environmental Protection Department and United States Army Crops of Engineers
  - The project qualified for a PADEP emergency permit as there was a clear risk to life, property and the environment, but required a retroactive Joint Permit Application filing

Emergency Tunnel Repairs

- The tunnel repair required the portal to be daylighted – substantial impacts to at grade resources
  - 1,500 Linear feet of perennial steam – Temporary
  - 630 linear feet of perennial stream – Permanent
  - Loss of benthic macroinvertebrate habitat, cold water fisheries/Trout habitat and riparian vegetation

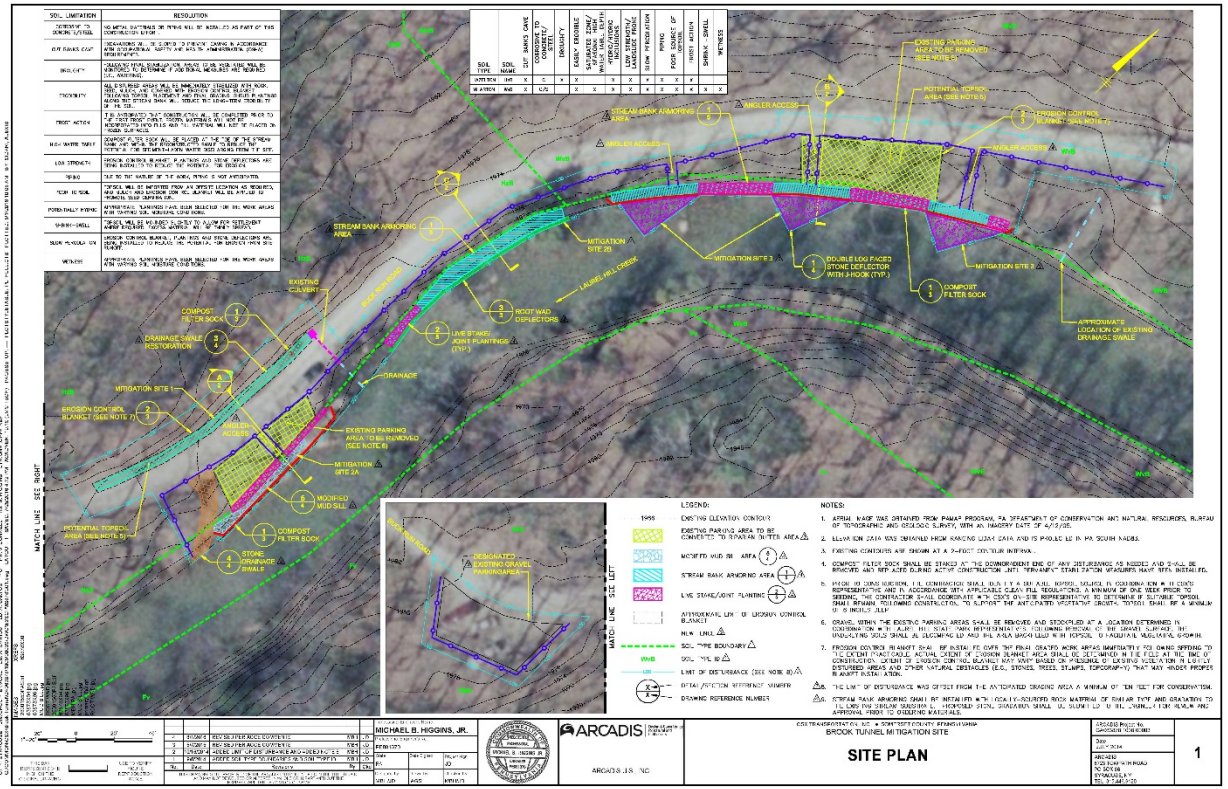
Stream Mitigation Site Selection

- **Site Selection Constrains**
  - Pennsylvania has no in-lieu-fee mitigation program
  - PADEP Requires in-kind mitigation
  - Onsite mitigation at Brook Tunnel not feasible
- **Mitigation Site Search**
  - Met with local and county governments; conservation organizations; watershed groups; and private citizens
  - Site search focused on advanced projects to minimize permitting delays
  - PADEP would not consider sites located outside the sub-watershed
- **Sites Considered**
  - Miller Farm – Privately own farm with degraded stream
  - Dunbar Creek – Existing Trout Unlimited assessment
  - Laurel Hill State Park – Gravel road improvement

Stream Mitigation Site Selection – Finally…

- **Laurel Hill Creek**
  - Initial search focused on reducing sediment from unpaved roads
  - Severe stream bank erosion/undercut banks and sedimentation observed
  - Degraded benthic macroinvertebrate and trout habitat
  - Road in danger of being washed out
  - Listed on the Clean Water Act 303.D List
  - Specimen tree protection (Hemlock)
- **Laurel Hill Creek Benefits**
  - Selected reach located within the Laurel Hill State Park Complex; therefore no conservation easement required
  - In addition to these two benefits, the following slides reflect the meaningful benefits the stream received

Laurel Hill Creek Site Mitigation Plan



- **Instream Habitat Improvements**
  - Double log faced stone deflectors w J-hooks
  - Rootwad deflectors
  - Modified mud sill cribbing
- **Stream Bank Improvements**
  - Riparian Vegetation Planting
  - Stone Armoring
  - Road guardrail and designated anger access/parking area

Instream Habitat Structures

Double Log Faced Stone Deflectors with J-Hooks

Benefits

- Provide streambank stability
- Deposit substrate along the bank
- Narrow the existing stream channel
  - Deeping effect
- Logs Provide instream habitat
- J-Hooks provide fish habitat
- Increase riffle/pool habitat
- Provide angler access

Instream Habitat Structures

Rootwad Deflectors

Benefits

- Provide excellent macro invertebrate and fish habitat
- Provide streambank stability
- Captures vegetative matter/detritus
- Provides macroinvertebrate habitat
- Increases food chain supply
- Provides excellent trout/fish forage habitat that is not easily duplicated
- Increases dissolved oxygen by aerating the water

Instream Habitat Structures

Modified Mud Sill Cribbing

Benefits

- Provides overhead cover for fish
- Provide excellent macro invertebrate habitat (rotting log face attracts them)
- Provides trout forage habitat
- Increases overall habitat space for trout (i.e., the distance of living space needed)
- A component of the streambank stabilization with the armor stone

Stream Bank Improvements

Riparian Vegetation Planting

Benefits

- Bank stabilization
- Stream shade habitat – reduce thermal stream degradation
- Reduce sediment/nutrients loading
- Wildlife habitat
- Increase biodiversity
- Future woody debris will enter stream habitat
    - Instream habitat

Native species

- Silky Dogwood, Silky Willow, Arrowwood, Black Chokeberry, Gray Dogwood
- Willow stake/joint plantings

Stream Bank Improvements

Stream Bank Armoring

Benefits

- Bank stabilization
- Prevent the lost of existing riparian habitat from undercut banks
- Prevent the lost of Buck Run Road
- Reduce sediment loading
- Reduce sediment/nutrients loading
- Creates fish habitat (space between rocks) for juvenile and adult species

Roadside Restrictions

Angler Impact Reduction / Education

Benefits

- Restrict impacts to the stream bank and riparian area
  - Remove unpaved angler parking
  - Provide limited angler access
- Provide designated parking on a gravel parking lot with educational signs
- Reduce soil compaction in the riparian root zone
- Reduce pedestrian impact to the riparian zone

Additional Benefits

Pennsylvania Fish and Boat Commission

Jimtown Road Stream Restoration Project

- The mitigation site is located downstream from an recently completed stream restoration project. The proximity of the two stream restoration sites creates a unique opportunity to multiply the ecological benefits of both sites.

Keystone Select Stocked Trout Waters

- The PAFBC selected this reach of Laurel Hill Creek as one of eight streams within the state to be included in the Keystone Select Stocked Trout Waters program (KSSTW).

Pennsylvania Department of Conservation and Natural Resources

- The project gained direct support from Secretary Cindy Dunn
- Project team meet Secretary Dunn onsite to walk the project
- Secretary Dunn expressed her graduate on behalf of the department for the investment CSX provided.
- Secretary Dunn offered to continue the CSX PADCNR partnership and would facilitate projects within the park system.

Early Sign of Success : Post 1-Year

Multiple events with high rainfall

- No observed stream bank erosion

In-stream habitat improvements structurally sound

- All structures are in place and functioning after almost 1 year

Benthic macroinvertebrate community returning

- Park manager and anglers report increased benthic macroinvertebrate activity.

Angler Survey

- The park reports positive feedback from anglers

Installed vegetation is established and propagating

Questions and Additional Information

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