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REBUILD ILLINOIS

Illinois Capital Development Board

The Team for Illinois Beach State Park Shoreline Stabilization Community Outreach

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Illinois Department of Natural Resources

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Agenda

- Welcome and Introductions
- History & Engineering Background
- Protection of Habitat and Current Infrastructure with Habitat Creation
- Overview of Current Design Construction Schedule
- Q&A

State of Illinois Capital Development Board (CDB)

- CDB is funding and managing the Illinois Beach State Park Shoreline Stabilization Project

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Agency Information

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50 YEARS

- CDB has supported the State of Illinois since 1972
- Oversees construction for:
  - Correctional centers
  - College and university buildings
  - Mental health hospitals
  - State parks
- Responsible for over 8,770 state-owned buildings.
- 140 Full-time employees

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Agency Mission

- Efficiently manage the vertical construction projects and capital planning in Illinois for State Agencies and Higher Education Institutions
- Ensure that quality capital projects are delivered on schedule and on budget
- Provide a fair and inclusive environment to support diversity efforts in the design and construction industries

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Strategic Goals

- Continuous improvement on project delivery methods.
- Implement new technologies to assist in capital project management.
- Hire and retain qualified staff.
- Promote an organizational culture emphasizing diversity, equity, inclusion and accessibility

Value of Existing Habitat Structure and Park

Illinois Department of **Natural Resources**

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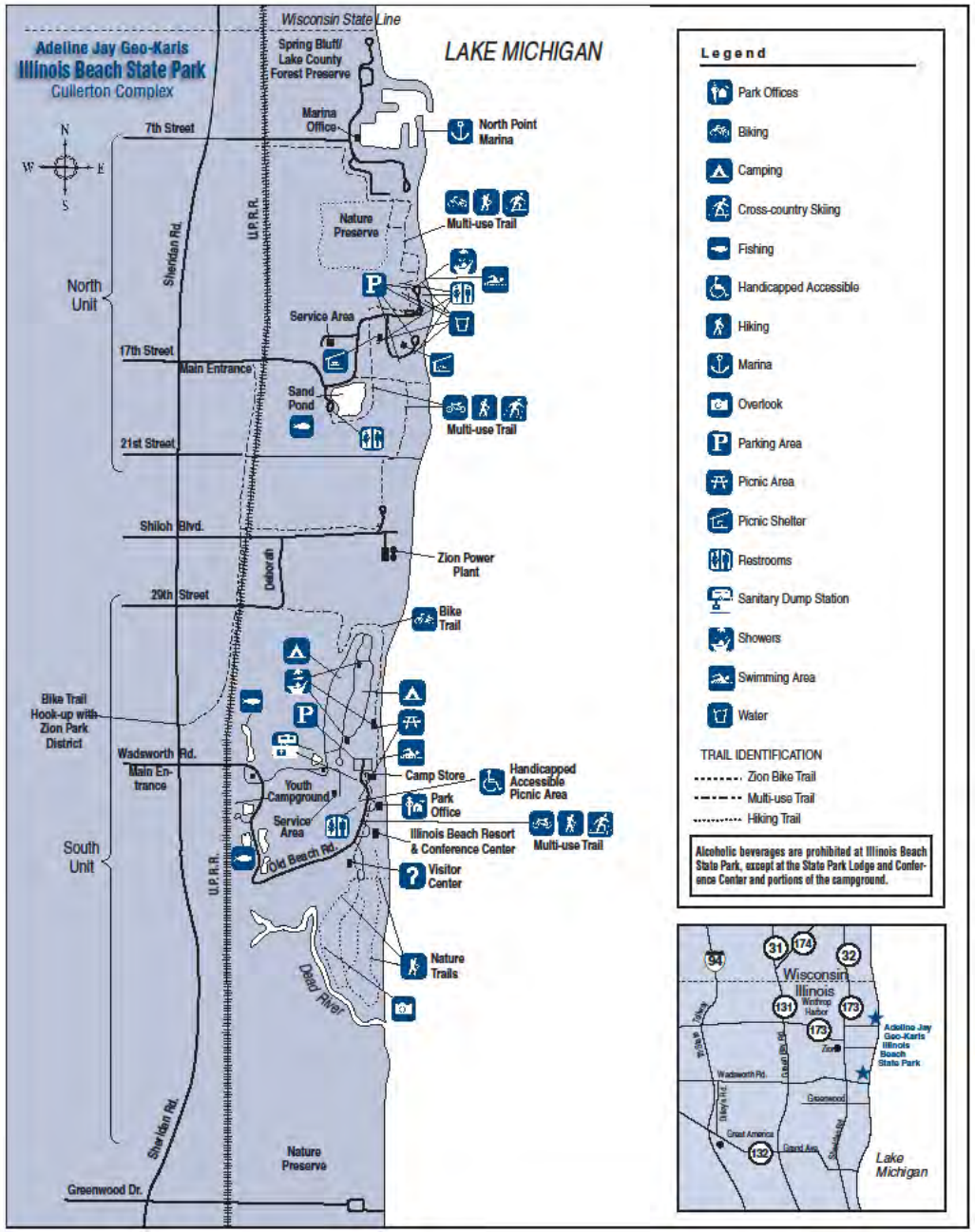
Project Goal:

Minimize the wave energy along the shoreline and reduce the littoral transport of sand.

Project Objectives:

1. Protect, preserve & enhance habitat,
2. Protect existing infrastructure, and
3. Preserve the natural beauty of the site and make it aesthetically pleasing.

- 6th Largest Lake in the World
- 307 miles North to South
- 118 miles East to West
- 22,300 square miles in area
- Most of the lake is < 300 ft deep
- Maximum depth is 925 feet
- Minor lunar tidal effect
- Over 1,500 registered shipwrecks



Illinois Beach State Park

- Established as a State Park in 1948
- Last major acquisition in 1982
- North Unit & South Unit are separated by closed Nuclear Power Plant
- Recreational opportunities include hiking, swimming, camping, fishing, boating, or just relaxing on the beach.
- Officially renamed in 2010 to honor former State Senator Adeline Jay Geo-Karis Illinois Beach State Park

Illinois Beach State Park & North Point Marina

- 6.5 miles of shoreline along Lake Michigan
- 4,163 acres of Zion Beach Ridge Plain to manage
- 2.8 million visitors annually
- 2 large nature preserves within the park, over 650 plant species
- Campground with 230 Class A camp sites
- Illinois Beach Resort & Conference Center, 92 guest rooms
- Over 5 miles of multi-use trails
- NPM - 1,500 boat slips (45 ft, 60 ft, and 90 ft)
- NPM - Full-service marina including concessions and boat repair

History & Engineering

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Damage and Erosion - Loss of Beach

Shoreline North of Park Office (2010)

Shoreline North of Park Office (2018)

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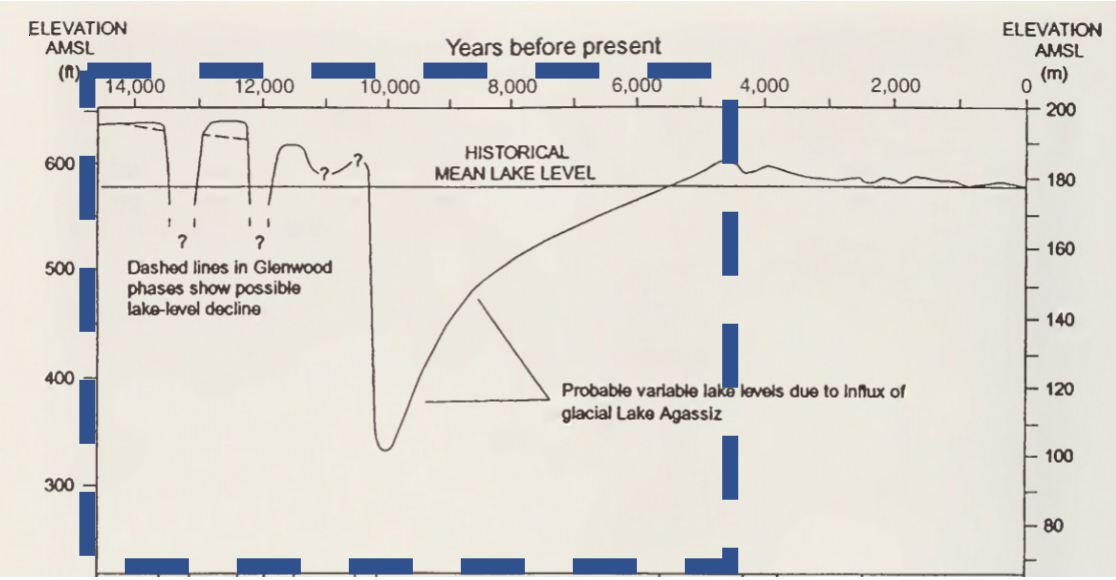
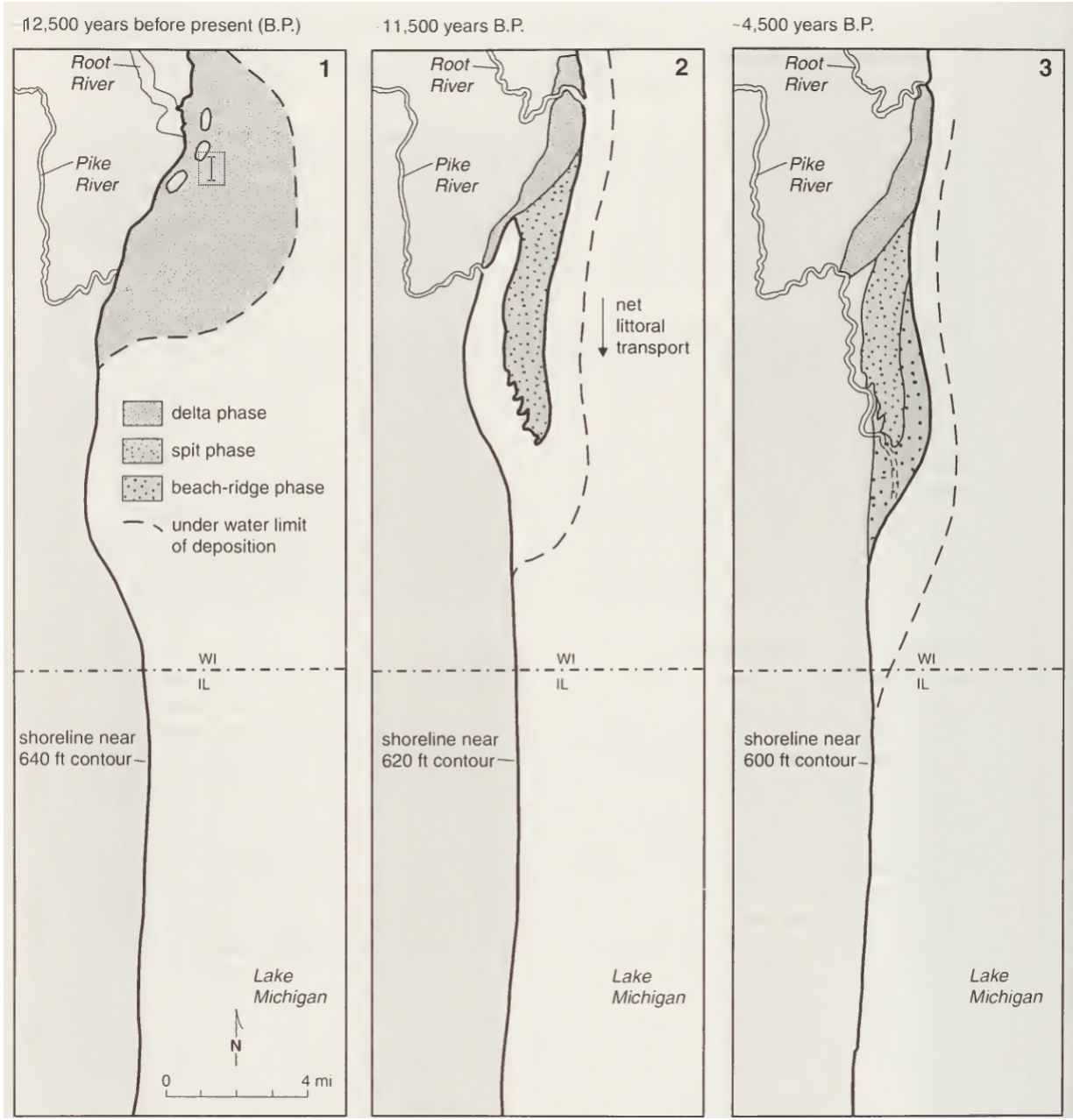
Damage and Erosion – Loss of Upland Habitat

North Beach Shoreline (2010)

Upland habitat loss North Beach (2021)

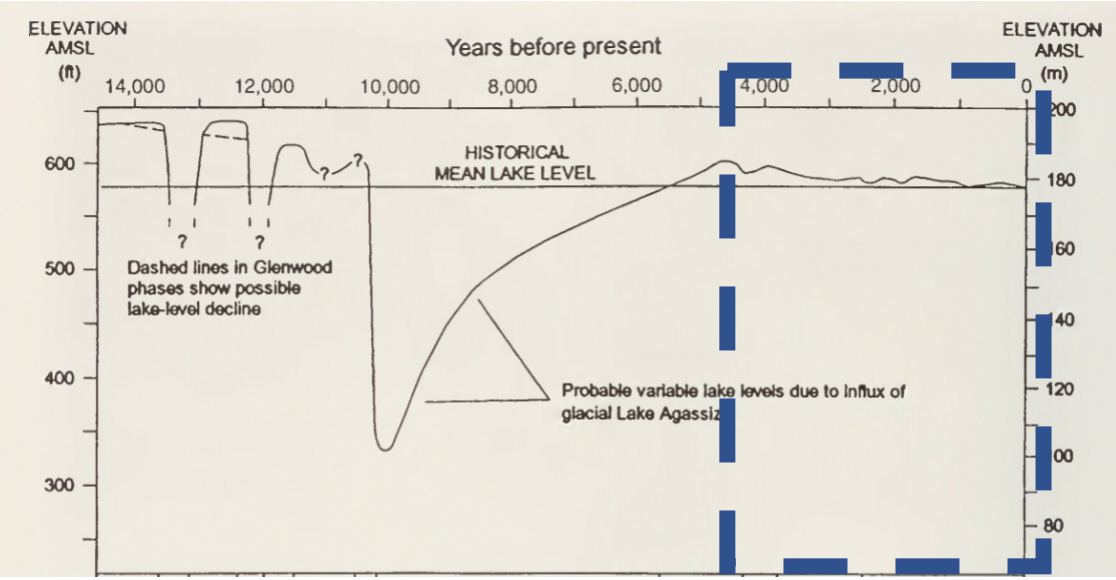
Shoreline Evolution

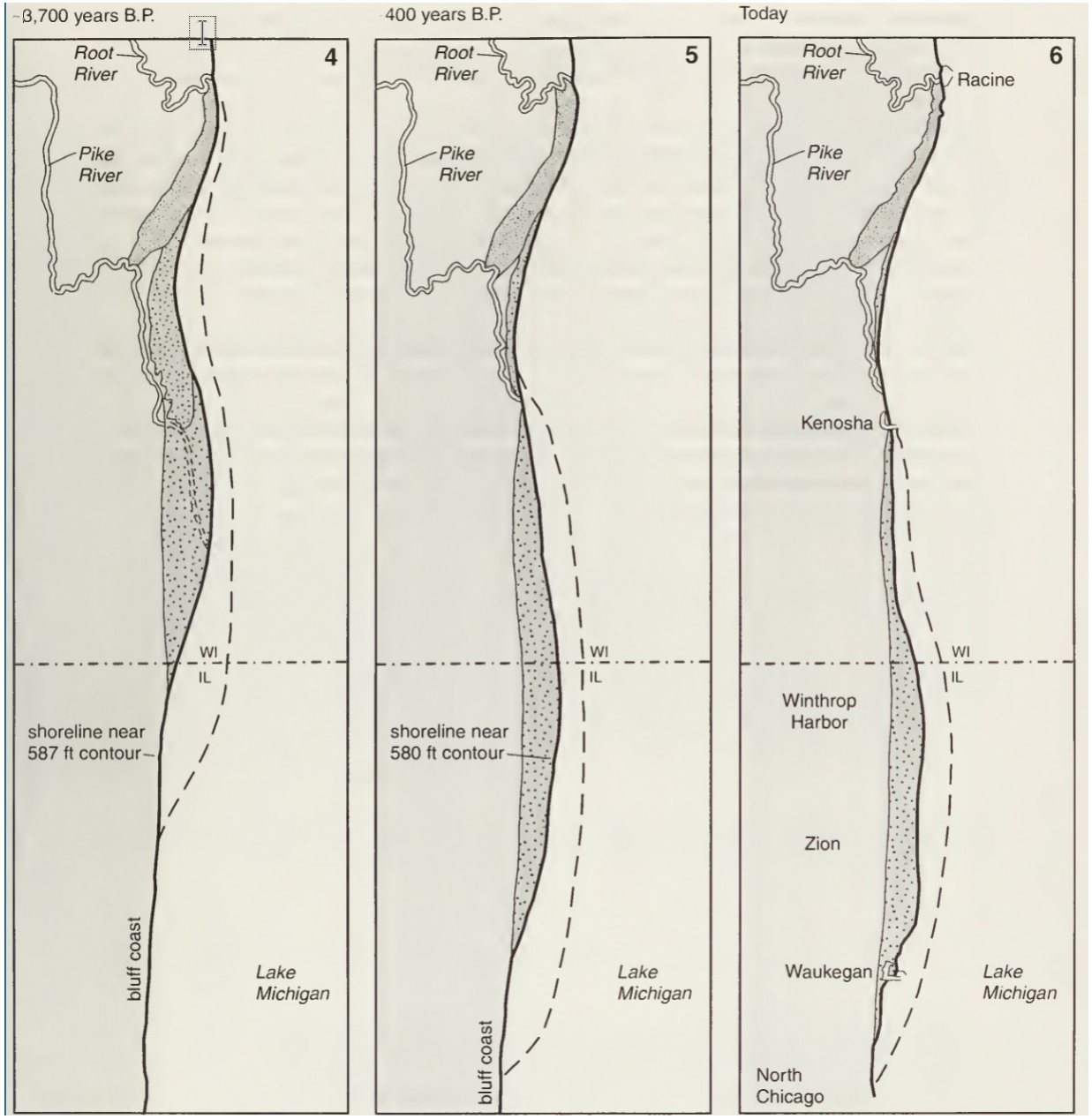




The Beach-Ridge plain is a Transient feature, that would continue to migrate and erode

Shoreline Evolution





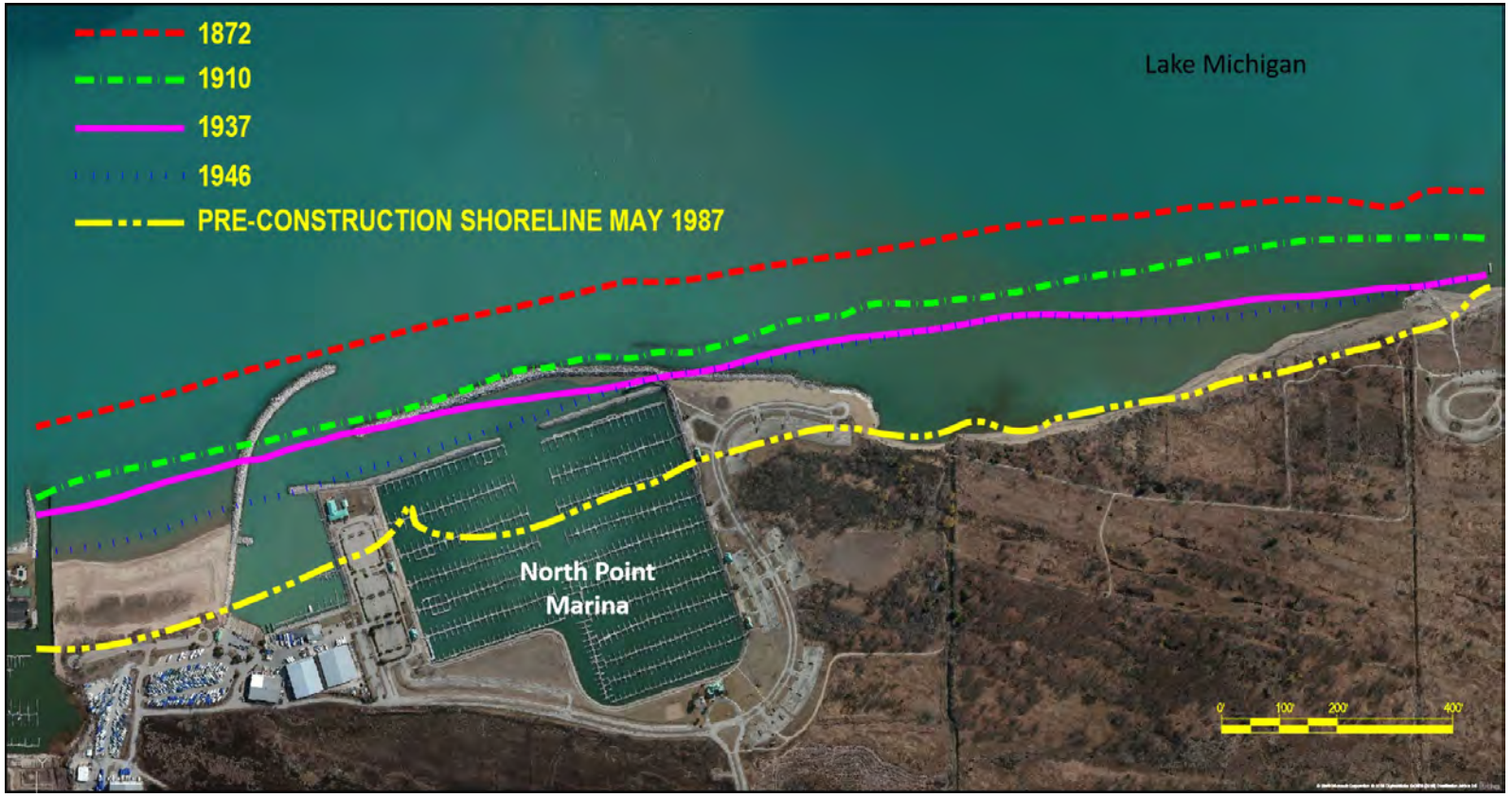
The Beach-Ridge plain is a Transient feature, that would continue to migrate and erode

Shoreline Evolution

The Illinois State Geologic Survey notes the shoreline to historically be erosive. Particularly, at the northern end.

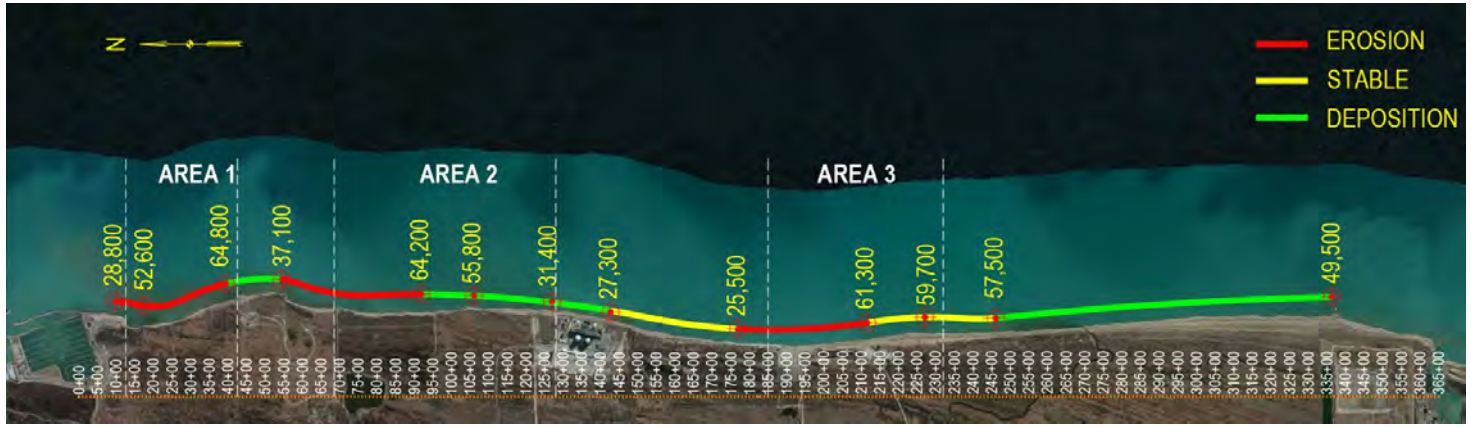
Shoreline erosion continues to be a response to natural factors rather than a result of human influences.

1987 was a period of High Lake levels comparable to recent High Lake levels.



What's At Risk?

Erosion threatens critical habitats and park infrastructure. If stabilization measures are not implemented loss of habitat and damage to park infrastructure will worsen.



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Project Goals and Objectives

- **Primary Goal: To develop shoreline erosion solutions that stabilize the shoreline, protect critical infrastructure, and reduce the natural transitory process.**

- Secondary Goal: Shoreline protection works should fit the character and mission of the park, considering aesthetics of the natural shoreline and user experience.

- Tertiary Goal: To the maximum extent possible design should embody intrinsic characteristics that are habitat enhancing or advancing.

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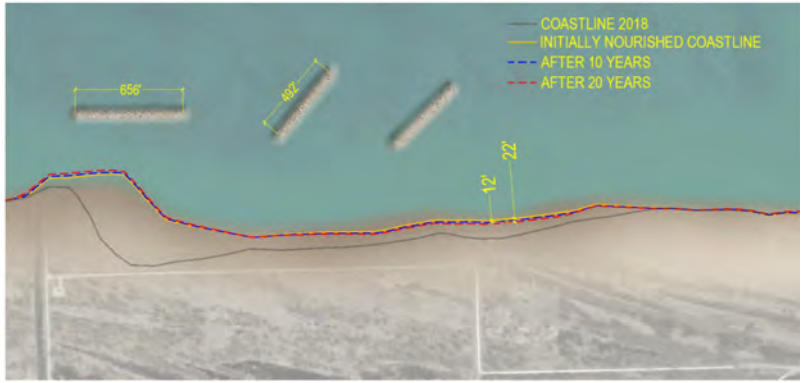
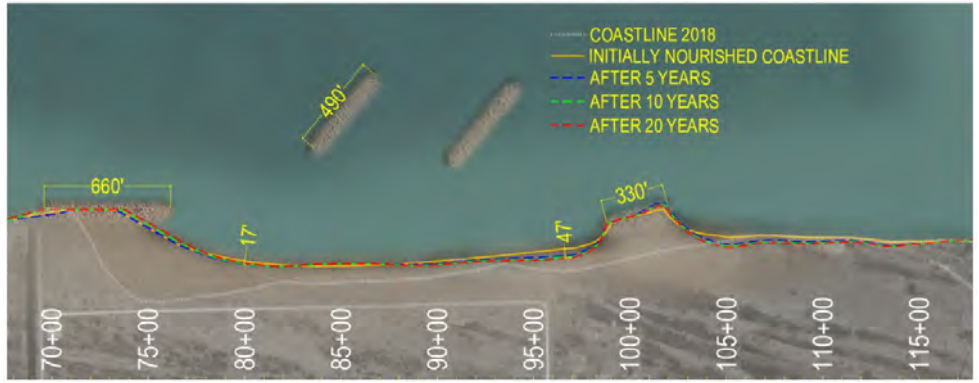
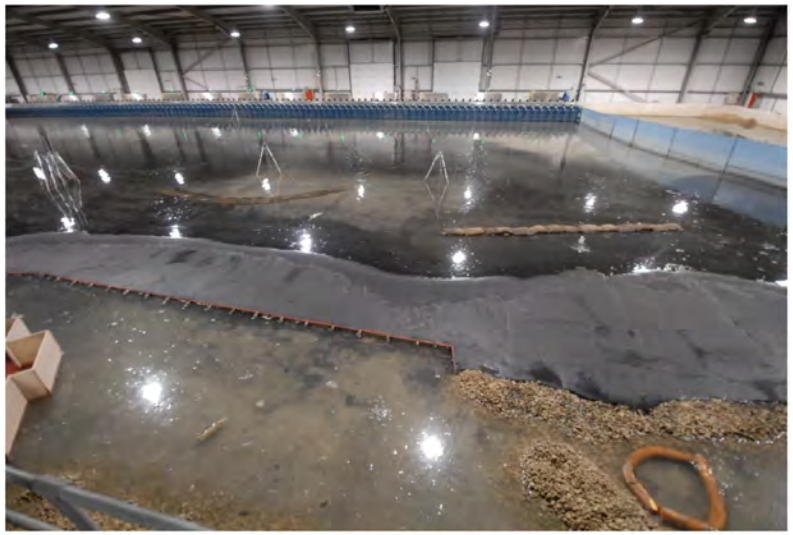
Project Approach – informed design





I**terative design** and analysis process was used to optimize performance along with **numerical and physical modeling** to test and further refine the structure layout and understand shoreline response.



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Understanding the Visual Aesthetic

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Understanding the Visual Aesthetic

LOW WATER VIEW

HIGH WATER VIEW

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Final Shoreline Stabilization Strategy

Final shoreline stabilization strategy in each area

- conform with natural processes and fit the character and mission of the park,
- reduce along shore transport of sand to stabilize eroding shorelines
- remain resilient and functional for anticipated water level variation.

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Final Shoreline Stabilization Strategy

Final shoreline stabilization strategy

- Consultation with Illinois EPA, US Fish and Wildlife Service, US Army Corps of Engineers, Illinois Department of Natural Resources – Office of Water Resources
- Public Notice Period: August 12-September 11, 2021
- Permits Issued: April 29, 2022

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Final Design

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LIVING HABITATS

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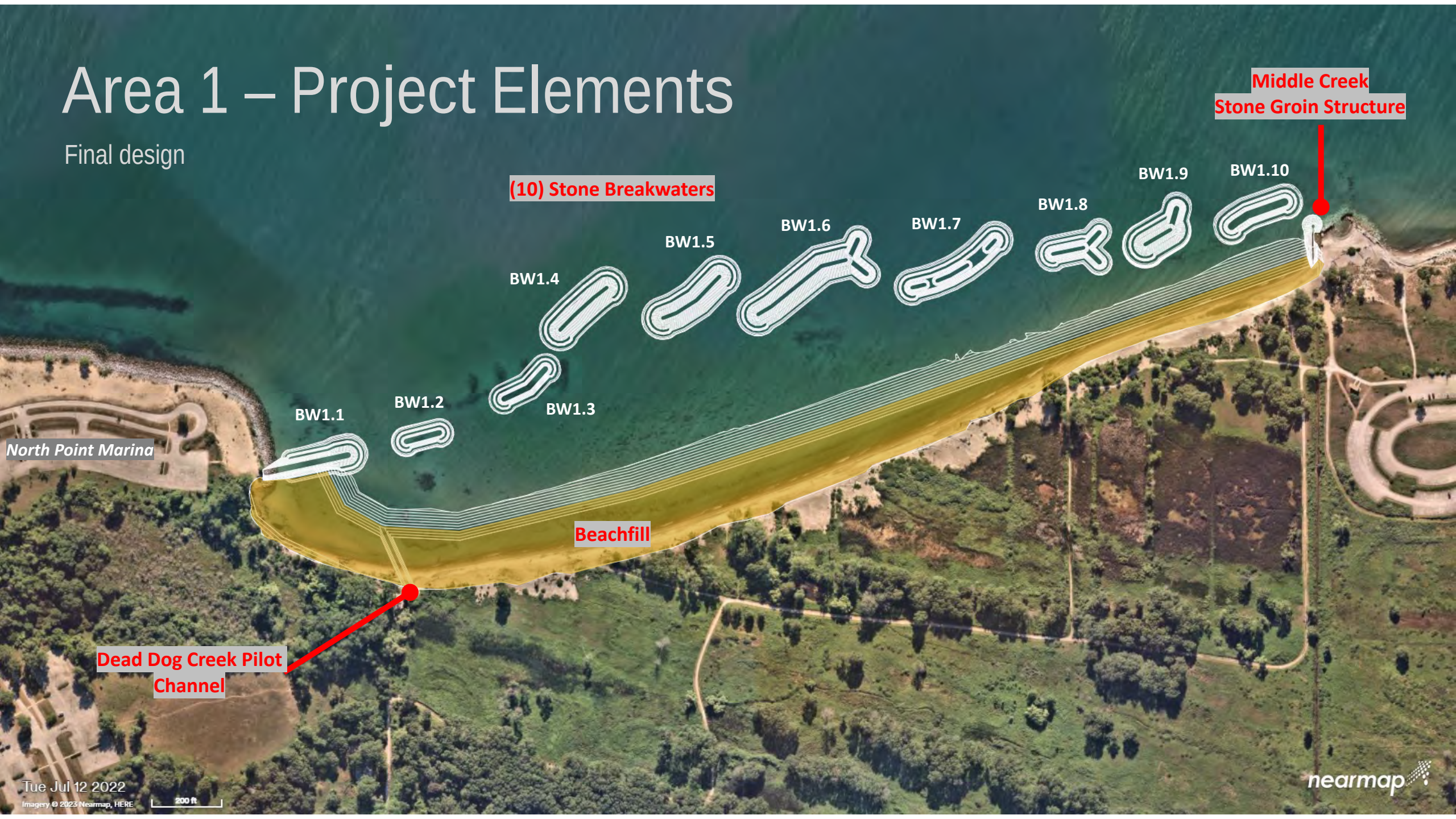
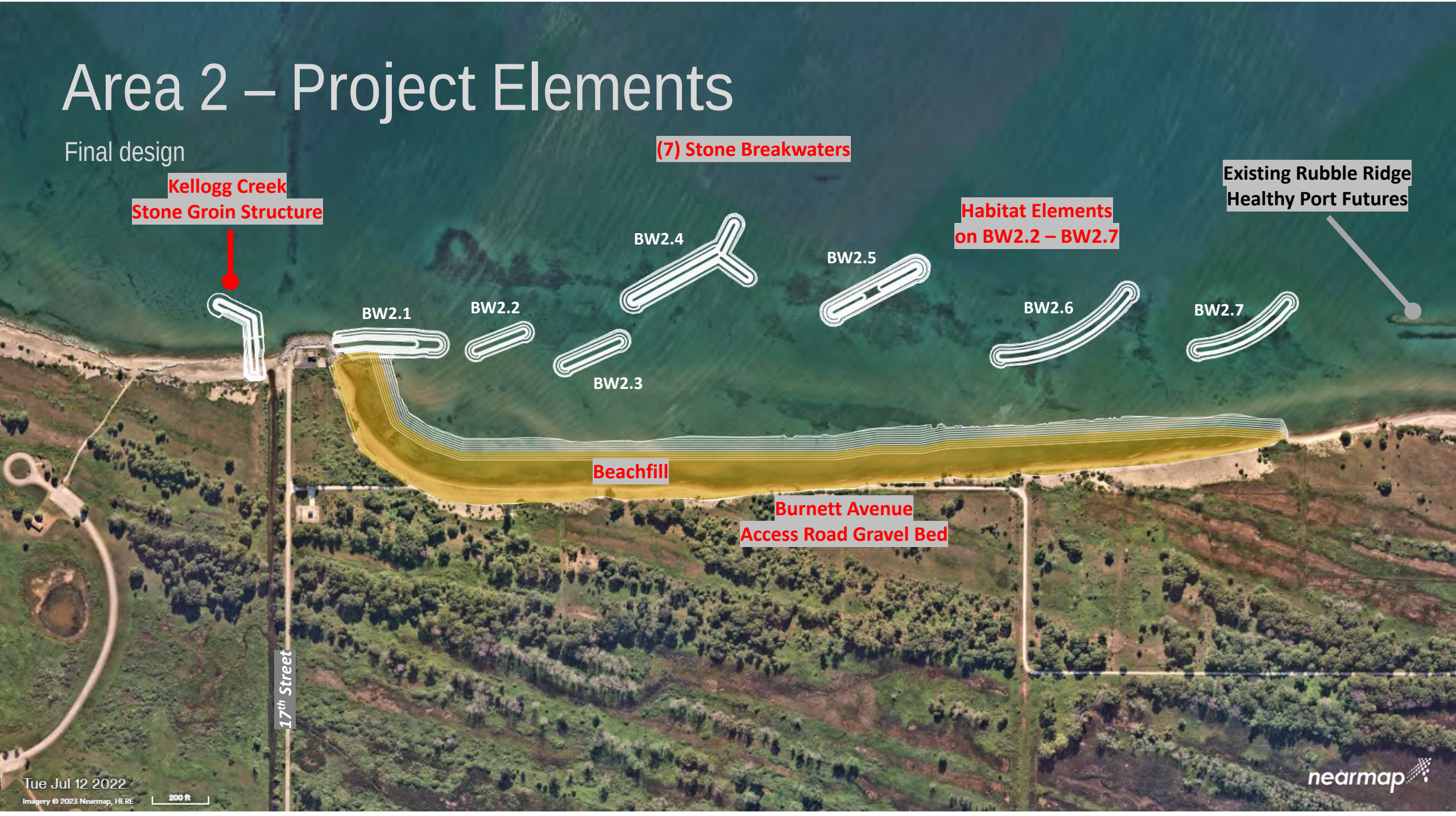
Area 1 – Project Elements

Final design



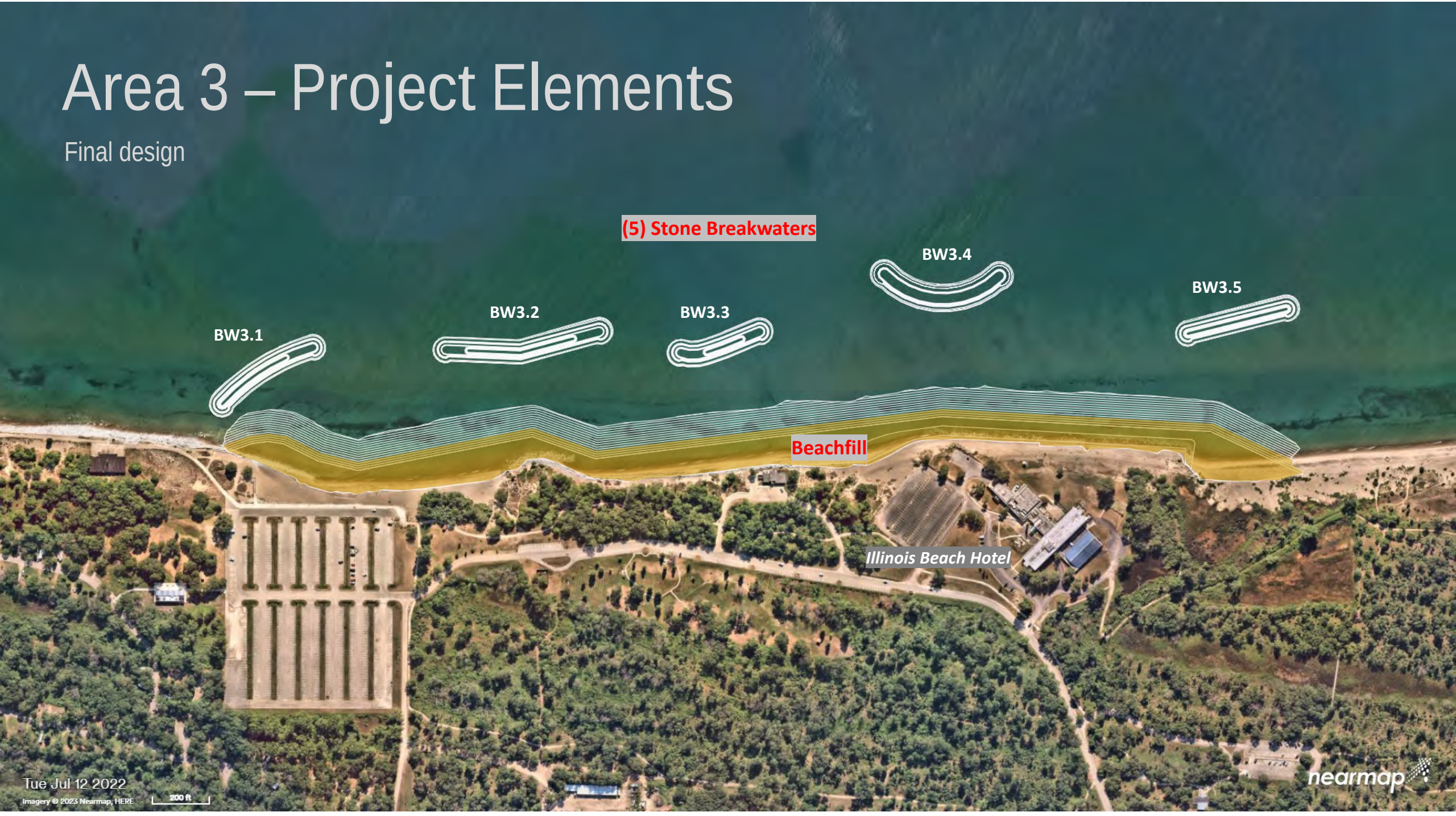
Area 2 – Project Elements

Final design

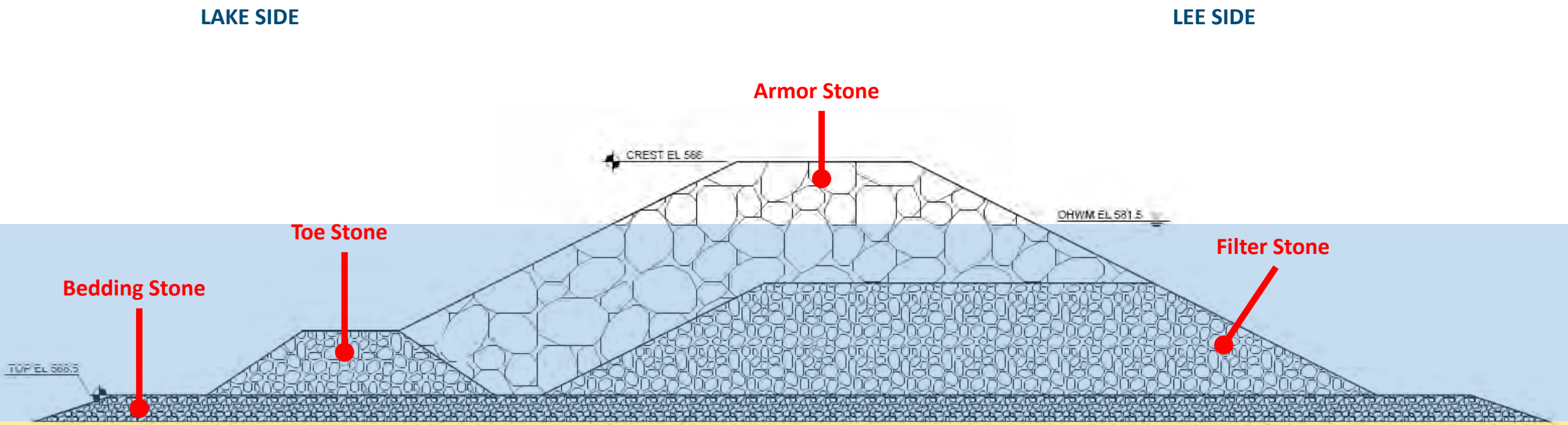


Area 3 – Project Elements

Final design



Typical Breakwater Section



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PRIMARY HABITAT PROJECT GOAL

Construct offshore shoreline stabilization structures in three locations along Illinois Beach State Park Lake Michigan frontage to mitigate erosion of high-quality terrestrial habitats and slow the transitory nature of the shoreline.

SECONDARY HABITAT PROJECT GOAL

Address specific avian and aquatic habitat creation and enhancement through targeted amendments.

LIVING HABITATS

AVIAN

The Park attracts three coastal bird species of special importance to the IDNR that have potential to be supported as part of this project; the Piping Plover, the Common Tern and the Caspian Tern.

The beach nourishment activities will restore valuable habitat for the Piping Plover. The existing beach ridge will be fronted with broad beach areas that will offer great new nesting habitat for this bird.

The breakwater structures hold the right lake position for Tern habitat and if amended with nest structures, the breakwaters have the potential to provide important new breeding locations for the Terns.

LIVING HABITATS

AQUATIC

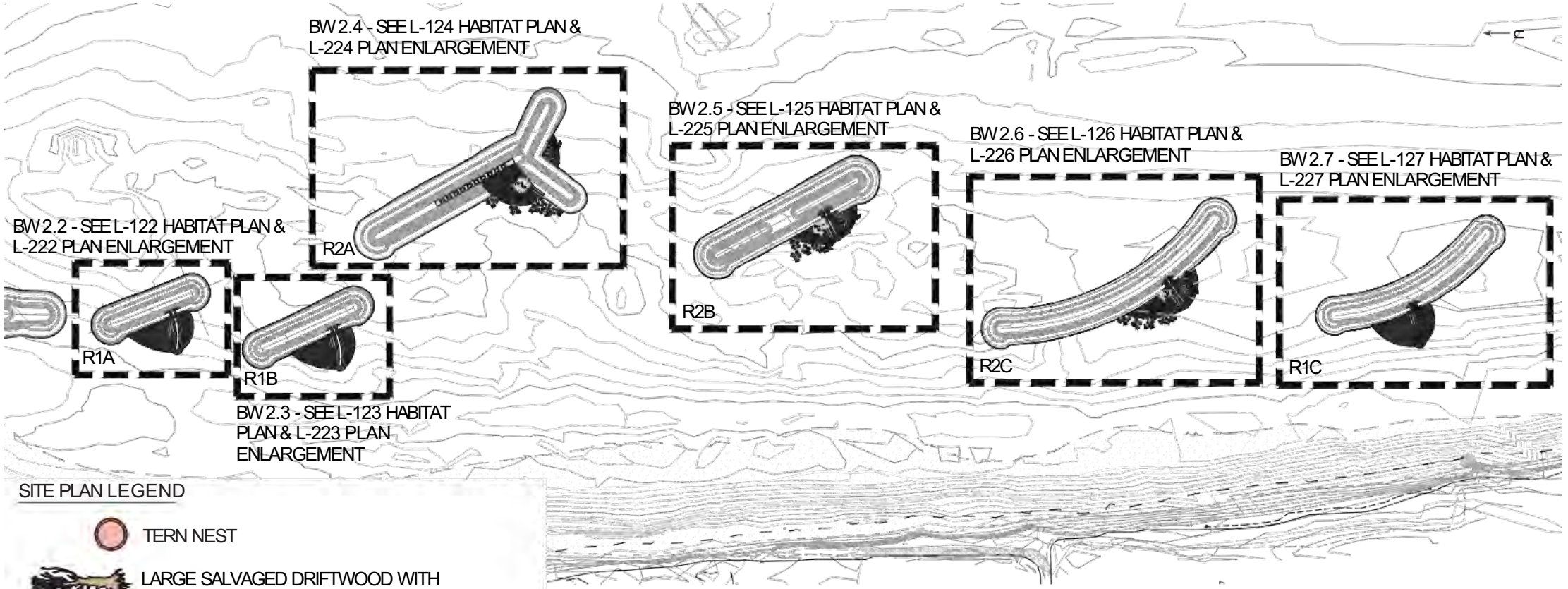
Most of the Great Lakes system suffers due to human impacts and invasive species. Despite this reality, Mudpuppies and Yellow Perch have been identified by the IDNR as species that have the potential to be offered additional habitat support as part of the project. Additionally, the project offers the opportunity to trial a variety of aquatic habitat amendments that could support a range of desirable aquatic species, with planned monitoring aimed at recording outcomes that can inform future Great Lakes projects.

A range of new habitat structures are proposed to be distributed on and around the breakwaters. These new habitat amendments have been limited to being positioned below the lake's historic low elevation so that they remain below the lake's surface.

LIVING HABITATS

HABITAT OPPORTUNITIES

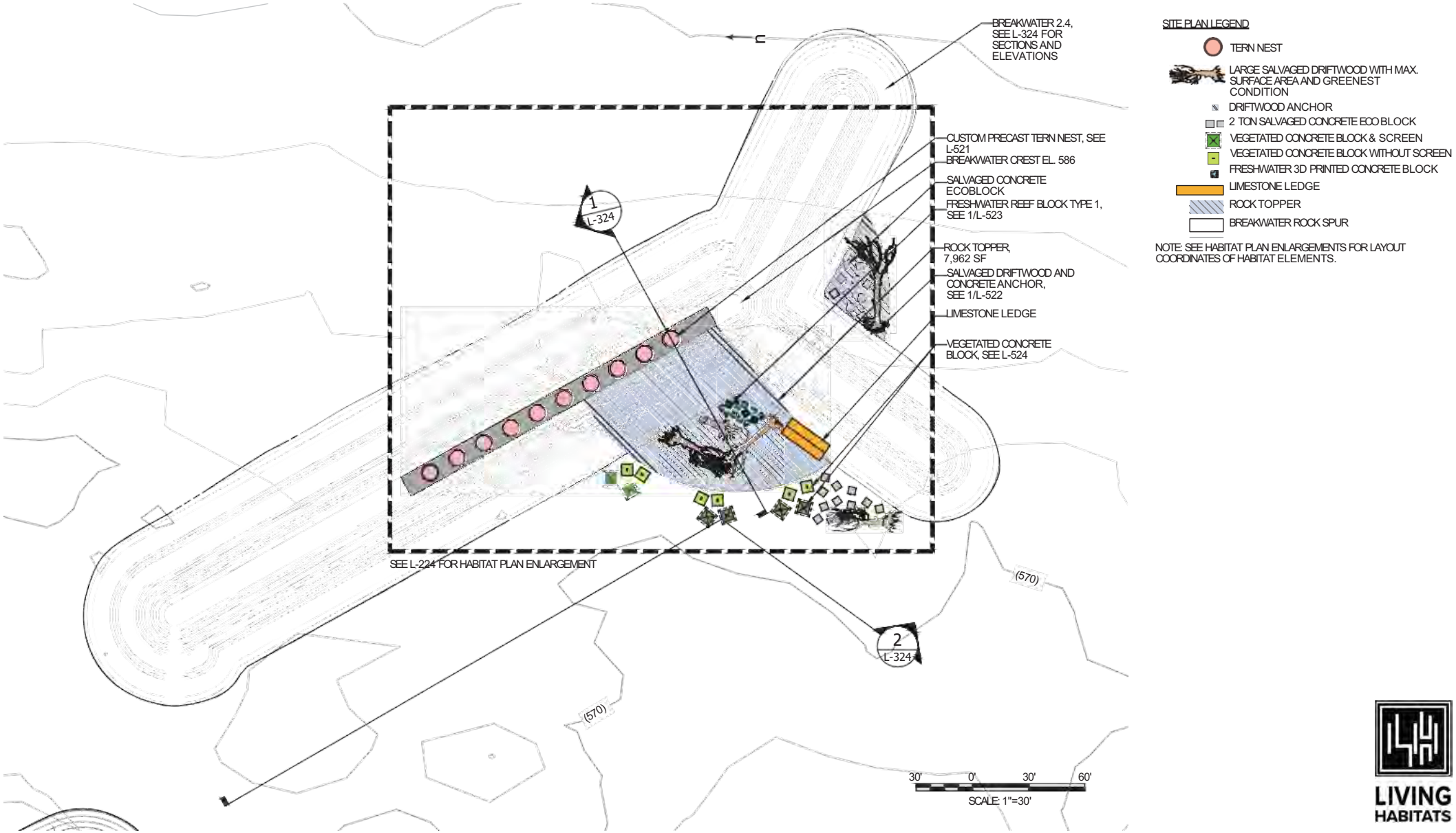
OVERALL HABITAT PLAN - AREA 2



LIVING HABITATS

HABITAT OPPORTUNITIES

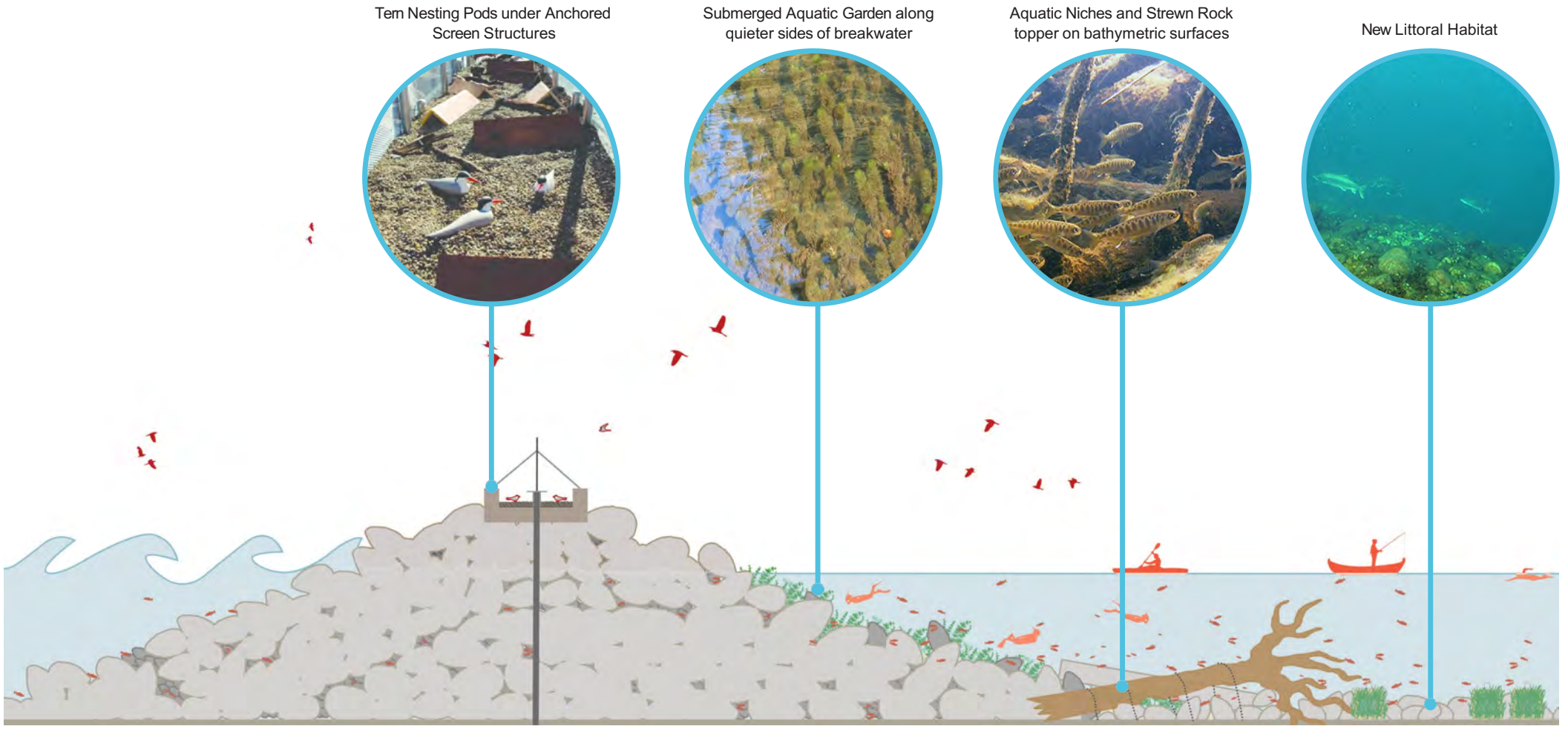
HABITAT PLAN - BREAKWATER 2.4



LIVING HABITATS

HABITAT OPPORTUNITIES

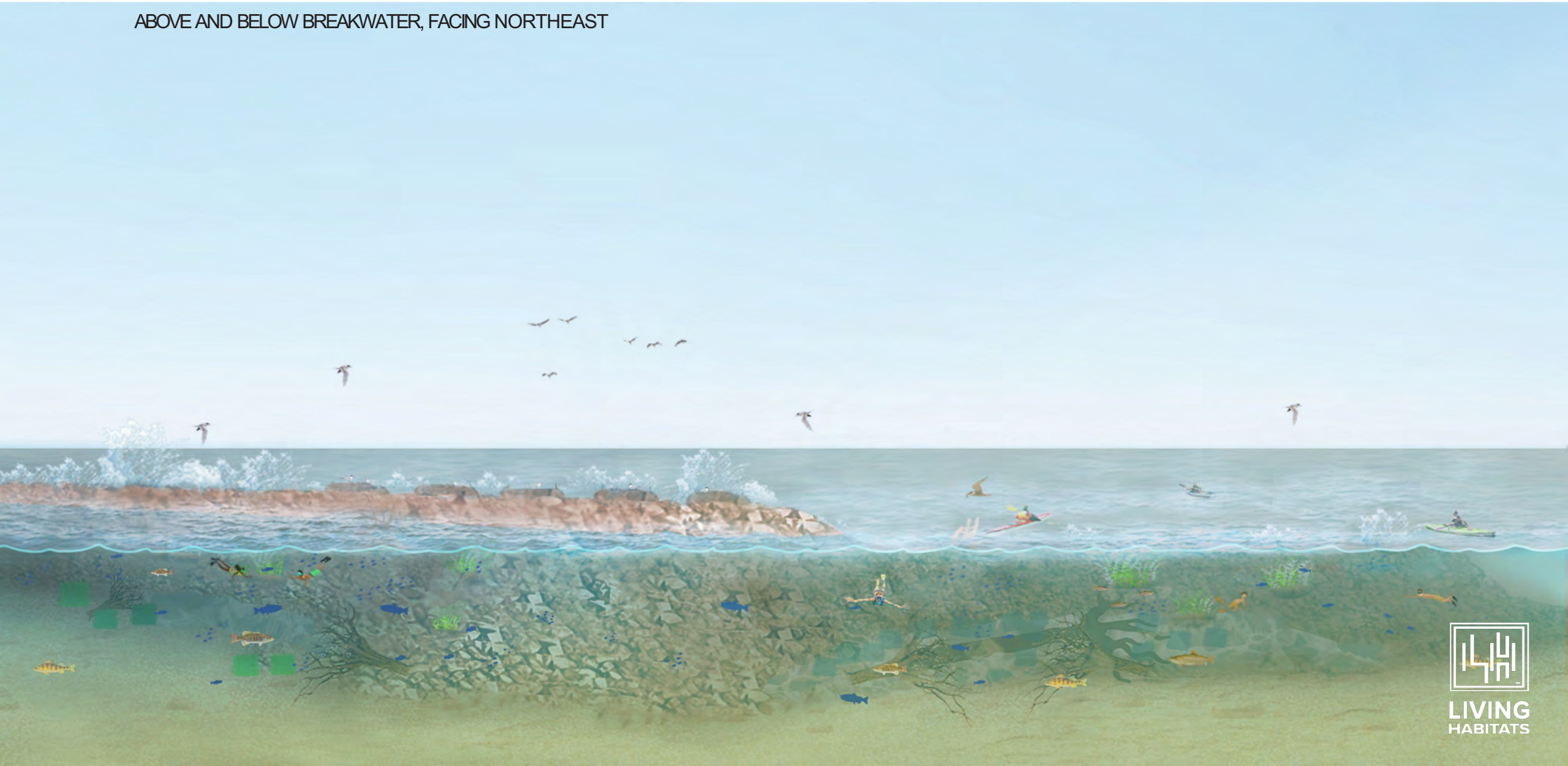
TYPICAL BREAKWATER SECTION



LIVING HABITATS

BREAKWATER 2.4
PERSPECTIVE RENDERING

ABOVE AND BELOW BREAKWATER, FACING NORTHEAST



LIVING HABITATS

DESIRED HABITAT ELEMENTS

GRAVEL AND STICK
TERN NEST

ROCK TOPPER: IRREGULAR STONE
PLACED ON LAKEBED

DRIFTWOOD
HABITAT

COMMON TERN NEST
AND EGGS

SUBMERGED
VEGETATION

CONCRETE
BLOCK

LIVING
HABITATS

PLANNED HABITAT ELEMENTS

SALVAGED CONCRETE ECO BLOCKS

SALVAGED DRIFTWOOD FOR HABITAT

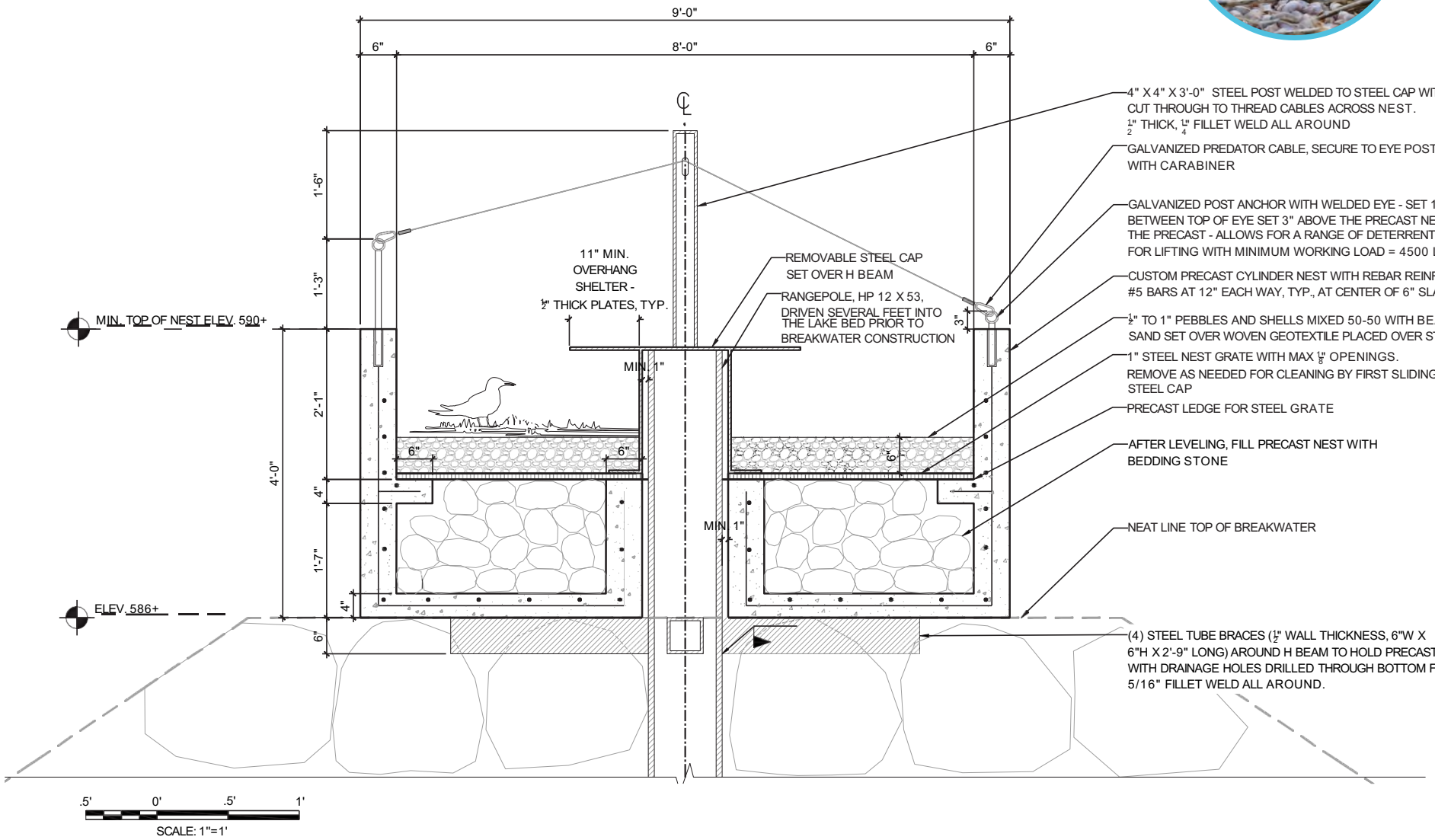
CONCRETE HABITAT BLOCK

SALVAGED DRIFTWOOD FOR HABITAT

LIVING HABITATS

PLANNED HABITAT ELEMENTS

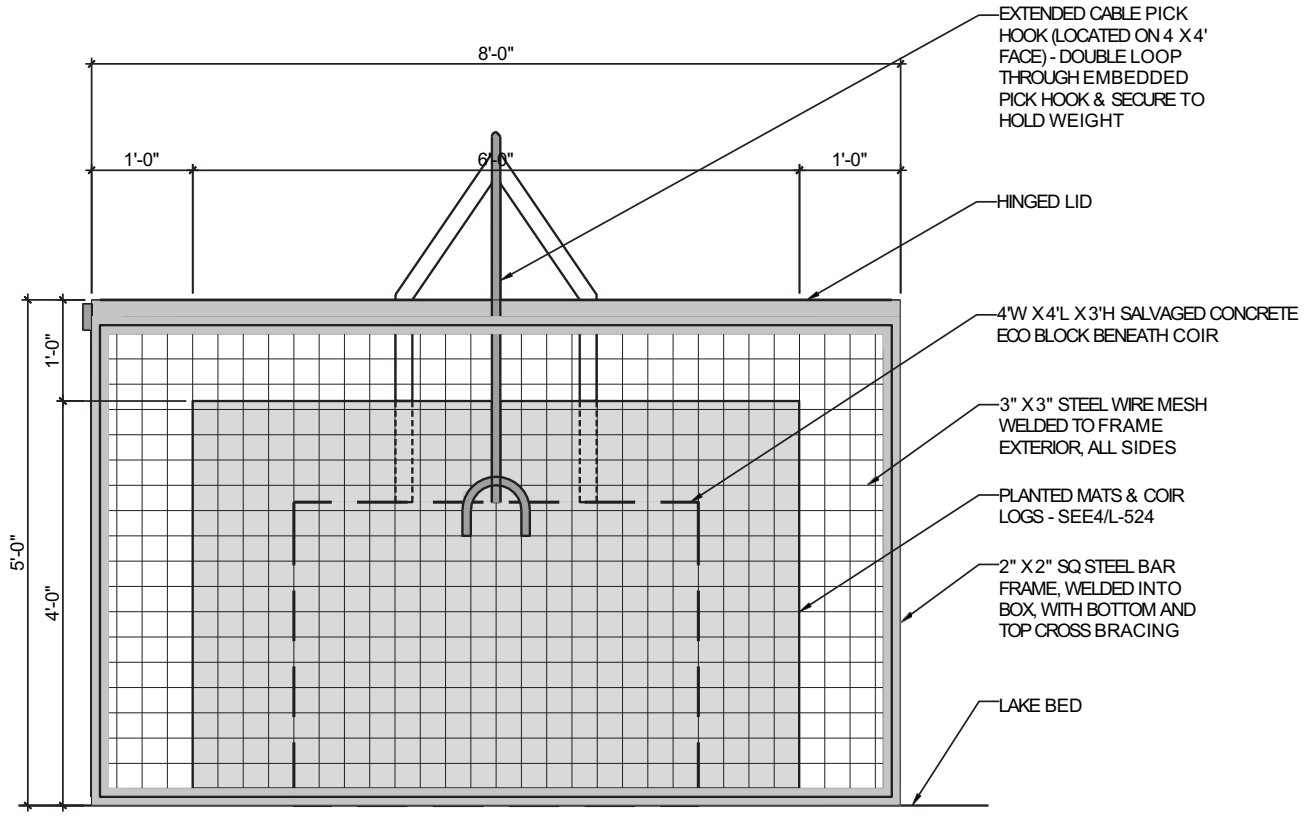
TERN NEST CONSTRUCTION DETAIL



LIVING HABITATS

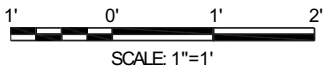
PLANNED HABITAT ELEMENTS

VEGETATED CONCRETE BLOCK



VEGETATED CONCRETE BLOCK - ELEVATION

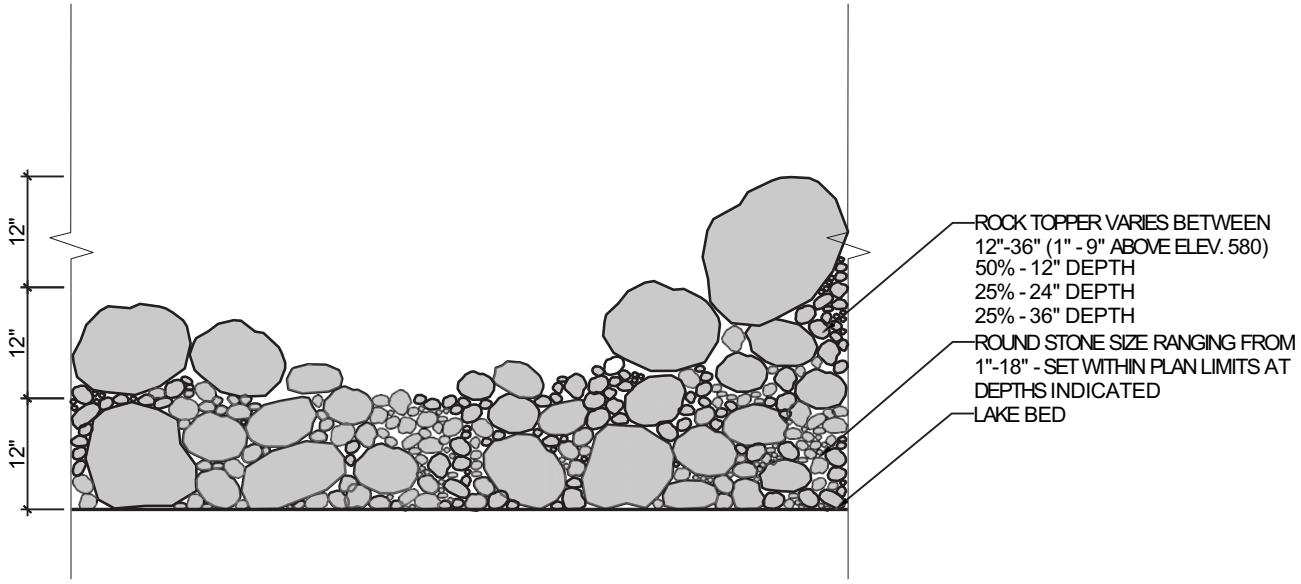
VEGETATED CONCRETE BLOCK - AXONOMETRIC



LIVING HABITATS

PLANNED HABITAT ELEMENTS

ROCK TOPPER + 3D PRINTED BLOCK



ROCK TOPPER CROSS SECTION

3D PRINTED FRESHWATER BLOCK

1' 0' 1' 2'

SCALE: 1"=1'

LIVING HABITATS

Construction Outlook

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Construction Team

Ben Koepsell, PE
Project Manager
Michels

Justin Johnson
Project Superintendent
Michels

MICHELS®
CONSTRUCTION, INC.

- Energy and Infrastructure Contractor
- Family-owned company started in 1959 located in Brownsville, WI

Cody Smith
Project Engineer
Michels

Justin Chapman
Barge Foreman
Michels

Dustin Strauss
Barge Foreman
Michels

Breakwater Construction at Kellogg Creek, April 2023

- Stabilize Shoreline
- Replenish Beach
- Enhance Habitat
- Minimize Maintenance

Project Goals

- Stabilize Shoreline
- Replenish Beach
- Enhance Habitat
- Minimize Maintenance

Sand Placement at Lloyd Park Beach – Winnetka, IL

Project Goals

- Stabilize Shoreline
- Replenish Beach
- Enhance Habitat
- Minimize Maintenance

Fort Sheridan Coastal Restoration (Root Wad Placement) – Fort Sheridan, IL

Project Goals

- Stabilize Shoreline
- Replenish Beach
- Enhance Habitat
- Minimize Maintenance

Shore Protection for Private Residence – Lake Forest, IL

Implementation

Schedule

North

First:
May ‘23 – Oct ‘23

Last:
Oct ‘23 – Jul ‘24

Second:
Jun ‘23 – May ‘24

Material Procurement/Delivery - Stone

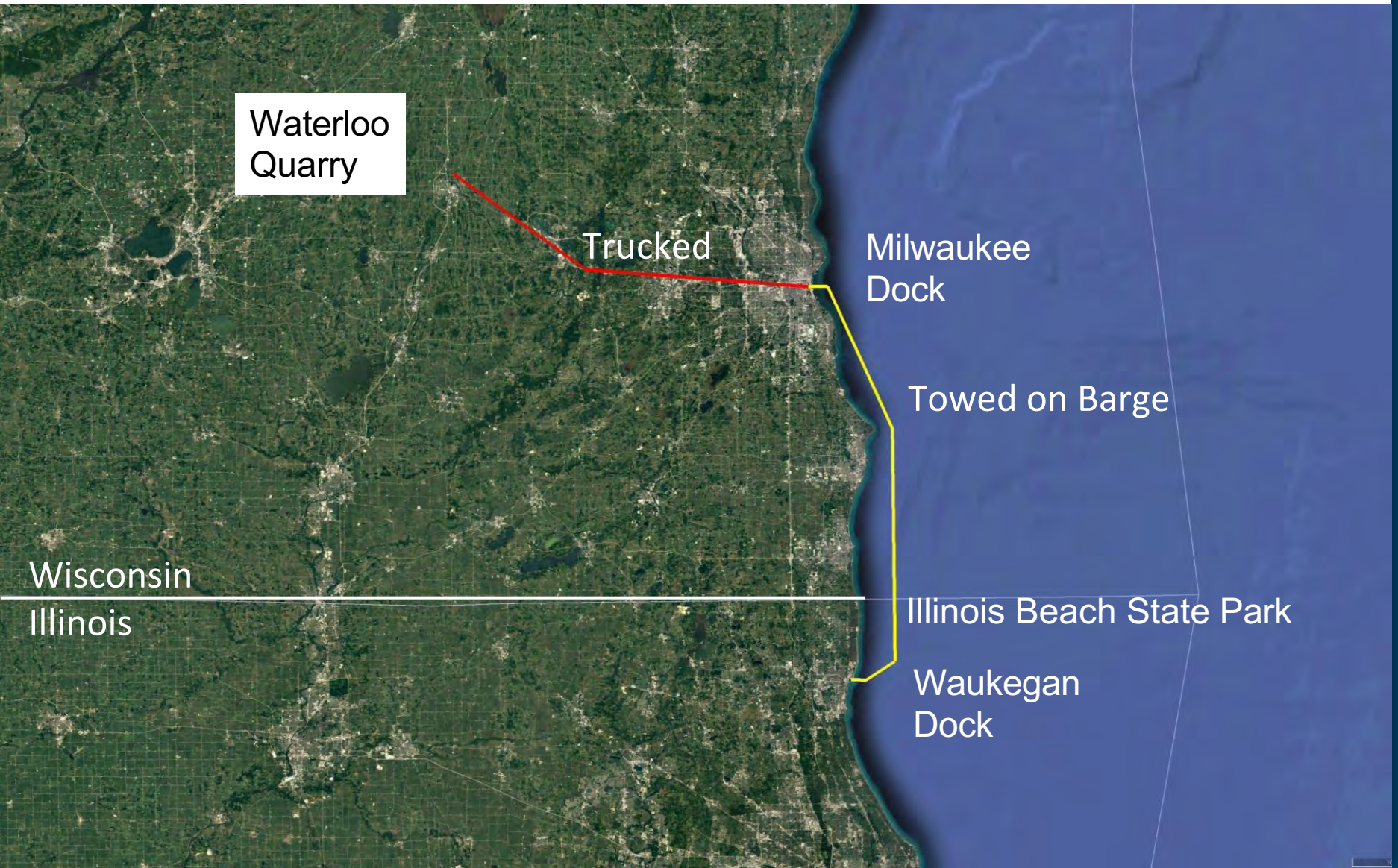
Large Stone (Armor)

- Mined in Michels Waterloo, WI Quartzite Quarry

Smaller Inner Stone (Filter & Bedding)

- Mined in Lannon, WI Dolomite Quarry

Material Procurement/Delivery - Logistics



Trucking from Waterloo Quarry to Milwaukee Dock

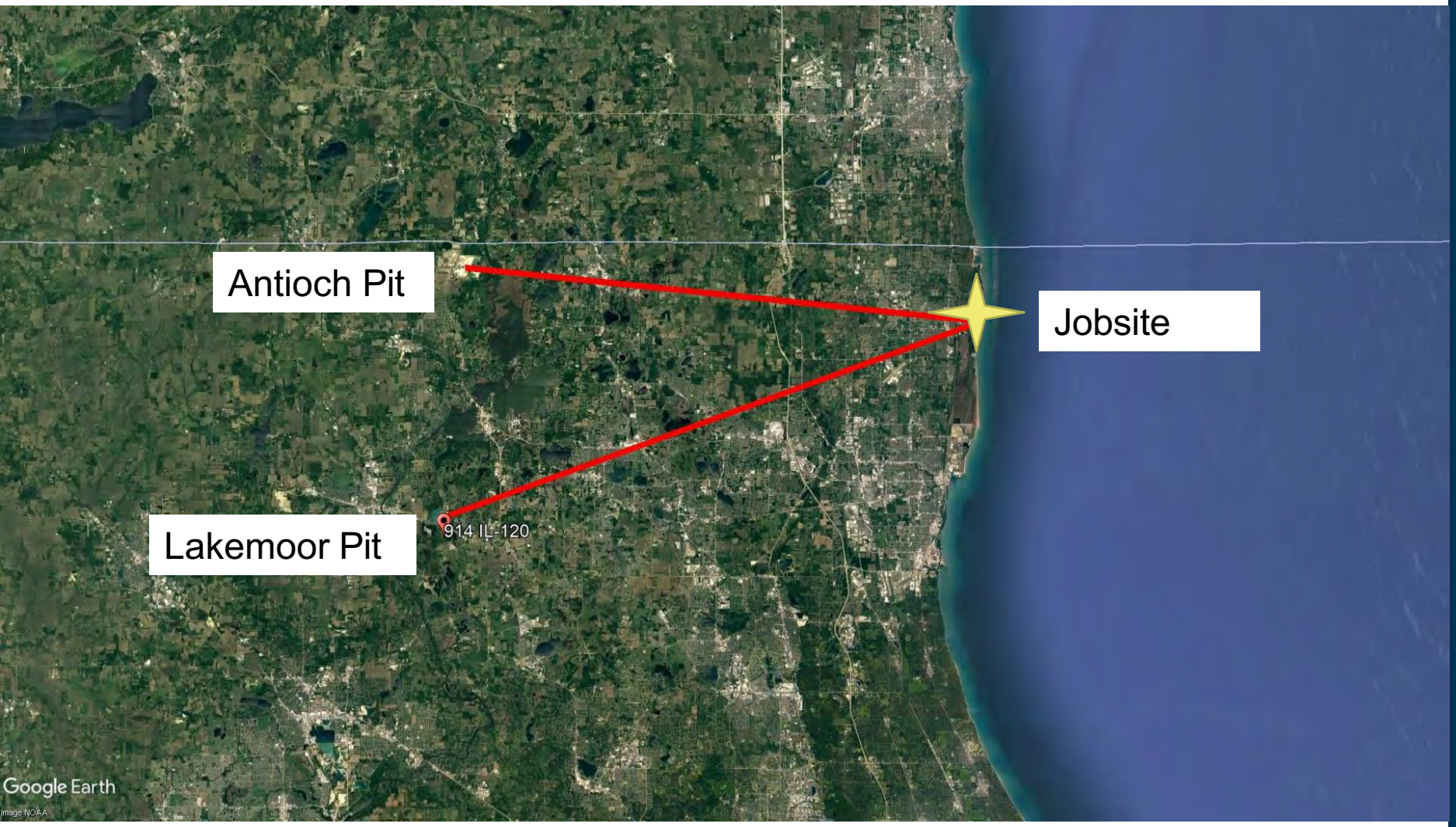
Towing from Milwaukee Dock to Waukegan Dock

Material Procurement/Delivery - Placement

Delivery of stone to jobsite via marine plant

- Tug
- Spud barge/excavator
- Material barge

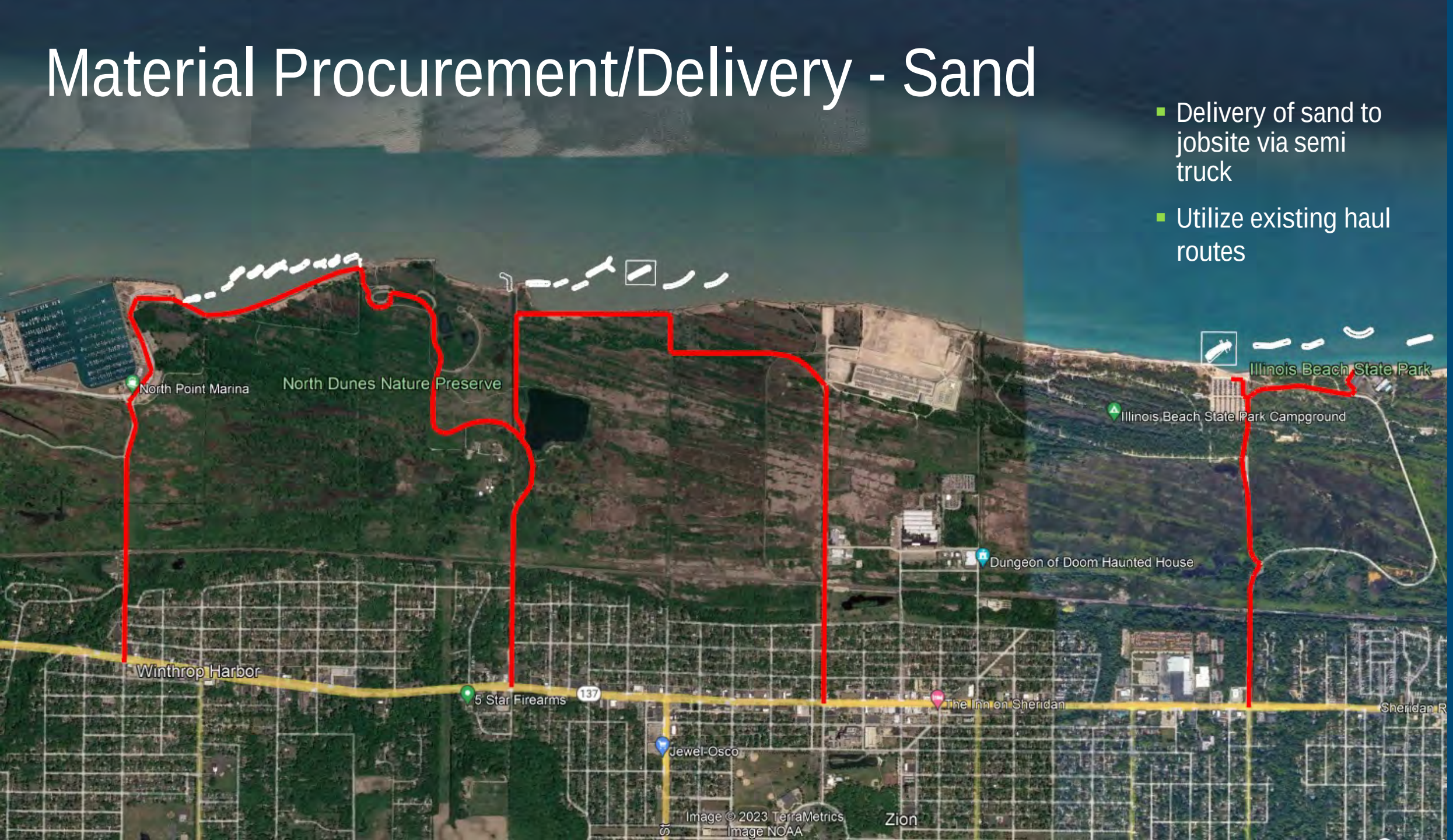
Material Procurement/Delivery - Sand



- Sourced from multiple pits
- Pits are ±20 miles from jobsite
- Annual sand production at pits exceeds yearly placement on project

Material Procurement/Delivery - Sand

- Delivery of sand to jobsite via semi truck
- Utilize existing haul routes



Material Procurement/Delivery - Sand

Placement of Sand Fill at IBSP

- Place sand on beach and grade with dozers and tracked loaders

Sand Trucking

- Sand will be trucked into the site from local sand pits
- Summer: 10-20 trucks routing 6 loads day per truck
- Winter: 20-30 trucks routing 6 loads day per truck

Contact & Project Information

- Mark Jones – Capital Development Board Project Manager
  - Email - Mark.Jones2@Illinois.gov

- All recent documents regarding Illinois Beach State Park Project will be updated on Capital Development Board's website under "bid Information"
  - https://cdb.illinois.gov/procurement/illinois-beach-state-park-shoreline-stabilization.html

Q & A