Southeastern Wisconsin

Regional Planning Commission

Regional Natural Areas Update

Technical Advisory Committee Meeting
December 13, 2024

Funding

- Funded in part by the Wisconsin Coastal Management Program and National Oceanic and Atmospheric Administration, Office for Coastal Management under the Coastal Zone Management Act, Grant #s
  - NA18NOS4190091
  - NA20NOS4190092
  - NA22NOS4190085

WISCONSIN COASTAL MANAGEMENT PROGRAM

Agenda

- 1.Introductions
  - No Motion required
- 2.Approval of October 18, 2021, Meeting Minutes
  - Motion required
- 3.Summary and discussion of the Preliminary Draft Amendment
  - Motion required
- 4. Introduction and discussion of the Draft Natural Areas and Aquatic Areas Webtools
  - Motion required
- 5. Adjournment
  - Motion required

2024 Amendment- Key elements to improve the plan and its ease of use:

- Provide more up-to-date information (i.e., new sites, lost sites, designation changes, and boundary changes) for inclusion in appropriate local and county planning reports and studies and stewardship efforts
- Need to change current hard copy map and table format to a more formal, centralized digital (i.e., boundary shapefiles with detailed attributes or mapping applications) inventory of our natural areas and their attributes to maximize use for and visibility by desired users (public and private)
- Need to update the original aquatic resource assessment schemes for lake and stream classification
- Need to better address common threats and management needs of different natural area types

2024 Amendment-Objectives

- Identify NA & CSH site changes, which have occurred since the preparation of the original 1997 plan and the 2010 Amendment
- Development of a digital geodatabase of natural areas and critical species habitat sites and their attributes to serve as a central repository for site information
- Development of new site profile summaries and maps for each natural area
- Revised and updated aquatic resource assessment schemes for lake and stream classification
- Development of an interactive webtool hosted on the Commission's website to locate natural areas and critical species habitat sites, aquatic resource locations and classification rankings, and to learn more about how to protect and manage these critical resources and download information about each of them.

2024 Amendment-Format

- Chapter 1-Introduction
- Chapter 2-Background
- Chapter 3-Status of Implementation
- Chapter 4-New Sites
- Chapter 5-Changes in Listed Species
- Chapter 6-Changes to Site Boundaries and Ranks
- Chapter 7-Recommended Changes to the Plan
- Chapter 8-Preliminary Recommendations
- Chapter 9-Final Recommendations (**to be completed**)
- Appendix A-Site Profiles (posted on Commission's Website and Webtool)

Natural Areas 2024

- 478 Natural Areas
  - 42 NA-1
  - 107 NA-2
  - 329 NA-3
- 412 CSH Sites
- 87 Geological Sites
- 15 Archeological Sites
- 11 Grassland and forest interior re-establishment sites

Natural Area Site Profiles

Cudahy Nature Preserve: Natural Area of County-Wide or Regional Significance (NA-2)
Level of Protection: High (Conservation Ownership with Site Management Plan)
Level of Threat: Medium (Invasive Species)

Size	47 Acres
Ownership	Milwaukee County
Site Management Plan	Yes
Number of Native Plant Species	178
Endangered, Threatened, or Special Concern Species	Yes, Plant and Animal

Cudahy Nature Preserve, also a State Natural Area known as Cudahy Woods, consists of a relatively large remnant tract of white oak-red oak dry-mesic forest, beech-maple northern hardwood forest, and hardwood swamp with skunk cabbage seeps. It harbors a rich ground flora that includes trout lilies (*Erythronium albidum* and *E. americanum*), Spring cress (*Cardamine bulbosa* and C. *douglassii*), toothwort (*Cardamine concatenata*), and many other species that have been extirpated from most of the surrounding area. American cancer root (*Conopholis americana*) and Beech drops (*Epifagus virginiana*), both fully parasitic plants that lack chlorophyll, are two of the more unique members of the Cudahy Woods plant community. They respectively depend on the presence of oaks (*Quercus* sp.) and American beech (*Fagus americana*) as hosts. The woods also supports many bird species during migration and the breeding season.

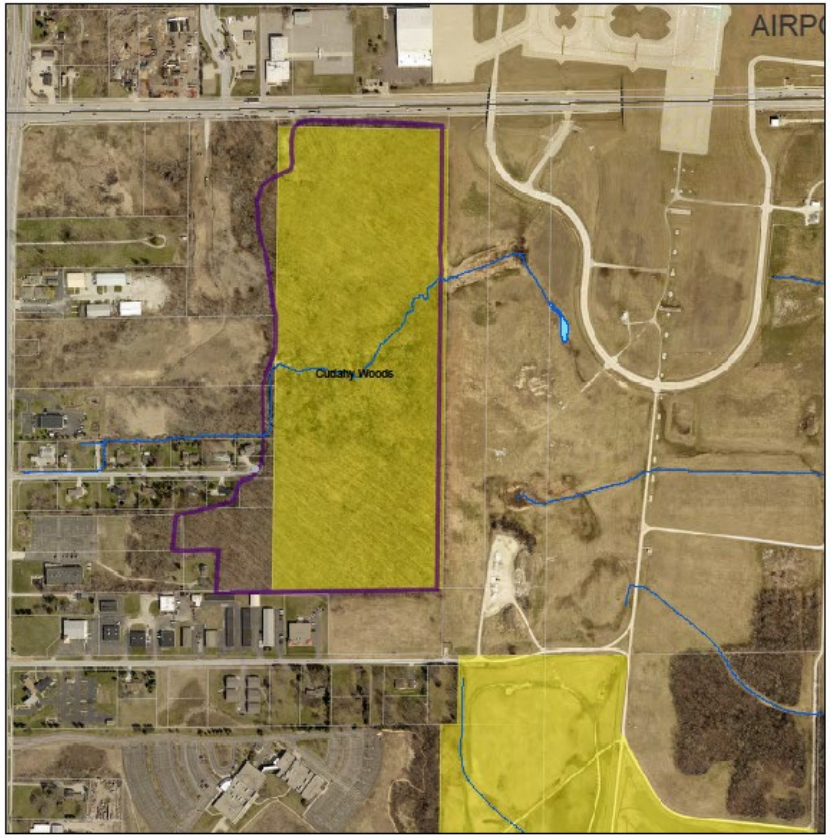
Invasive species are the primary threats to the long-term preservation of biodiversity at Cudahy Nature Preserve. There are ongoing efforts to control garlic mustard (*Alliaria petiolata*), but perhaps the greatest threats the woods' diverse and irreplaceable spring ephemeral community are exotic "bulb" species, which are actively displacing spring ephemerals in parts of the woods. Siberian squill (*Scilla siberica*) and Bossier's glory-of-the-snow (S. *luciliae*) are the most problematic, but snowdrops (*Galanthus nivale*) also poses a threat. Other invasive species present in or at the margins of the woods and warranting consideration for eradication include bush honeysuckle (*Lonicera x bella*) and common buckthorn (*Rhamnus cathartica*).

Acquisition and afforestation of adjacent properties to the west and south of the woods, which already contain some mature oaks and wetland areas, would buffer the core remnant community from surrounding development and further enhance wildlife values.

Left: White trout lily, a spring ephemeral wildflower, carpets portions of Cudahy Nature Preserve in early spring. **Right:** Invasive Bossier's glory-of-the-snow expanding in a portion of the woods. Credit: SEWRPC staff — Dan Carter

DLC
Rawson Park Woods Natural Area Profile (246040)

Map X
Cudahy Woods Natural Area Site No. 5 (NA-2)



NATURAL AREA
SURFACE WATER
STREAM
PARCEL BOUNDARY

Lands Considered to be Protected Through Public or Private Ownership Interest

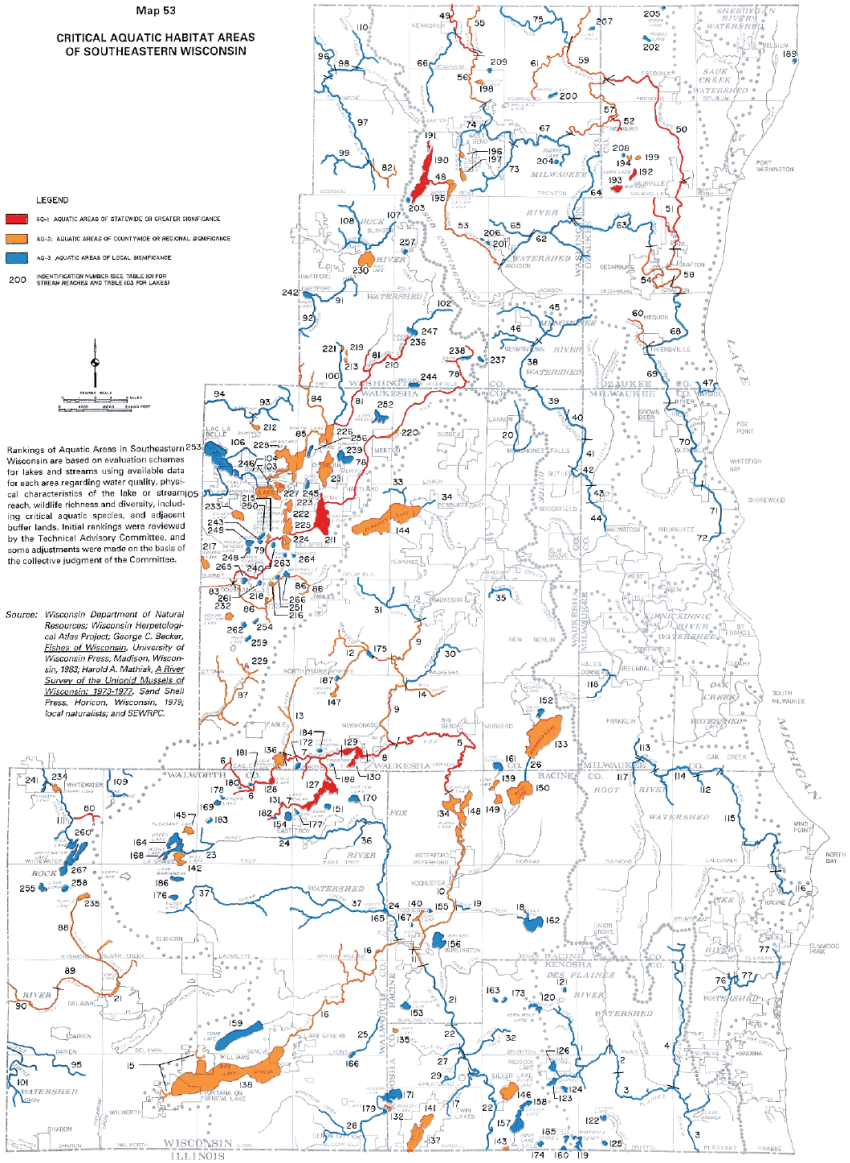
(Defined as lands owned in fee simple by Federal, State, County, and local governments; public school districts; utility, sewerage, and lake districts; and lands owned fee simple by private organizations, including land trusts, schools, conservation clubs, campgrounds and other compatable groups (some of these lands may be vulnerable to development); and, lands protected by conservation easements.)

N

0 250 500 Feet

Note: the lands within the boundaries and/or highlighted are not open to public access (for any purpose) unless otherwise noted onsite.

Aquatic Natural Areas: 1997



- Stream ranking elements
  - Water quality, morphology, connectivity, fisheries, critical species, riparian buffer
- Lake ranking elements
  - Trophic state, surface area, connectivity, fisheries, critical species, riparian buffer
- 118 Critical Stream Reaches
  - Bark, Fox, Milwaukee, Mukwonago, and Oconomowoc
- 148 Critical Lakes
  - Beulah, Big Cedar, Nagawicka, and Phantom lakes

Updating the Aquatic Natural Areas

- 2010 amendment did not include update to aquatic Natural Areas

- Since 1997 publication, several surveys, models, and metrics more widely used:
  - Lake and stream natural community model
  - Floristic quality assessment, Nichols 1999
  - Aquatic plant point-intercept protocol, Hauxwell et al. 2010
  - Macrophyte bioassessment, Mikulyuk et al. 2017
  - Biotic index for macroinvertebrates, Hilsenhoff et al. 1987
  - Macroinvertebrate index of biotic integrity, Weigel et al. 2003
  - Fisheries indices of biotic integrity, Lyons et al. 1992 – 2012
  - Fishery classification of Wisconsin lakes, Rypel et al. 2019

Aquatic Natural Areas: Assessment Schemes

- Updated assessment scheme for lakes and stream reaches with additional elements not included in the 1997 plan

- Lakes assessment scheme
  - Morphology, Water Quality, Aquatic Plants, Fishery, Riparian Buffer, Habitat Connectivity, Rare Species

- Stream reach assessment scheme
  - Morphology, Water Quality, Macroinvertebrates, Fishery, Riparian Buffer, Habitat Connectivity, Rare Species

- Assessment schemes weighed biotic elements more heavily
  - Aquatic Plants, Macroinvertebrates, Fisheries, and Rare Species

Draft Updated Lake Ranking Scheme

Score (≤100) = Morphology (≤7) + Water Quality (≤7) + Aquatic Plants (≤20) + Fisheries (≤25) + Riparian Buffer (≤6) + Habitat Connectivity (≤15) + Rare Species (≤20)

Scheme Elements	Data or Indices	Associated Data Sources
Morphology and Classification	Size Maximum Depth Lake Classification[a]	Wisconsin Department of Natural Resource (WDNR) Register of Waterbodies (ROW); WDNR Surface Water Data Viewer (SWDV)[b]
Water Quality	303(d) Impairment Listing Outstanding and Exceptional Resource Waters	SWDV
Fish	Lake fishery classification Species richness Presence of common carp	Data from Rypel et al., 2019[c] WDNR Fisheries Database
Aquatic Plants	Mean Coefficient of Conservatism[d] Species richness Percent invaded Macrophyte bioassessment[e]	WDNR Aquatic Plant Point-Intercept Database
Shoreline Buffer	Percent of shoreline buffered	SEWRPC Land Use Geodatabase
Connectivity	Number of connected natural areas Acreage of connected natural areas	Self-referential
Natural Heritage Inventory (NHI) Listings	Observations of Special Concern (SC), Threatened (THR), or Endangered (END) species	NHI Database[f]

Draft Updated Lake Ranking Scheme

- Applied ranking scheme to entire lakes
  - Lakes, millponds, reservoirs over 10 acres with a WBIC
- Ranking comprised of major elements (e.g., aquatic plants)
  - Major elements comprised of sub-elements (e.g., mean fish species richness)
- Guidance on ranking scheme point allocation:
  - 1997 Regional Natural Areas plan
  - Did not assign points to sub-elements without data
  - Calculated metrics of how rare a community was within the Region and/or the state
  - Calculated summary statistics (e.g., mean, median, quartile) to use as breakpoints

Draft Updated Stream Ranking Scheme

Score (≤100) = Morphology (≤7) + Water Quality (≤7) + Macroinvertebrates (≤20) + Fisheries (≤25) + Riparian Buffer (≤6) + Habitat Connectivity (≤15) + Rare Species (≤20)

Scheme Elements	Data or Indices	Associated Data Sources
Morphology, Modification, and Classification	Passage barriers (dams, culverts, roads) Sinuosity Stream Natural Community Model[g]	SEWRPC Land Use; SEWRPC Hydrology Geodatabase; SWDV
Water Quality	303(d) Impairment Listing Outstanding and Exceptional Resource Waters	SWDV
Macroinvertebrates	Hilsenhoff's Biotic Index[h] Species richness	SWDV; WDNR Surface Water Integrated Monitoring System (SWIMS)[i]
Riparian Buffers	Percent of reach buffered	SEWRPC Land Use Geodatabase
Connectivity	Number of connected natural areas Acreage of connected natural areas	Self-referential
Fish	Fish Indices of Biotic Integrity[j] Species richness Trout streams	SWDV; WDNR Fisheries Database
Natural Heritage Inventory (NHI) Listings	Observations of Special Concern (SC), Threatened (THR), or Endangered (END) species	NHI Database

Stream Reach Delineation

- Applied ranking scheme to stream reaches instead of entire streams
- Looked for existing stream reach delineations but didn't find suitable match
- Reach delineation process:
  - Used WDNR streamlines for WBIC system
  - Removed any streamlines passing through lakes larger than 10 acres
  - Split streamlines into reaches
    - Upstream and downstream of lakes, dams, and confluences where stream order changed
  - Each reach assigned unique ID

Draft Updated Stream Rankings

- Applied ranking scheme to each reach of 2,246 streams in Region
  - 74% of streams are only one reach long
  - Rivers with dams, lakes, and stream order changes broken into multiple reaches
    - Oconomowoc, Bark, and Scuppernong have most reaches (14 to 18)
- Ranking scheme elements and point allocation guidance similar to lakes
- Used weighted means for elements where data presented as a line feature
  - Sinuosity, stream natural communities, OERW, impairments, and trout class
  - Calculated percent of each reach and then applied ranking scheme based on percentage

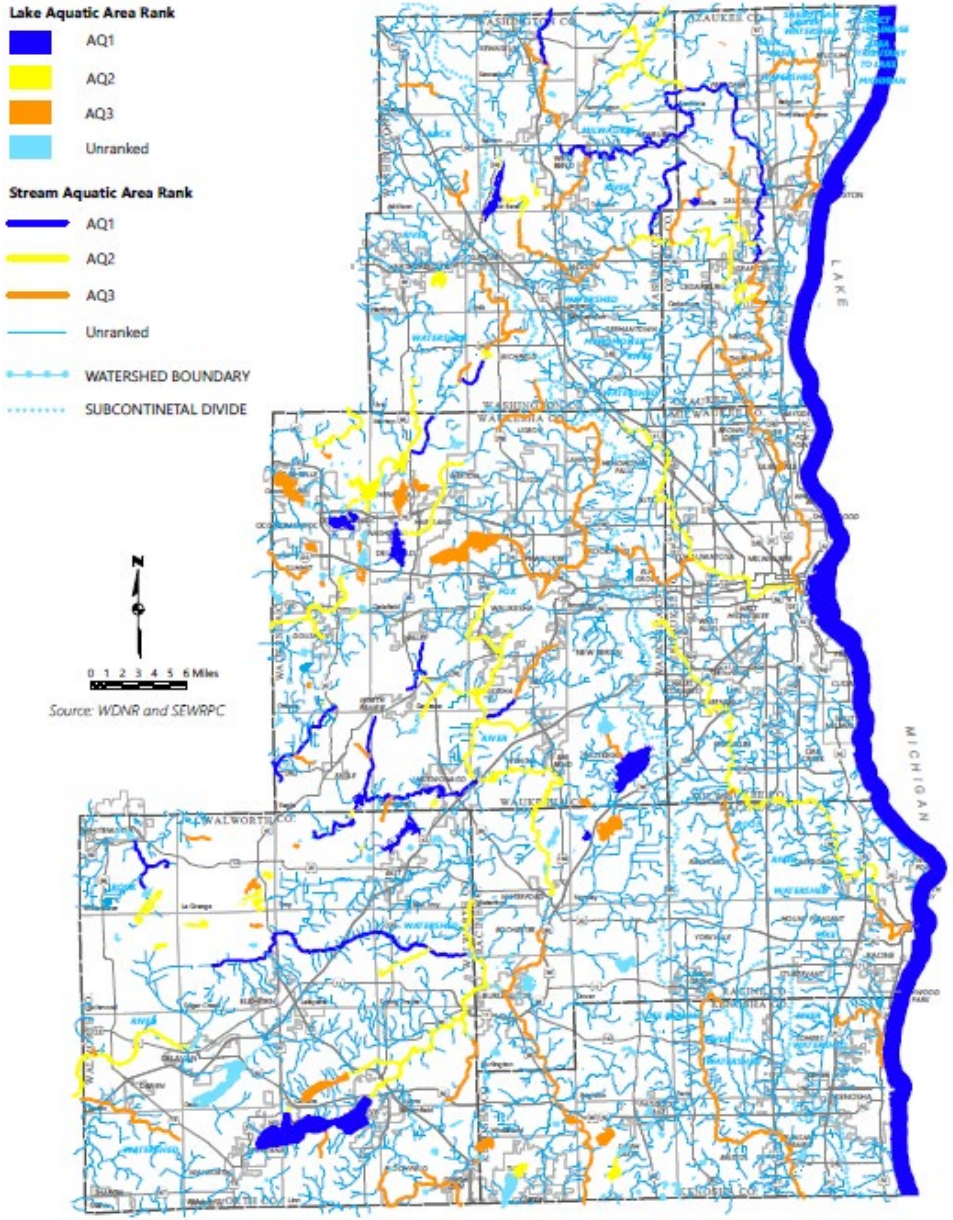
Aquatic Natural Areas

- Only highest scoring waterbodies designated as Aquatic Areas

- 54 lakes in Region identified as Aquatic Areas
  - 12 lakes as AQ-1 (including Lake Michigan)
  - 21 lakes as AQ-2
  - 21 lakes as AQ-3

- 91 stream reaches identified as Aquatic Areas
  - 17 reaches as AQ-1
  - 31 reaches as AQ-2
  - 43 reaches as AQ-3

- Aquatic Areas located in every County of the Region



Aquatic Natural Areas: Element Scores

Lake Name	WBIC	County	Morphology Score	Water Quality Score	Aquatic Plant Score	Fisheries Score	Riparian Buffer Score	Habitat Connectivity Score	Rare Species Score	Total Score	Aquatic Area Rank
Lower Phantom Lake	765800	Waukesha	2	5	8	22	0	15	14	66	AQ1
Nagawicka Lake	828000	Waukesha	7	5	16	18	0	14	6	66	AQ1
Lulu Lake	768800	Walworth	3	7	16	13	4	9	12	64	AQ1
Lake Beulah	766600	Walworth	7	5	12	21	0	7	8	60	AQ1
Mud Lake	22100	Ozaukee	3	5	17	3	6	13	10	57	AQ1
Eagle Spring Lake	768600	Waukesha/Walworth	2	5	9	13	2	14	12	57	AQ1
Waubeesee Lake	760900	Racine	5	5	17	21	0	3	4	55	AQ1
Oconomowoc Lake	849600	Waukesha	7	5	17	22	0	0	4	55	AQ1
Geneva Lake	758300	Walworth	7	5	10	22	0	8	2	54	AQ1
Cedar Lake	25300	Washington	7	5	14	17	0	6	5	54	AQ1
Big Muskego Lake	762400	Waukesha	5	5	8	17	2	10	6	53	AQ1

- Each lake and stream reach received score for each element and total score
  - Enable comparison between waterbodies as well as recognition of strengths/weaknesses

- Highest ranking waterbodies scored well in nearly every category
  - Riparian Buffer element had lowest scores for ranking and non-ranking waterbodies

Aquatic Natural Areas: Comparisons

- Aquatic Area rankings are comparable with other studies of high-quality areas

- Most ranking lakes and streams were designated as Aquatic Areas in 1997 plan
  - Includes two lakes not ranked in original plan: North Lake (Walworth) and Pretty Lake (Waukesha)

- Lake Michigan and several ranking lakes and rivers identified as Conservation Opportunity Areas in the 2015 Wisconsin Wildlife Action Plan
  - Bark, Fox, Milwaukee and its branches, Mukwonago, Oconomowoc, Sugar Creek, Turtle Creek
  - Eagle Spring and Lulu Lakes (Mukwonago River watershed)
  - Beck, Friess, Little Friess, Lowes, Malloy, McConville, and Murphy Lakes (Oconomowoc River watershed)

WDNR Healthy Watersheds, High-Quality Waters

- WDNR effort identifies high-quality waters (lakes and entire rivers) in the state

- High-quality waters meet 2 of the following 3 criteria:

- Criteria Area 1: Unique and Rare Natural Communities
  - State Natural Areas (waters within and adjacent)
  - Trout Streams and/ or springs
  - Outstanding and Exceptional Resource Waters
  - Wild Rice Waters (GLIFWC/WDNR 2019 List)
  - Waters in ecologically significant coastal wetlands along Lakes Michigan and Superior as identified in the Coastal Wetlands of Wisconsin
  - Federal or state waters designated as wild or scenic rivers
  - 2-Story fishery lakes with at least one non-stocked native coldwater species
- Criteria Area 2: Water Quality Standards
  - Attaining uses and currently described as "healthy" (Category 2a and 2b Waters)
- Criteria Area 3: Biotic Integrity
  - Good and/or Excellent macroinvertebrate IBI or fish IBI scores if a stream or river
  - A rank of "attaining" or "Good" using the Macrophyte Assessment of Condition for Lakes (Mikulyuk et al. 2017)

Report: https://dnr.wisconsin.gov/sites/default/files/topic/SurfaceWater/HWHQW_TechReport_NoEGAD.pdf

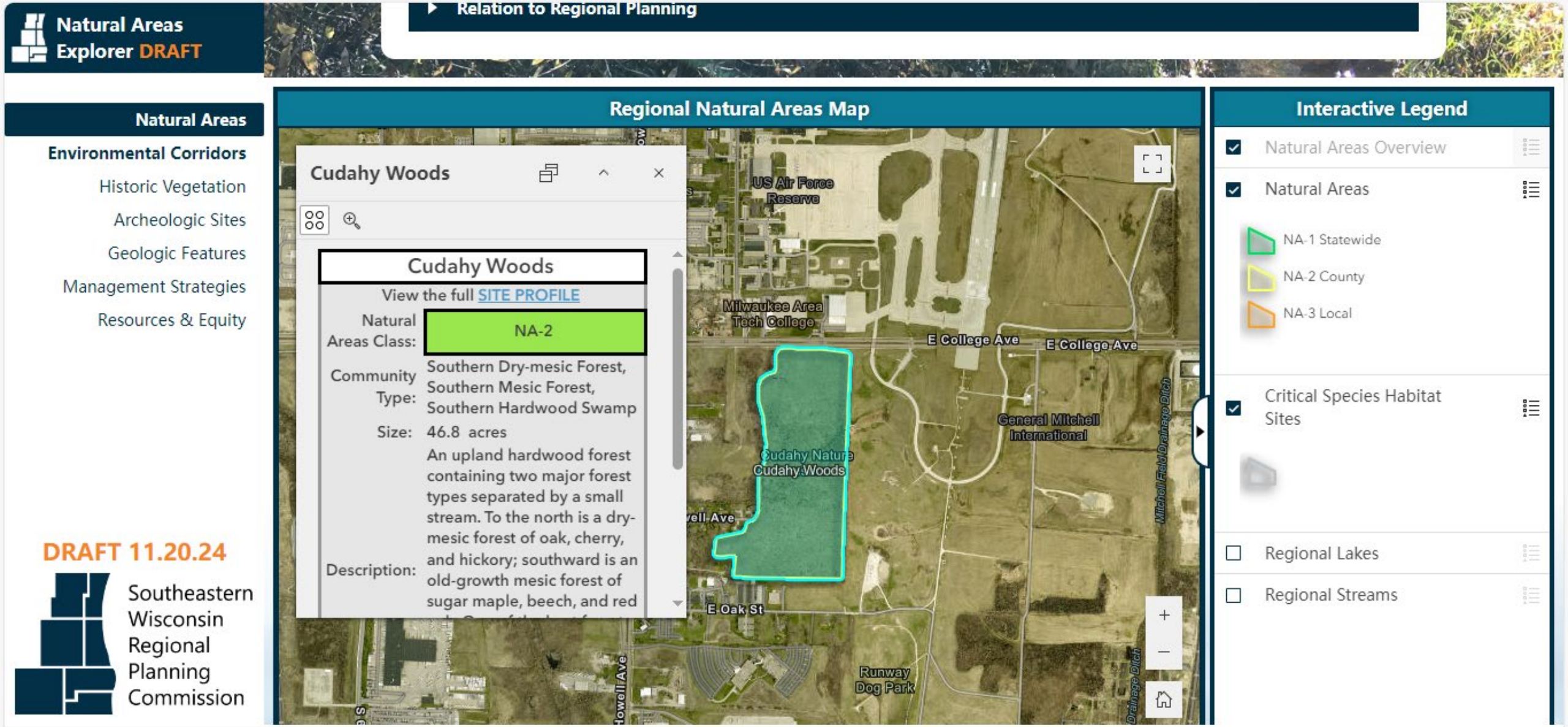
Aquatic Natural Areas: Comparisons

- 43% of ranking lakes and 38% of ranking streams are also HQW
  - Lakes (HQW and AQ-1)
    - Big Cedar, Beulah, Eagle Spring, Geneva, Nagawicka, Lulu, Mud (Ozaukee), Oconomowoc
  - Rivers/Streams (HQW and AQ-1)
    - Bluff, Genesee, Jericho, North Branch Cedar, and Whitewater Creeks
    - East Branch Milwaukee, Milwaukee, Mukwonago, Oconomowoc, South Branch Genesee Rivers

- Exceptions
  - Big Muskego and Lower Phantom are AQ-1, but not ranked as HQW
  - Pebble Brook and middle Fox River are top ten stream Natural Areas, but not ranked as HQW

Questions on Aquatic Areas?

Natural Areas Explorer Webtool



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Southeastern Wisconsin Regional Planning Commission

Timeline for Completion

- Dec 13, 2024-TAC
- Dec 19, 2024--Public Meeting (virtual) to present & obtain comments draft PR-42 2nd Amendment Plan and Webtool
- Dec 12- Jan 10, public comment period open
- Jan 20-24, final TAC (approve final draft PR-42 2nd Amendment Plan and Webtool)
- Feb 2025—Commission's Planning and Research Committee— approve PR-42 2nd Amendment Plan draft and webtool
- March 2025—Commissioner's Quarterly Meeting—approve PR-42 2nd Amendment Plan draft and webtool
- April-May 2025 Publish final plan on Commission's website

Thank You

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