Characterization of PORTS Ecological Assets: for Conservation Management Planning

Voinovich School of Leadership and Public Affairs

Presented by Gary Conley

PORTS FUTURE

Role of the Voinovich School and Ohio University in the Demolition and Decontamination of the DOE PORTS Nuclear Enrichment Facility near Piketon, Ohio

- Tasks support the DOE EM commitment to community engagement and informed decision-making.
- Tasks contribute to efforts to expedite cleanup activities at PORTS in a more cost effective manner.
- Tasks strive to employ innovations to advance the science of cleanup at the site and inform other DOE cleanup activities around the nation.

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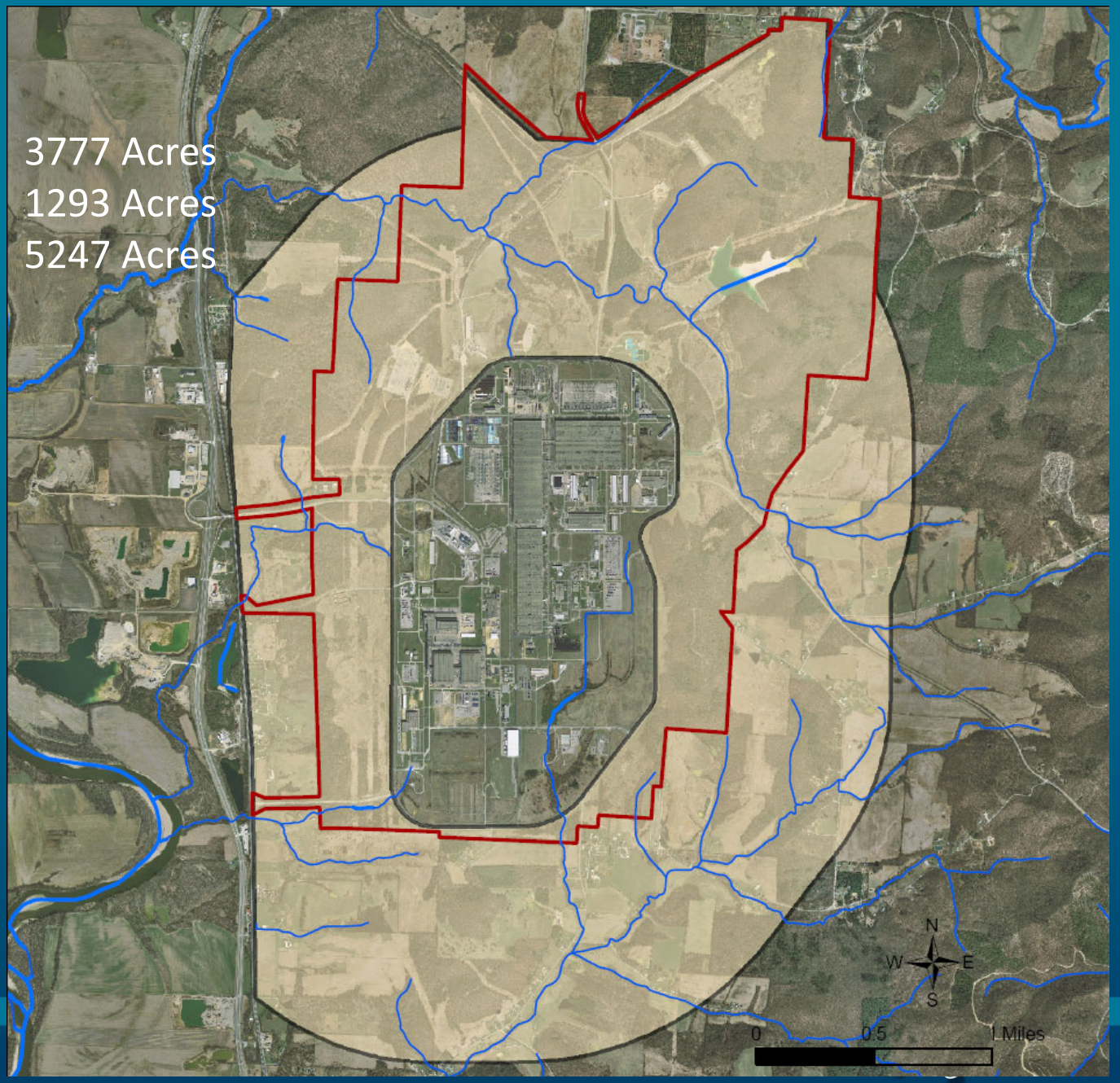
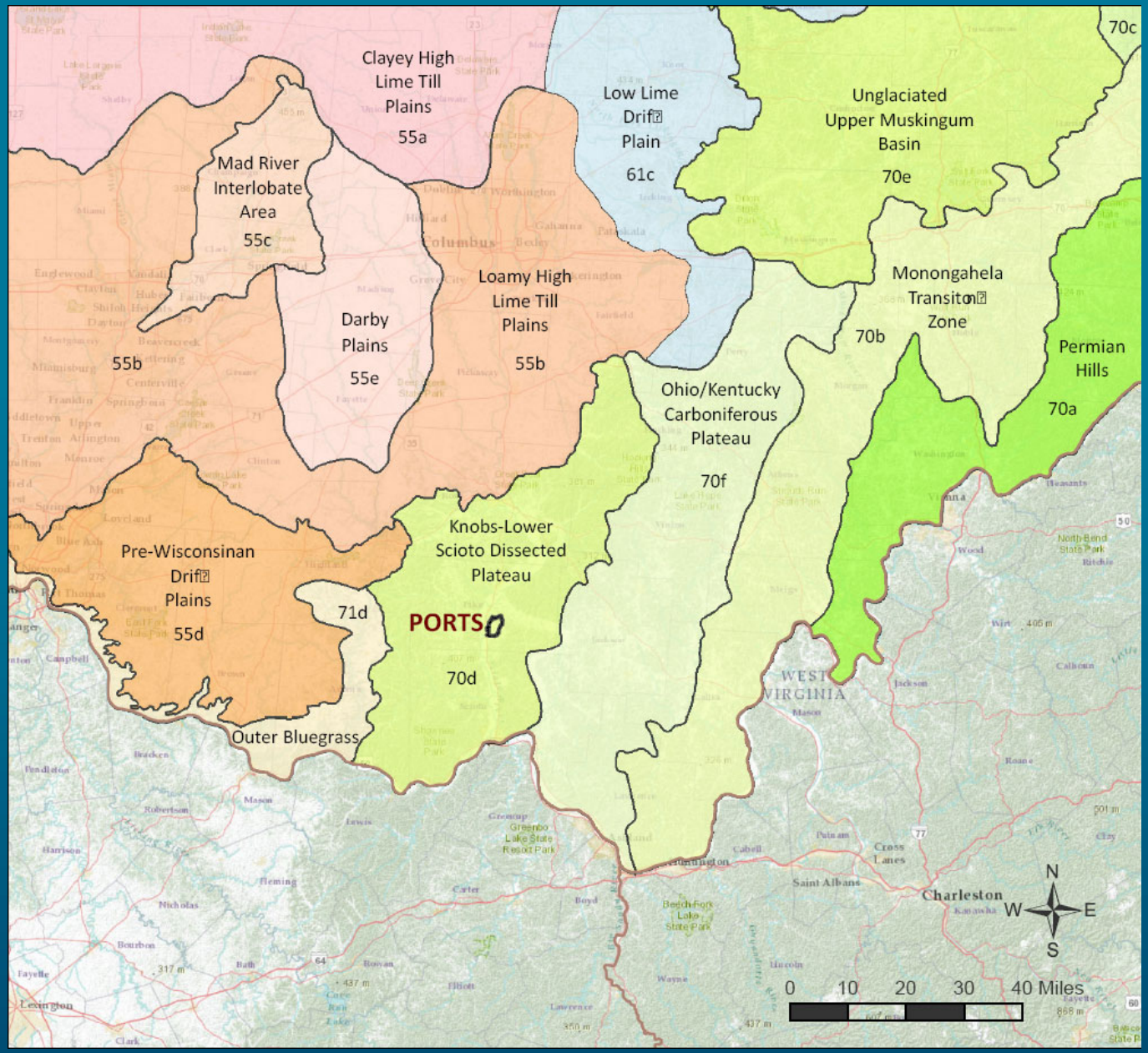
Habitat Characterization Study Area

PORTS Lands: 3777 Acres
Within Perimeter Road: 1293 Acres
Study Area: 5247 Acres





USEPA, 2011

Ecoregion Characteristics

- Level III - Western Allegheny Plateau
- Level IV – Knobs-Lower Scioto Dissected Plateau
- Unglaciated uplands with mixed oak and mesophytic forests
- Ice age effects evident in floodplains with bottomland hardwood forests and agriculture

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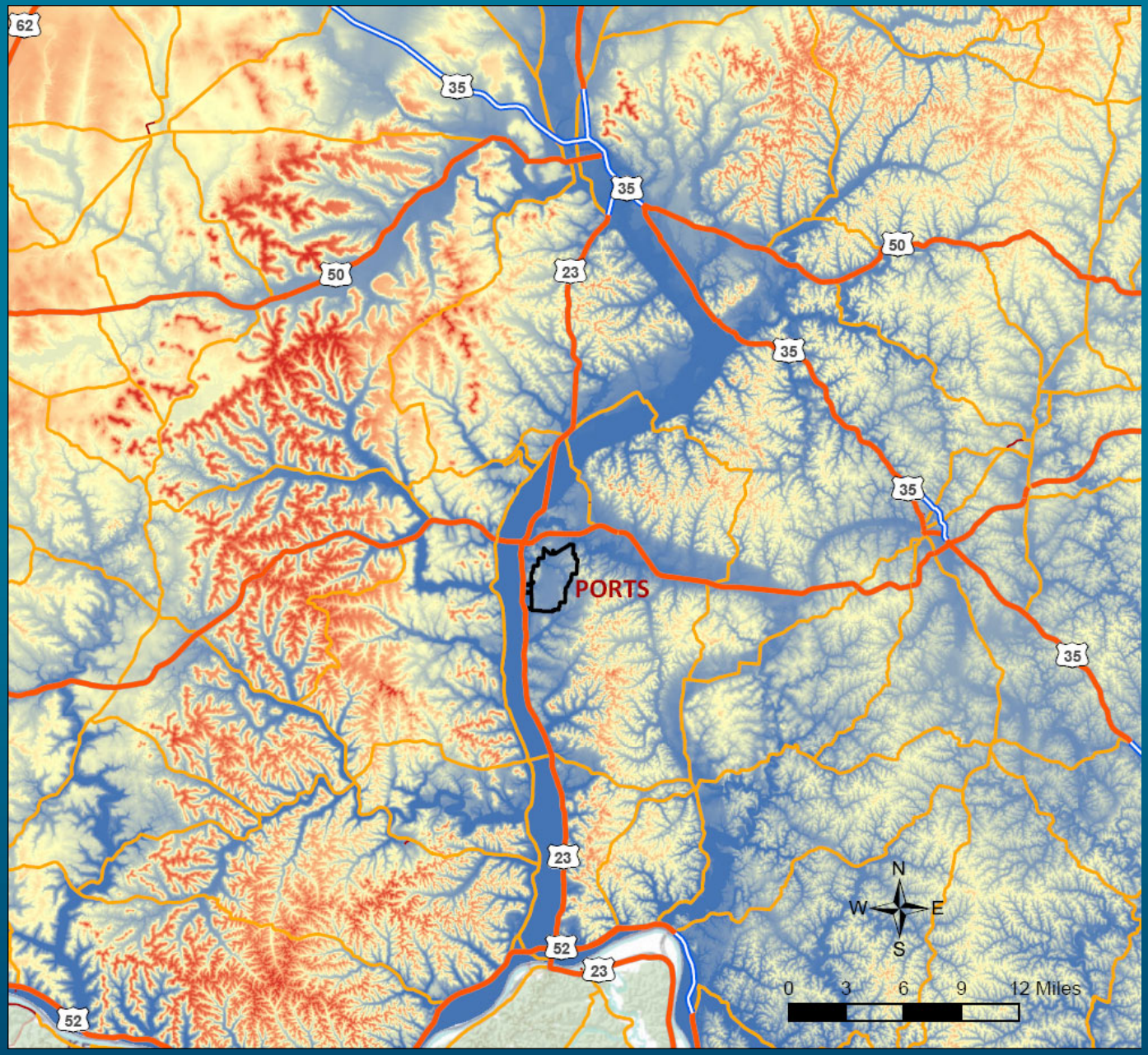

OSIP, 2007

Regional Elevation Characteristics

- Dissected steep ridges
- High relief topography

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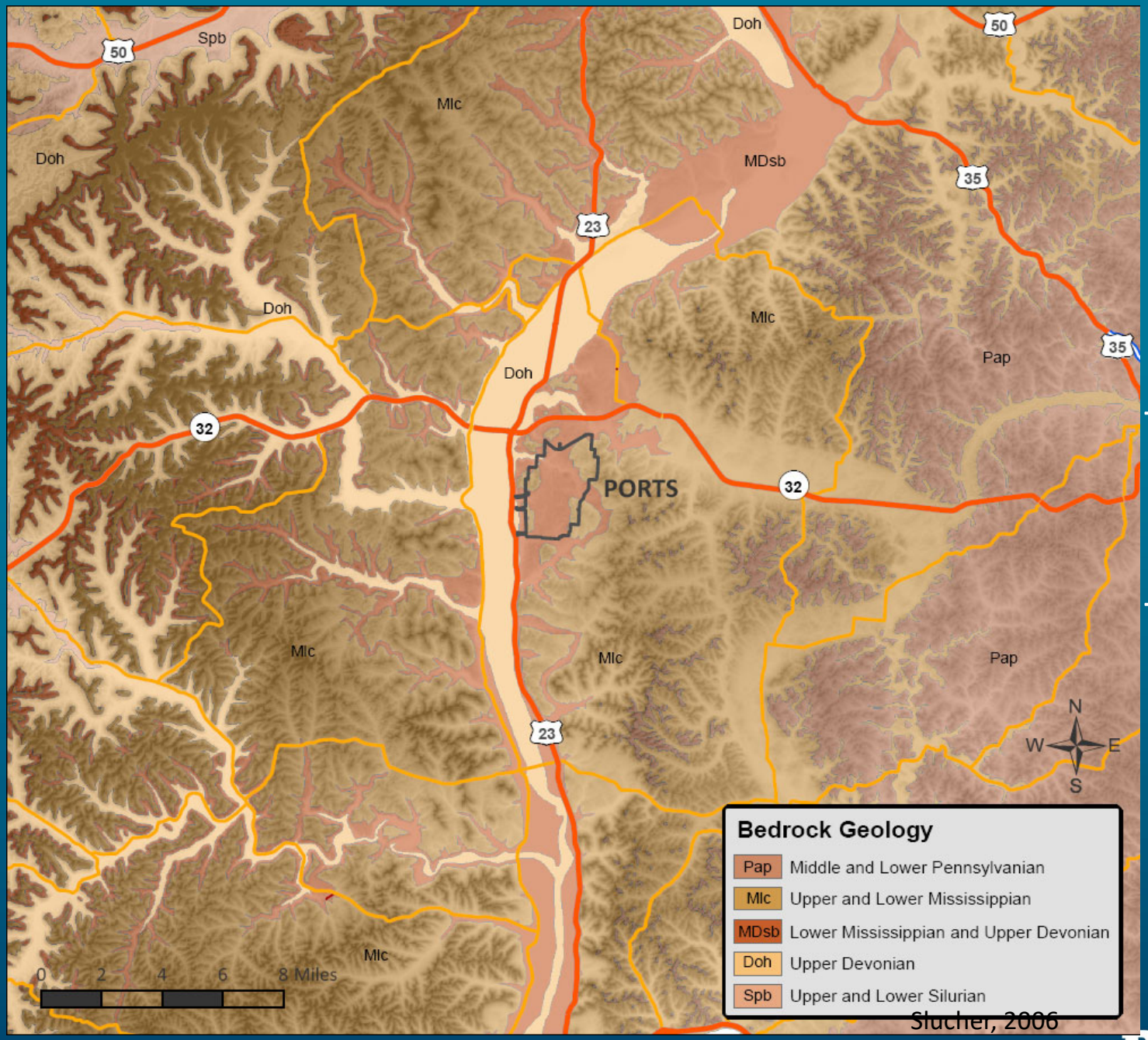
Dominant Bedrock Geology



Slucher, 2006

- Underlain mostly by Mississippian-age shale and sandstone
- Regionally varying surface geology

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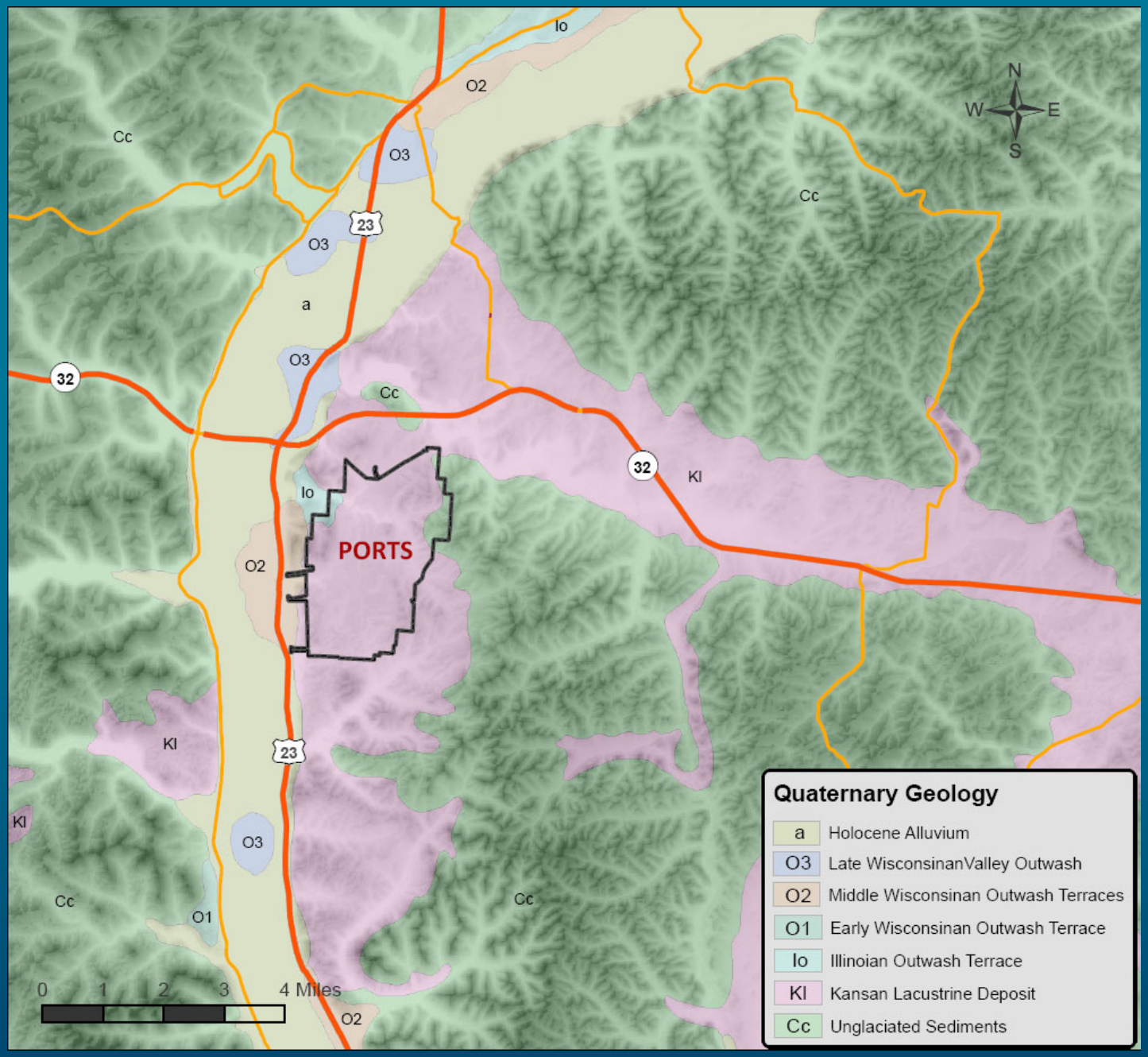
Dominant Surface Geology



Powers, 2004

- Complex history of Quaternary geology due to the procession of continental glaciers
- Relict habitats
- Unique habitats

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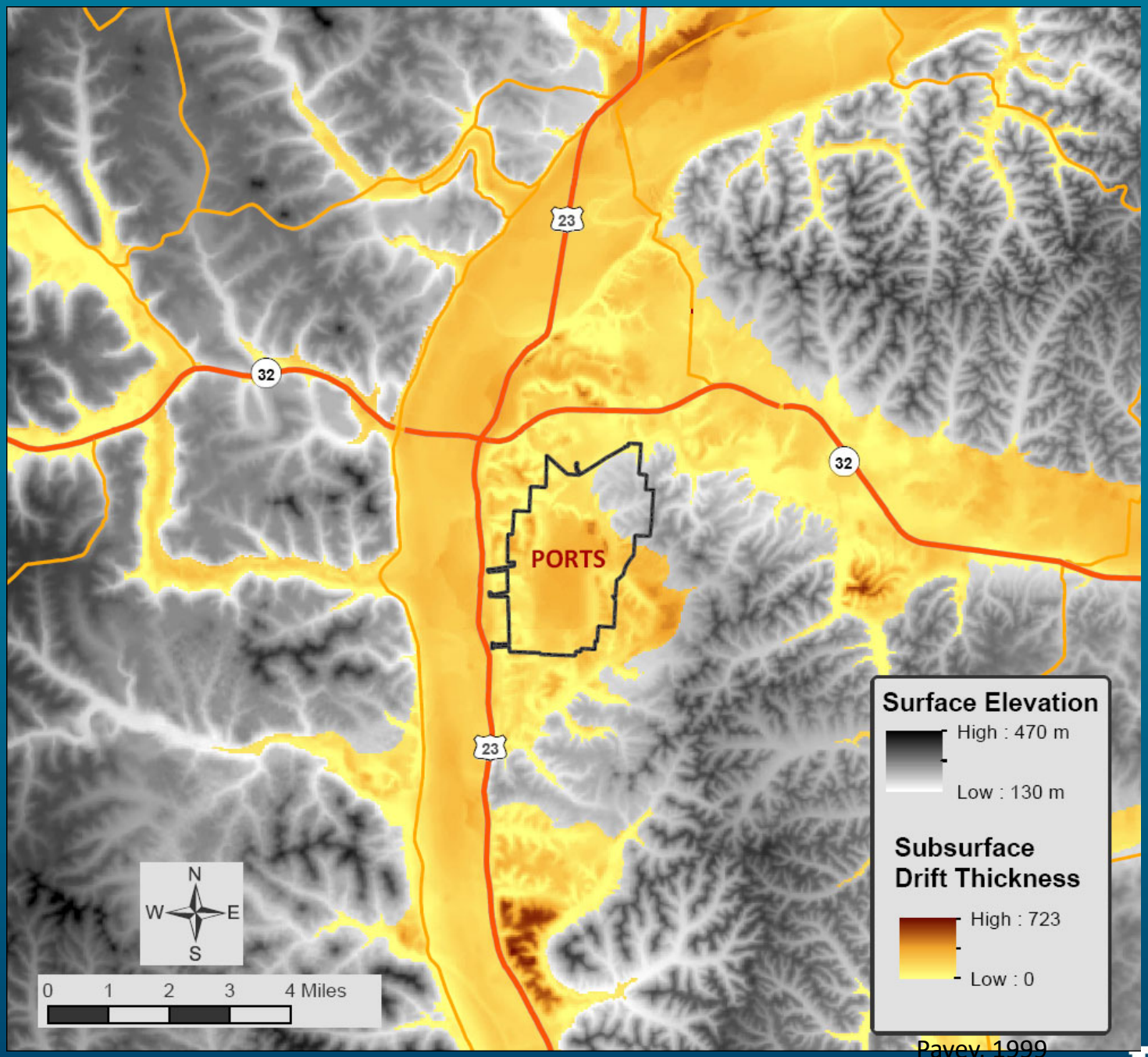
Regional Subsurface Characteristics

- Thickness of glacial sediments can greatly influence potential vegetational composition



Pavey, 1999

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Habitat Characterization

- What is Habitat? (Micro-scale)
  - Physical and geochemical setting
  - Abiotic and Biotic Resources
- Ecological Setting and Function? (Meso-scale)
  - Patchwork Mosaic
  - Ecosystem Services
- Disturbance Legacy
- Climatic Climax Vegetation

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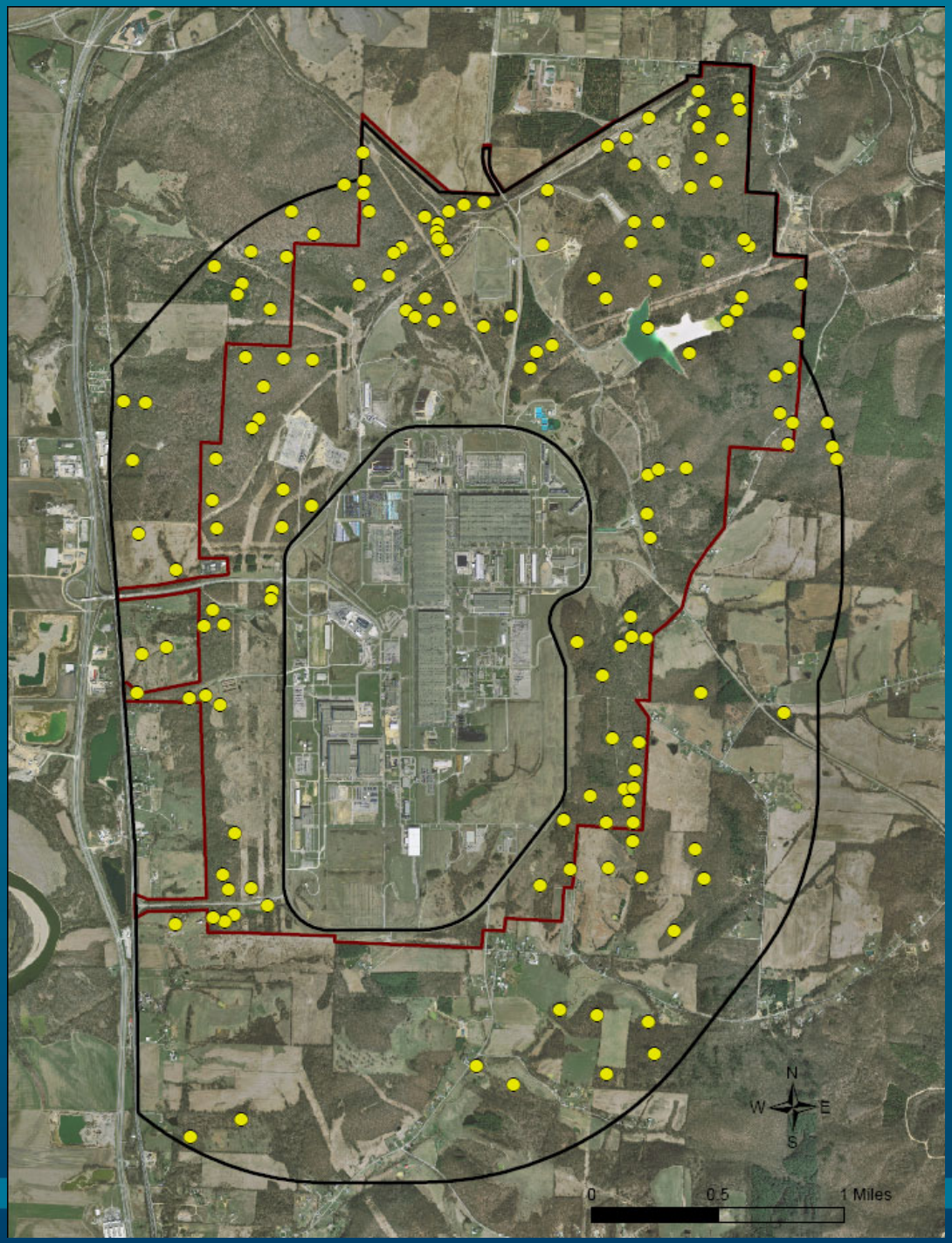

Quantitative Field Sampling 2011-2012

- 152 Habitat evaluation plots
- 594 Vegetation survey points

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- 361 Woody vegetation samples collected
- 360 Field location points identified for:
  - Unique plants or features
  - Wildlife signs and sightings
  - Field-truthing map locations

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Forested Habitat

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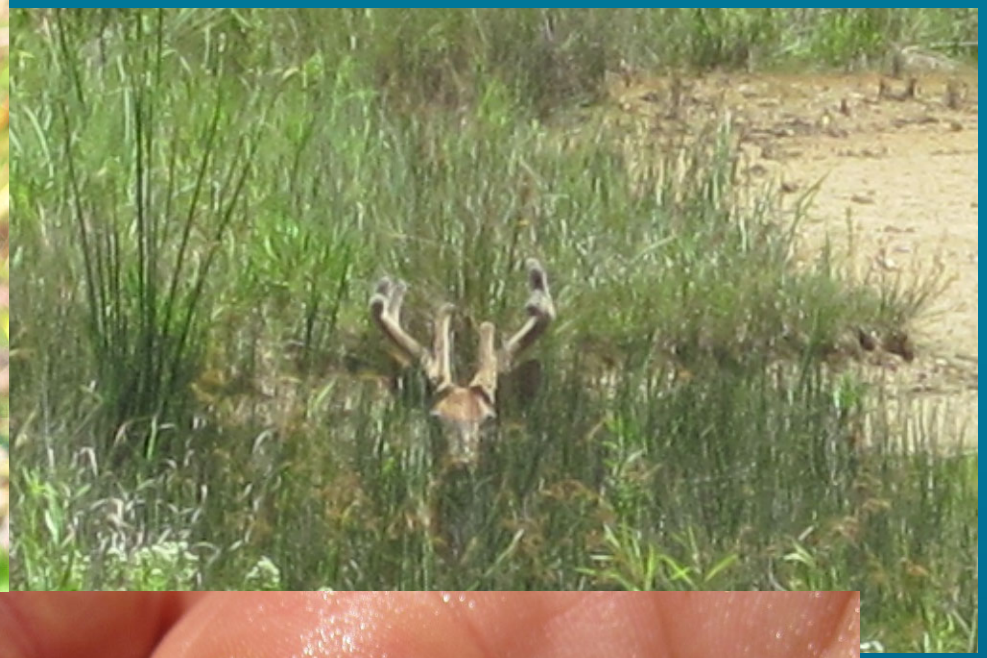
Palustrine Habitat



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Successional Habitats

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Upland Habitats

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Riparian and Lowland Habitats

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Successional Habitats and Anthropogenic Features

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Managed Habitats/Features

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Plants of Interest


Rough Blazing Star


Pink Lady's Slipper


Adder's-Tongue Fern


Netted-Chain Fern


Tway-blade Orchid


Rattlesnake Plantain

Plant Species

- Nearly 600 vascular plant species field- identified in 594 sample plots during this study
- Several are listed on State RTE list, but none from the Federal list were discovered
- Species List is the basis for habitat valuations, polygon classification, comparisons, wildlife habitat modeling and land planning recommendations
- Captured ~80% of all of the species that may be present in the study area

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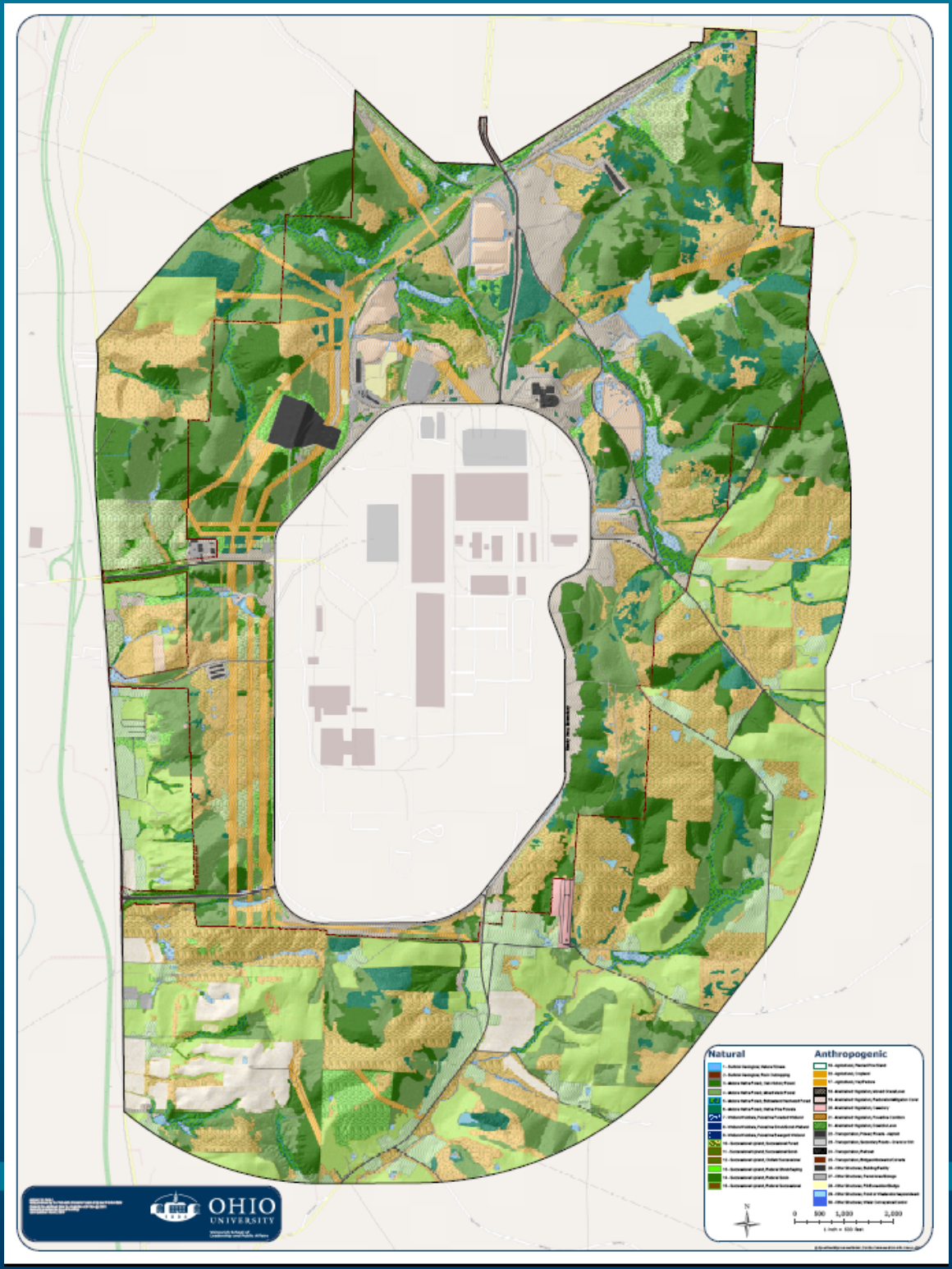
Species List

	A	B	C	D	E	F	G	H	I	J	K	L
1	Date	Sample #	*Taxon*	Author	Common Name	Synonomy	Family	CODE	Nativity	Tolerance	Wetland Indicator	C of C
2	6/7/11	207E	*Achillea millefolium*	L.	Common Yarrow		Asteraceae	ACMI2	native	tolerant	FACU	1
3	6/5/11	RLW1	*Acer negundo*	L.	Boxelder		Aceraceae	ACNE2	native	midrange	FAC+	3
4	9/27/11	331A	*Actaea pachypoda*	Elliot	White Baneberry		Ranunculaceae	ACPA	native	sensitive	UPL	7
5	5/13/11	274B	*Acer rubrum*	L.	Red Maple		Aceraceae	ACRU	native	tolerant	FAC	2
6	9/29/11	350A	*Acer saccharinum*	L.	Silver Maple		Aceraceae	ACSA2	native	midrange	FACW	3
7	5/13/11	274A	*Acer saccharum*	Marsh.	Sugar Maple		Aceraceae	ACSA3	native	midrange	FACU-	5
8	7/15/11	279A	*Acalypha virginica*	L.	Virginia Threeseed Mercury		Euphorbiaceae	ACVI	native	tolerant	FACU-	0
9	6/17/11	*210A*	*Aesculus glabra*	Willd.	Ohio Buckeye		Hippocastanacea	AEGL	native	sensitive	FACU+	6
10	5/25/11	207C	*Ageratina altissima*	(L.) King & H. R	White Snakeroot	Eupatorium rugos	Asteraceae	AGAL5	native	midrange	FACU	3
11	8/19/11	RLW_Field	*Agrostis gigantea*	L.	Redtop-grass	Agrostis alba	Poaceae	AGGI2	adventive	tolerant	FACW	0
12	6/5/11	RLW2	*Agrostis hyemalis*	(Walter) Britto	Winter Bentgrass		Poaceae	AGHY	native	midrange	FAC	3
13	9/9/11	RWL	*Agalinis linifolia*	Nutt.	Flaxleaf False foxglove		Scrophulariaceae	AGLI2				
14	9/27/11	GDC	*Agastache nepetoides*	(L.) Kuntze	Yellow Giant Hyssop		Lamiaceae	AGNE2	native	midrange	FACU	4
15	8/26/11	220A	*Agimonia parviflora*	Aiton	Harvestlice		Rosaceae	AGPA6	native	tolerant	FAC	2
16	6/15/11	230A	*Agrostis perennans*	(Walter) Tuck.	Autumn Bentgrass		Poaceae	AGPE	native	midrange	FACU	4
17	9/13/11		*Agalinis purpurea*	(L.) Pennell	Purple False Foxglove	Gerardia purpure	Scrophulariaceae	AGPU5	native	sensitive	FACW-	6
18	9/15/11	213A	*Agrimonia rostellata*	Wallr.	Beaked Agrimony		Rosaceae	AGRO3	native	midrange	FACU	5
19	9/29/11	GDC	*Agastache scrophulariifolia*	(Willd.) Kuntze	Purple Giant Hyssop		Lamiaceae	AGSC	native	midrange	UPL	4
20	9/13/11	246A	*Agalinis tenuifolia*	(Vahl) Raf.	Slenderleaf False Foxg	Gerardia tenuifol	Scrophulariaceae	AGTE3	native	midrange	FAC	4
21	9/27/11	GDC	*Ailanthus altissima*	(Mill.) Swingle	Tree-of-Heaven		Simaroubaceae	AIAL	adventive	tolerant	FACU-	0
22	8/26/11	220A	*Alopecurus pratensis*	L.	Meadow Foxtail		Poaceae	ALPR3	adventive	tolerant	FACW	0
23	8/26/11	221B	*Alisma subcordatum*	Raf.	American Water Plantain		Alismataceae	ALSU	native	tolerant	OBL	2
24	5/25/11	207B	*Allium vineale*	L.	Wild Garlic		Liliaceae	ALVI	adventive	tolerant	FACU-	0
25	8/26/11	220A	*Ambrosia artemisiifolia*	L.	Annual Ragweed		Asteraceae	AMAR2	native	tolerant	FACU	0
26	5/13/11	274A	*Amelanchier arborea*	(Michx.f.) Fern	Eastern Serviceberry		Rosaceae	AMAR3	native	midrange	FAC-	5
27	5/25/11	207B	*Amphicarpaea bracteata*	(L.) Fernald	American Hogpeanut		Fabaceae	AMBR2	native	midrange	FAC	4
28	10/5/11	349A	*Ampelopsis cordata*	Michx.	Heartleaf Peppervine		Vitaceae	AMCO2	native	sensitive	FAC+	7
29	8/10/11	251A	*Antennaria plantaginifolia*	(L.) Richardson	Women's Tobacco		Asteraceae	ANPL	native	tolerant	UPL	1
30	6/7/11	207E	*Antennaria solitaria*	Rydb.	Singlehead Pussytoes		Asteraceae	ANSO	native	midrange	UPL	3
31	8/26/11	230B	*Andropogon virginicus*	L.	Broomsedge Bluestem		Poaceae	ANVI2	native	midrange	FACU	3
32	8/19/11	RLW_Field	*Apios americana*	Medik.	Groundnut		Fabaceae	APAM	native	midrange	FACW	3
33	6/7/11	207E	*Apocynum cannabinum*	L.	Indianhemp		Apocynaceae	APCA	native	tolerant	FACU	1
34	9/27/11	GDC	*Aplectrum hyemale*	(Muhl. Ex Will	Puttyroot		Orchidaceae	APHY	native	sensitive	FAC	7
35	6/5/11	RLW1	*Arnoglossum atriplicifolium*	(L.) H. Rob.	Pale Indian Plantain		Asteraceae	ARAT	native	sensitive	UPL	6
36	10/5/11	GDC	*Arabis canadensis*	L.	Sicklepod		Brassicaceae	ARCA	native	midrange	UPL	5
37	9/29/11	350A	*Arctium minus*	Bernh.	Lesser Burdock		Asteraceae	ARMI2	adventive	tolerant	FACU-	0
38	8/29/11	211B	*Aristolochia tomentosa*	Sims	Wooly Dutchman's Pipe		Aristolochiaceae	ARTO3	adventive	tolerant	FAC	0
39	6/17/11	*265B*	*Asclepias hirtella*	(Pennell) Woo	Green Milkweed		Asclepiadaceae	ASHI	native	sensitive	UPL	8
40	8/19/11	RLW_Field	*Asclepias incarnata*	L.	Swamp Milkweed		Asclepiadaceae	ASIN	native	midrange	OBL	4
41	9/28/11	331C	*Asplenium montanum*	Willd.	Mountain Spleenwort		Aspleniaceae	ASMO2	native	sensitive	UPL	7
42	5/13/11	None	*Asplenium platyneuron*	(L.) Britton, Ste	Ebony Spleenwort		Aspleniaceae	ASPL	native	midrange	FACU	3



Habitat Characterization Results

- 32 Cover classes identified
  - 15 Natural classes
  - 17 Anthropogenic
- 2185 Individual habitat patches mapped

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Wildlife signs and sightings

Insects


Spiny Oak-slug Moth

Great Spangled Fritillary


Bee-mimic Robber Fly


Protean Shieldback Katydid Nymph


Larger Empty Oak Apple Gall Wasp


Hercules Beetle

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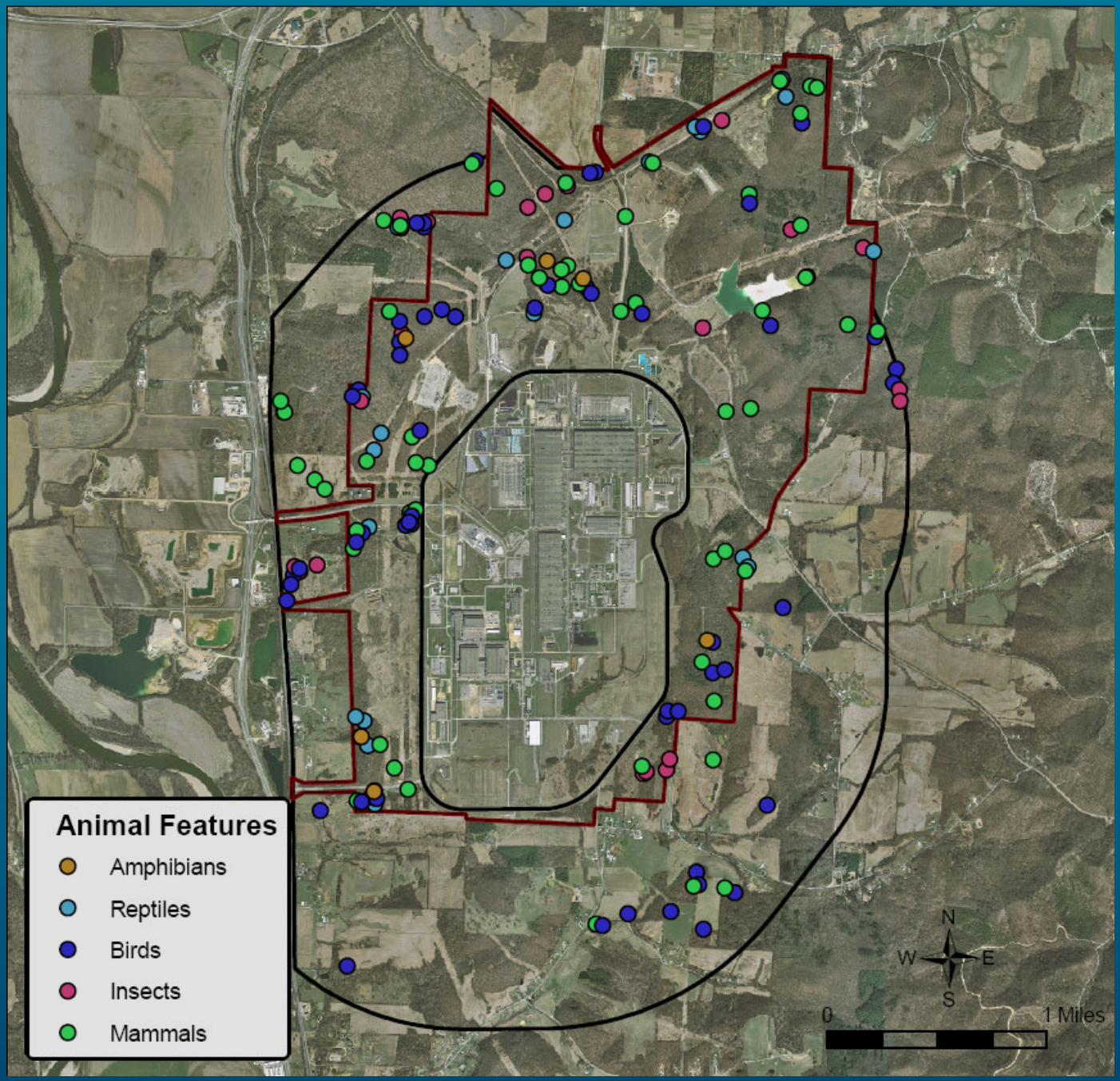
Field Observations of Wildlife



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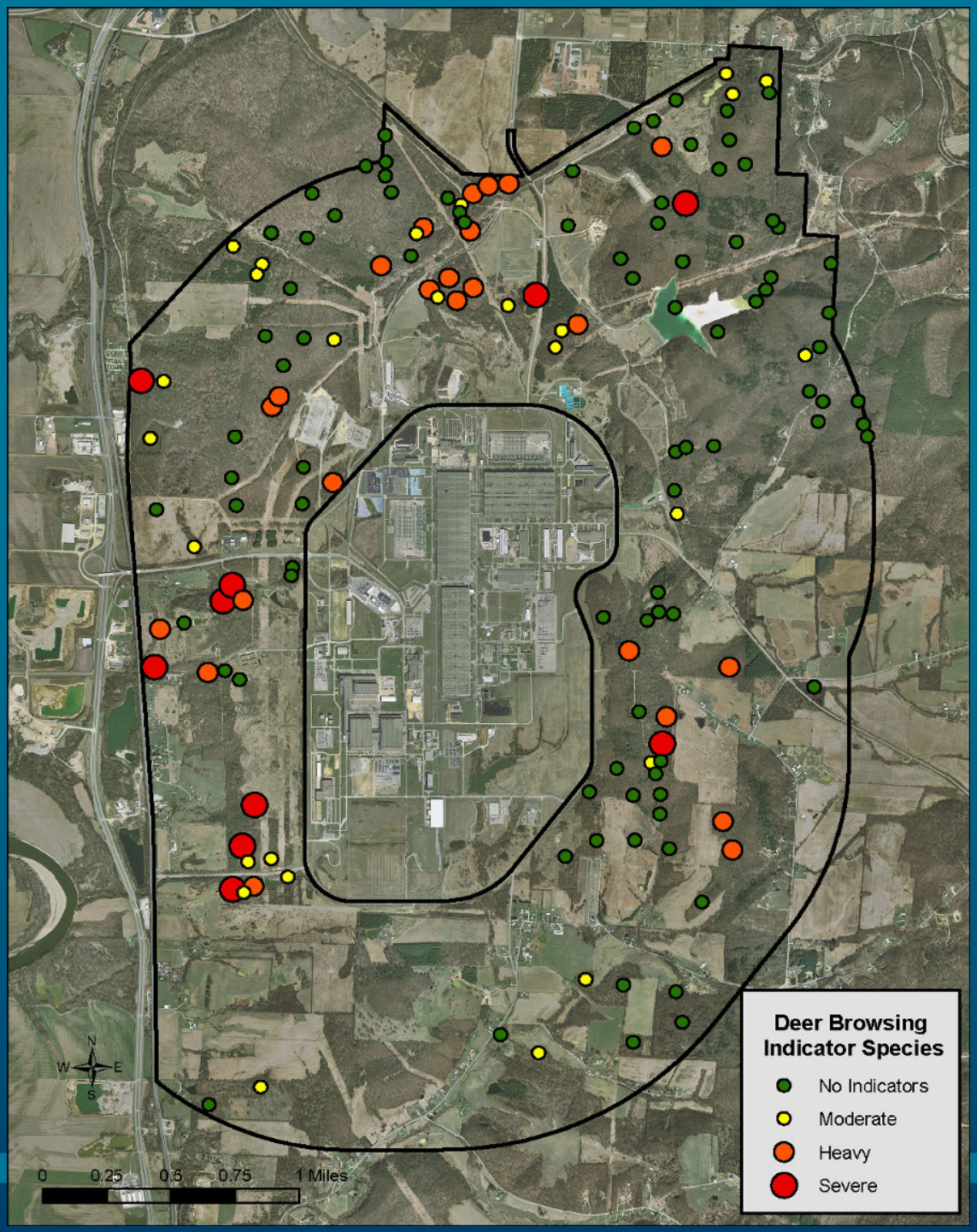

Species-Based Evidence of Deer Browsing

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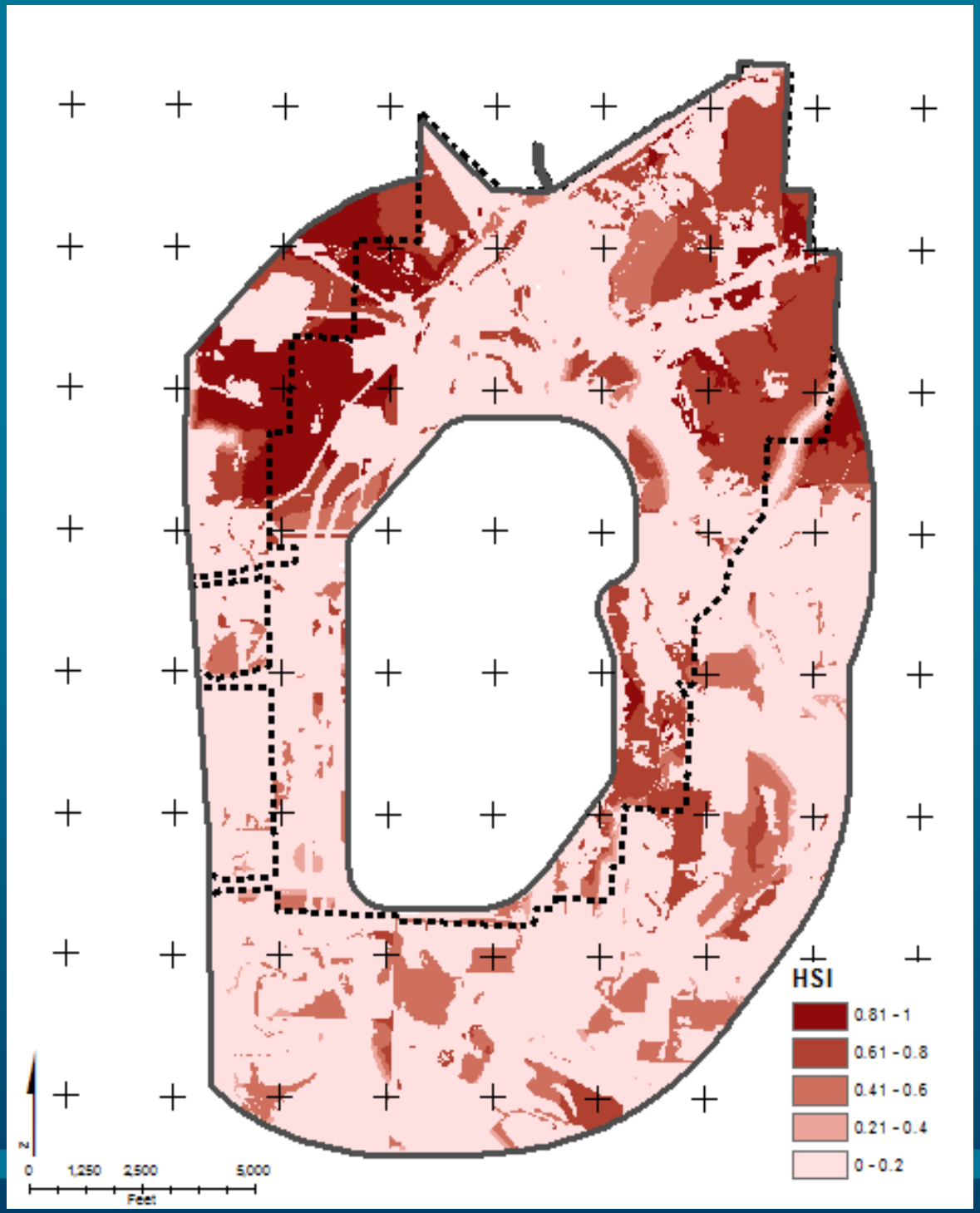

HSI Analysis: Timber Rattlesnake *Crotalus horridus*

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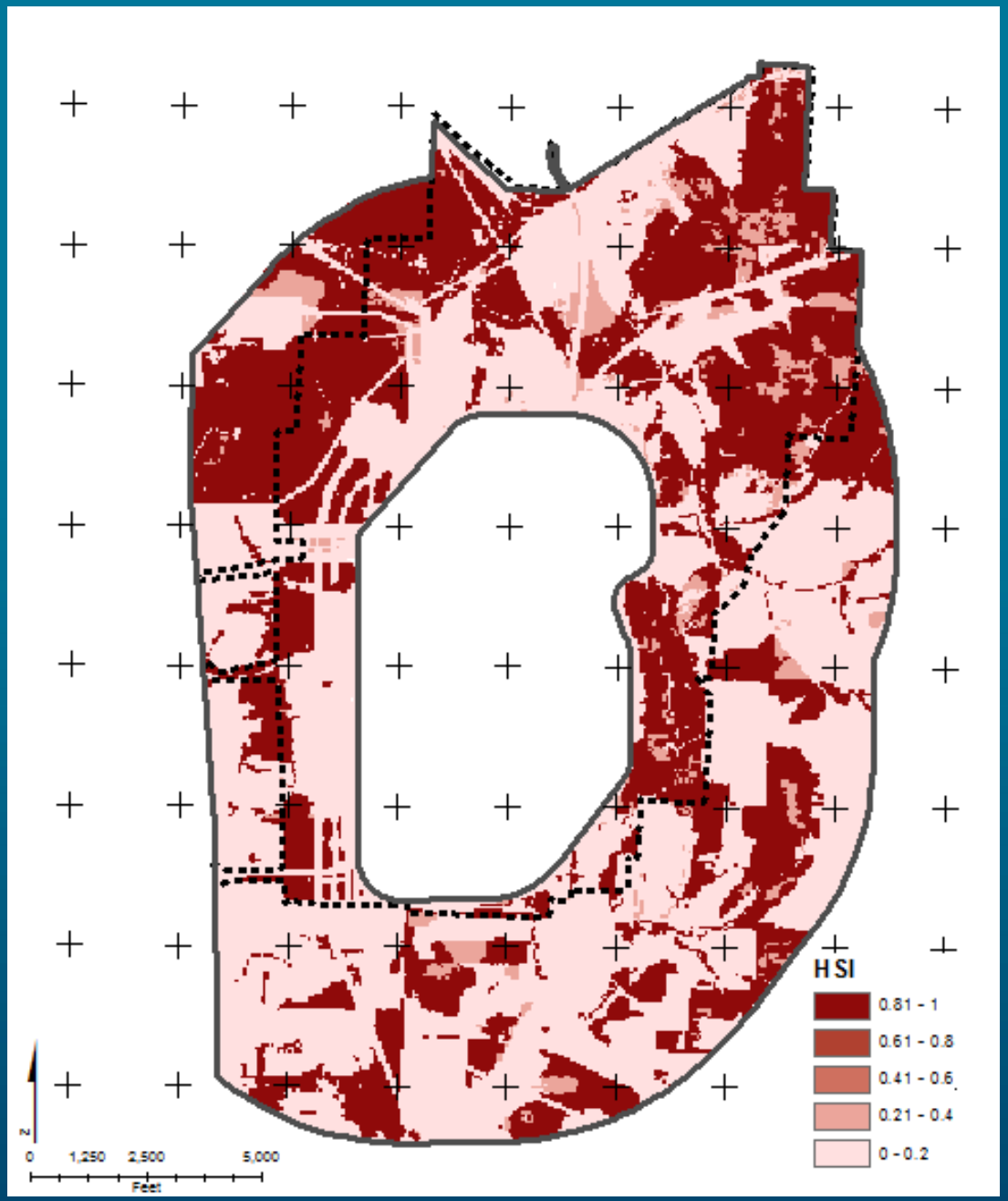

HSI Analysis: Wood Thrush *Hylocichla mustelina*

Brian E. Small

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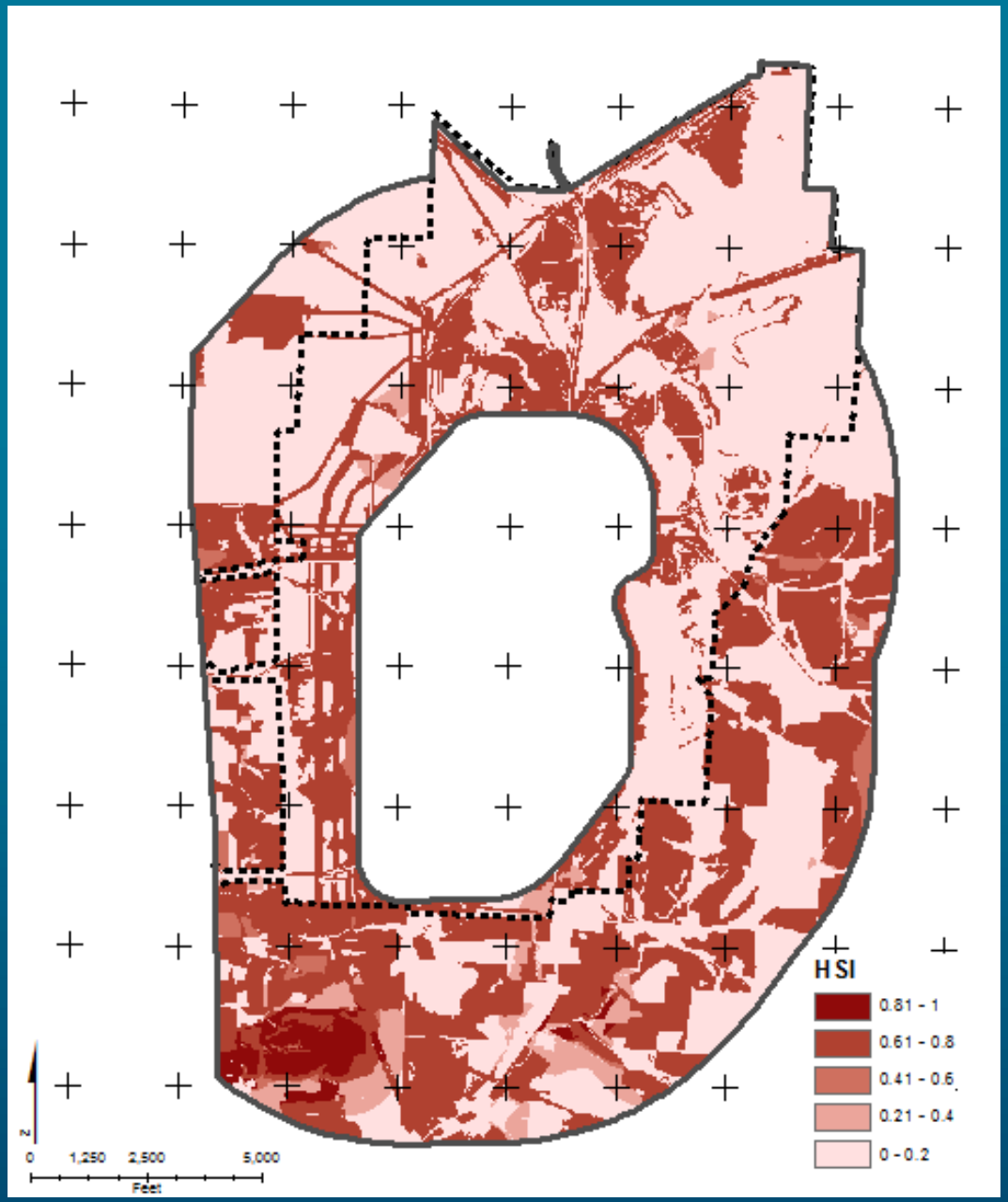
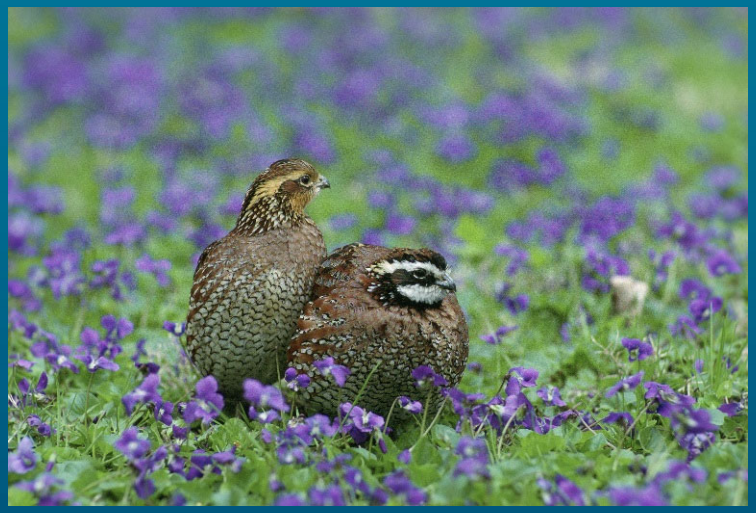


HSI Analysis: Northern Bobwhite *Colinus virginianus*



Steve Maslowski/USFWS

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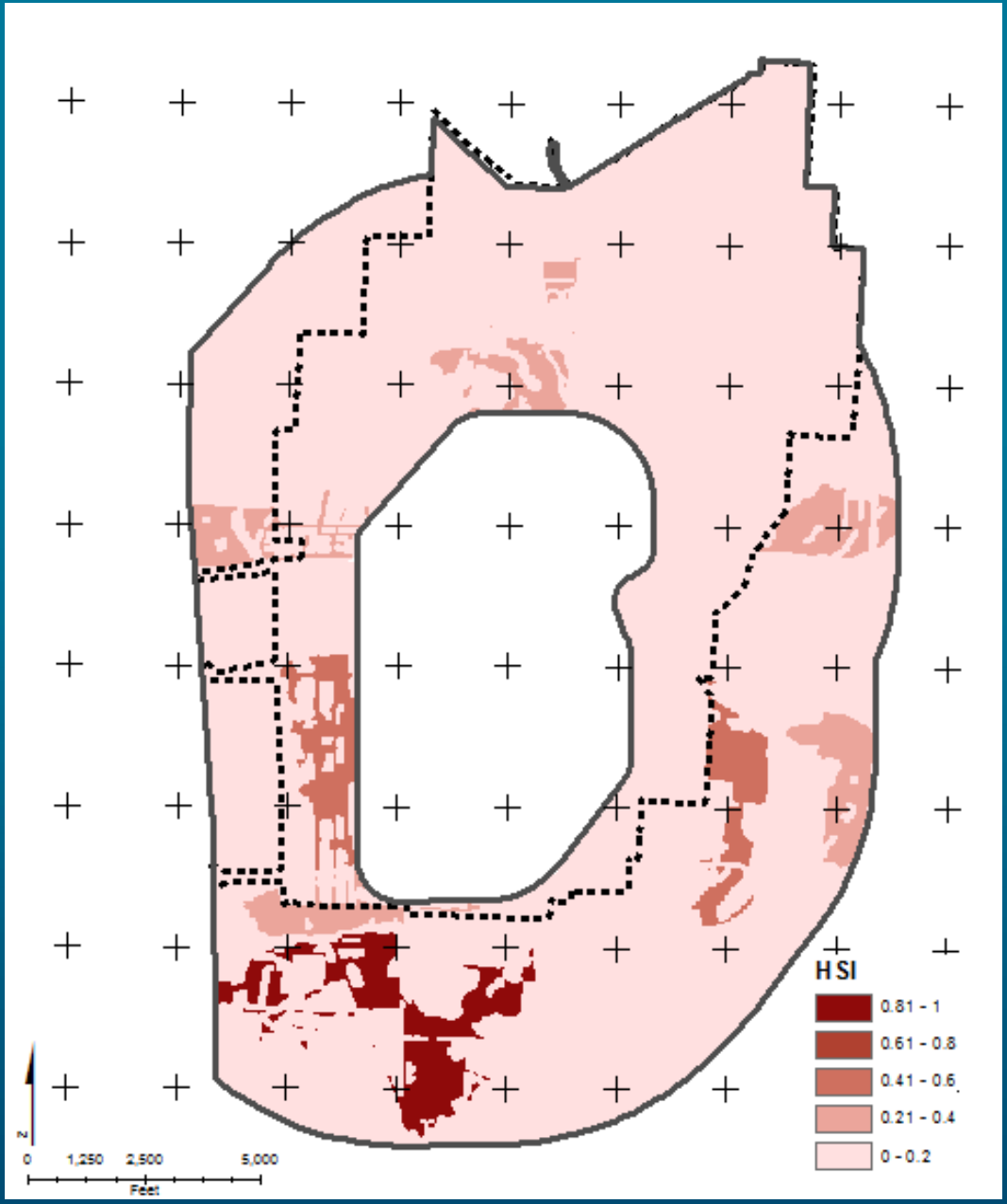

HSI Analysis: Henslow's Sparrow *Ammodramus henslowii*

© R. & N. Bowers/VIREO

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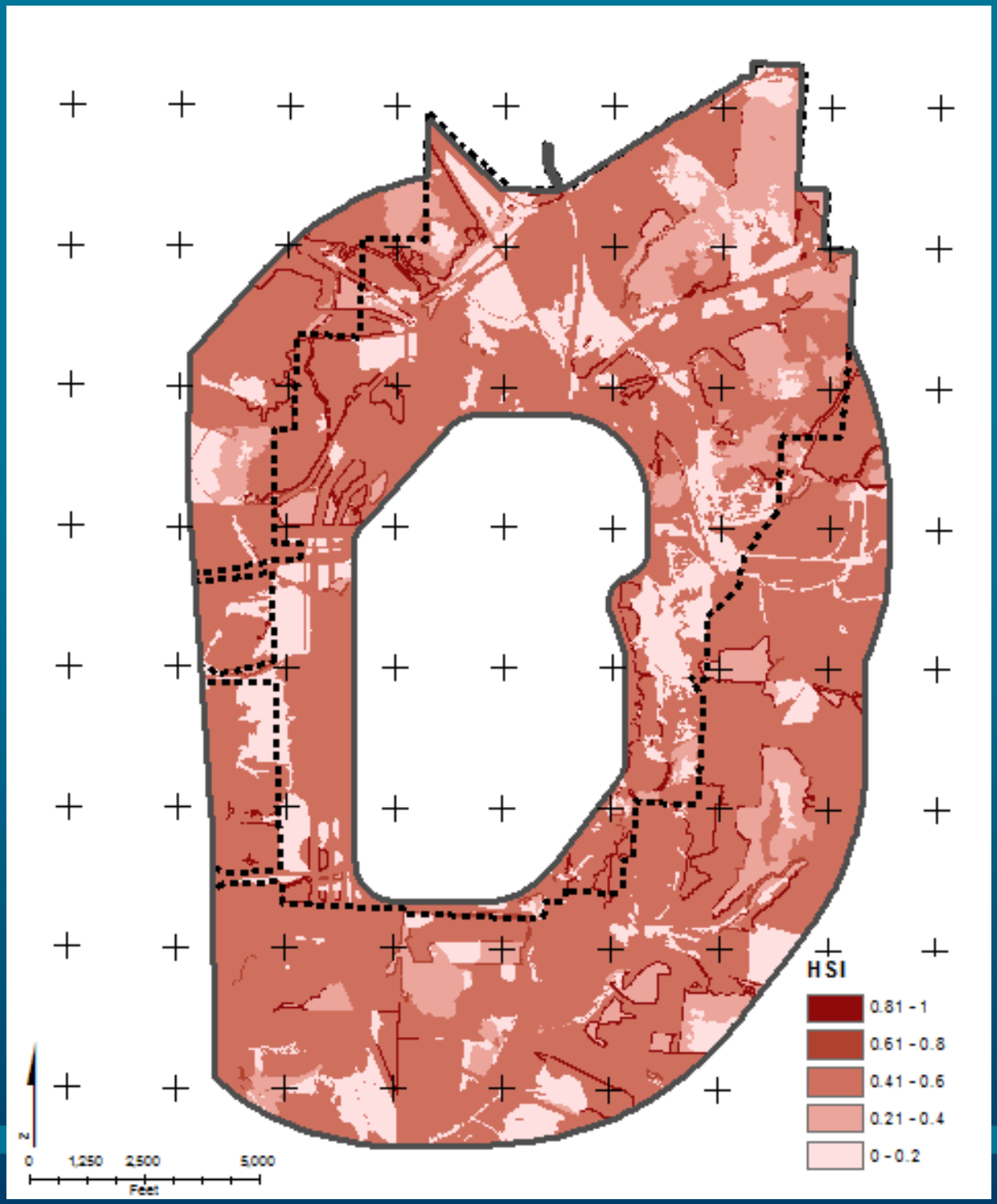
Ross
Pike
Jackson
Scioto



HSI Analysis: Indiana Bat *Myotis sodalis*

Adam Mann, Environmental Solutions and Innovations

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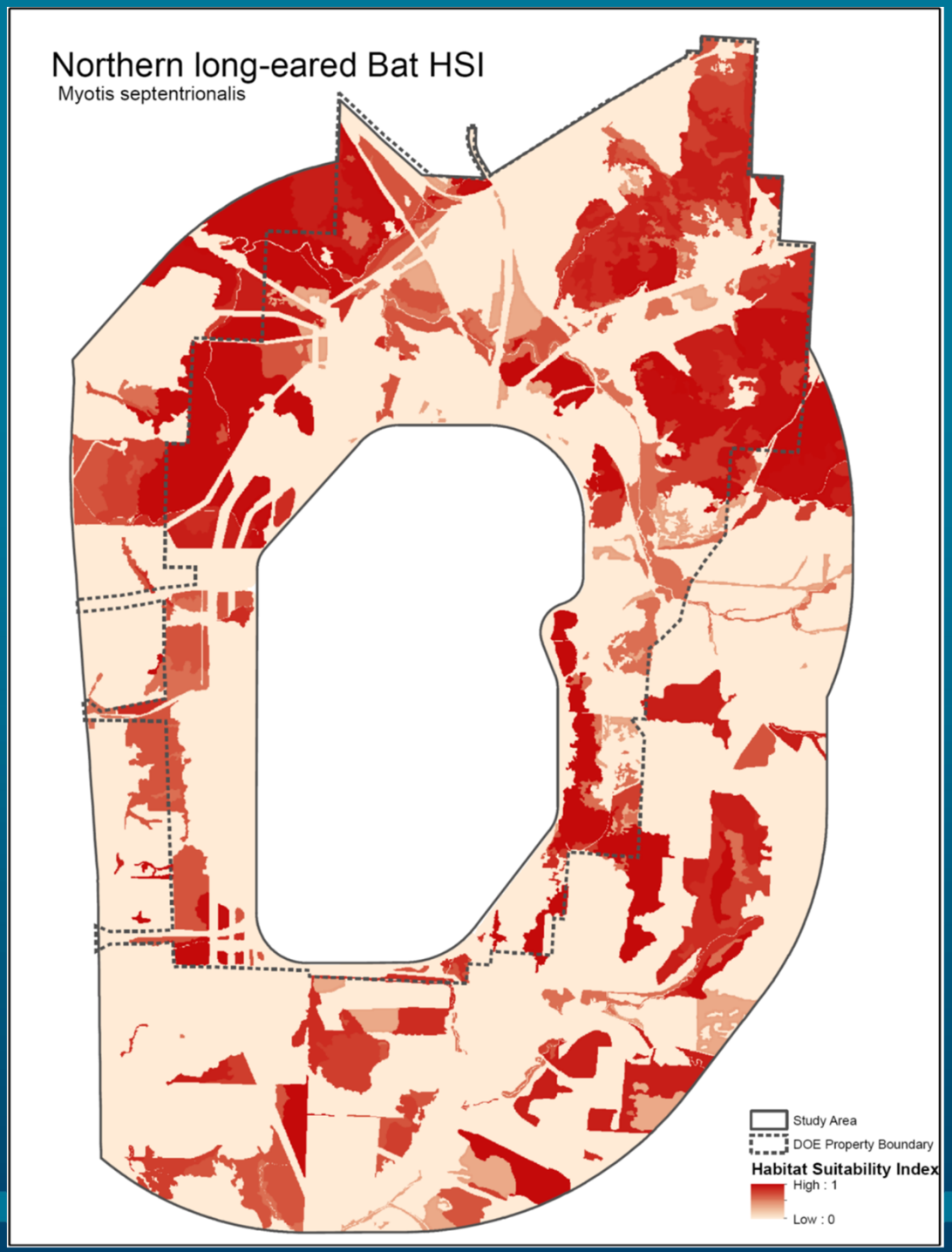

HSI Analysis: Northern Long-eared Bat *Myotis septentrionalis*

Photo © Dave Redell

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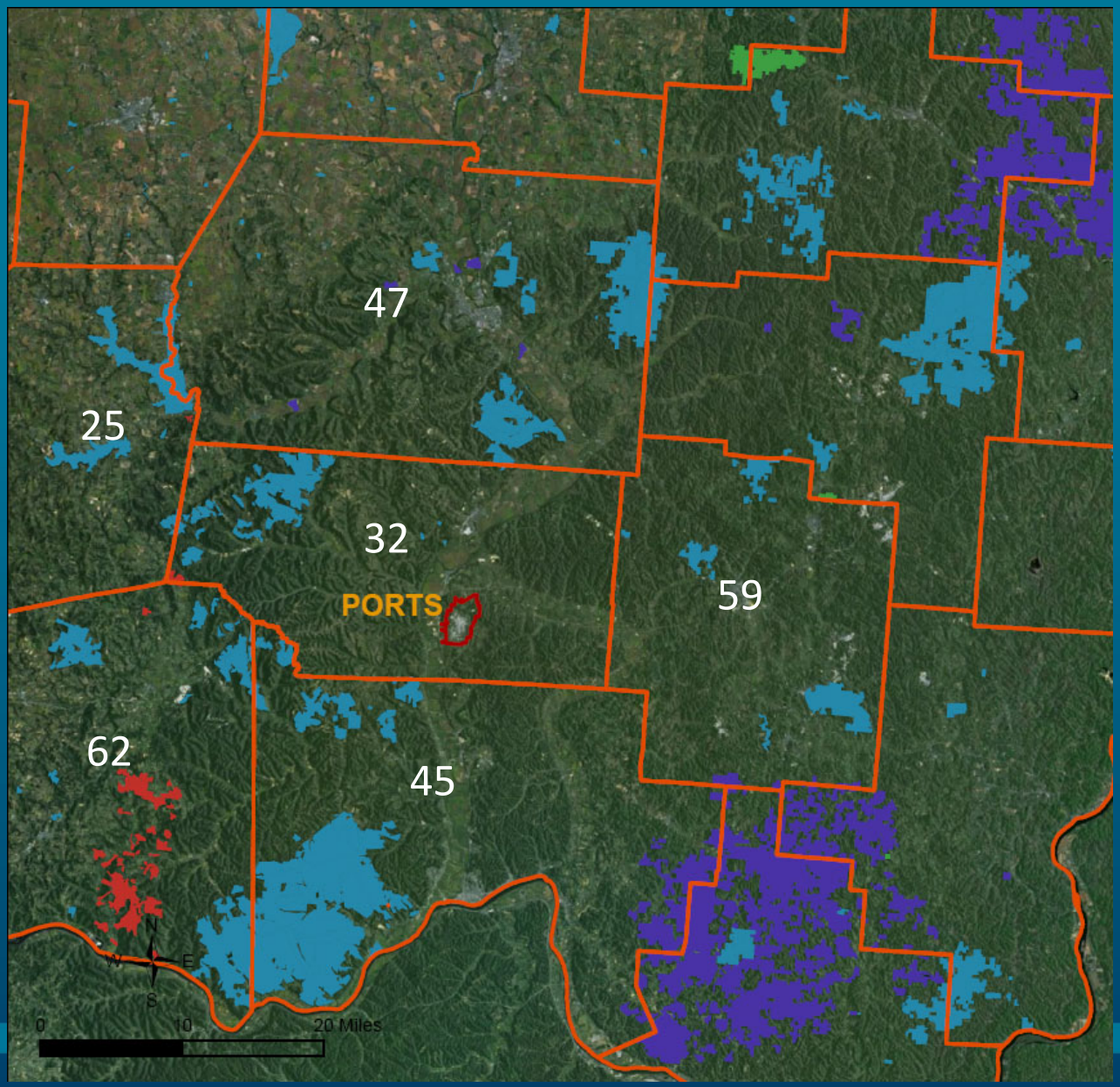
Regional Conservation Efforts



- PORTS habitat quality is variable due to the landscape legacy.
- While much of the site is heavily disturbed, portions exhibit high-quality habitat or the potential to become so through conservation efforts.

* ODNR: 32 listed plants species found in Pike County (2010-11)

* US FWS: List 117 floral and faunal species as Conservation Priorities in the Ohio River Valley Region (2002)

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Evaluation of habitats affected by potential OSDC Plan in Study Area D

Habitat Feature	Acres
Oak-Hickory Forest	68.38
Mixed Mesic Forest	51.22
Native Pine Forest	34.35
Mowed Grass/Lawn	32.71
Ruderal Successional	18.55
Successional Scrub	16.24
Successional Forest	15.07
Oldfield - Successional	8.61
Bottomland Hardwood Forest	6.86
Ruderal-Scrub	2.24
Secondary Roads	1.60
Buildings/Facility	1.57
Ruderal Shrub-Sapling	1.23
Palustrine Shrub-Scrub Wetland	0.59
Paved Areas/Outdoor Storage	0.55
Primary Roads: Pavement Asphalt	0.47
Natural Streams	0.36
Water Conveyance/Control	0.16
Palustrine Emergent Wetland	0.03

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Conservation Management Planning??

- **Defining Conservation…**from the dictionary
  - 1. the act of conserving.
  - 2. official supervision of rivers, forests, and other natural resources in order to preserve and protect them through prudent management.
  - 3. the careful utilization of a natural resource in order to prevent injury, decay, waste, loss, or depletion.
  - 4. the restoration and preservation of works of art.

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  - 4. the restoration and preservation of works of art.

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Classic Conservation…

- Gifford Pinchot defined it as an *ethic of use* – a land ethic in which humans and nature could co-exist. This ethic relies heavily on **scientific understanding** of the connection between humans and nature.
- The **mission of the US Forest Service** is to: "achieve quality land management under the sustainable multiple-use management concept to meet the diverse needs of people."

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7 out of 9 Future-Use Scenarios chosen by public survey recommend incorporation of:

Green Space

- Therefore…
  - In order to achieve quality land management that meets the diverse needs of the PORTS site:
  - *Planning should include the principles of conservation management to maximize the potential benefits of all natural assets to achieve the greatest success for the ultimate future-use of PORTS*

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Quantifiable Benefits of Conservation Management Planning

- Air quality improvements (USEPA)
  - Capture and mitigation by vegetation
- Improvement of water quality management
  - Stormwater runoff (USEPA)
  - Pollutant filtration (USACE)
- Affords recreational and public use opportunities
  - To Improve health and wellness
  - Elevates site profile and visibility
- Promotes Wildlife Habitat
- Maintains greatest potential for ecological services

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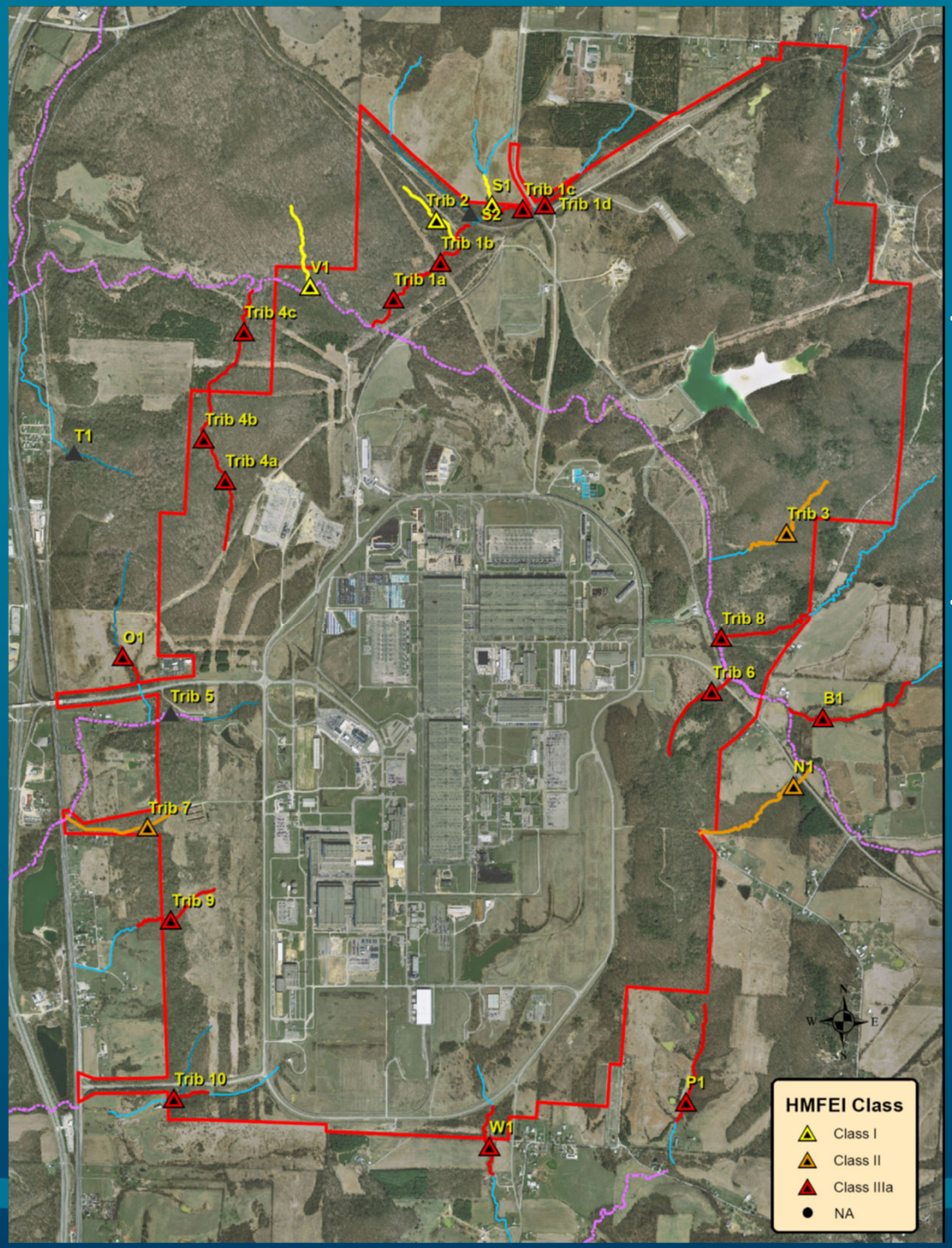

Evaluation of Headwater Streams

- To assess the quality of HW streams on- and off-site
- To assess mitigation opportunities due to impacts to other HW streams from D&D activities

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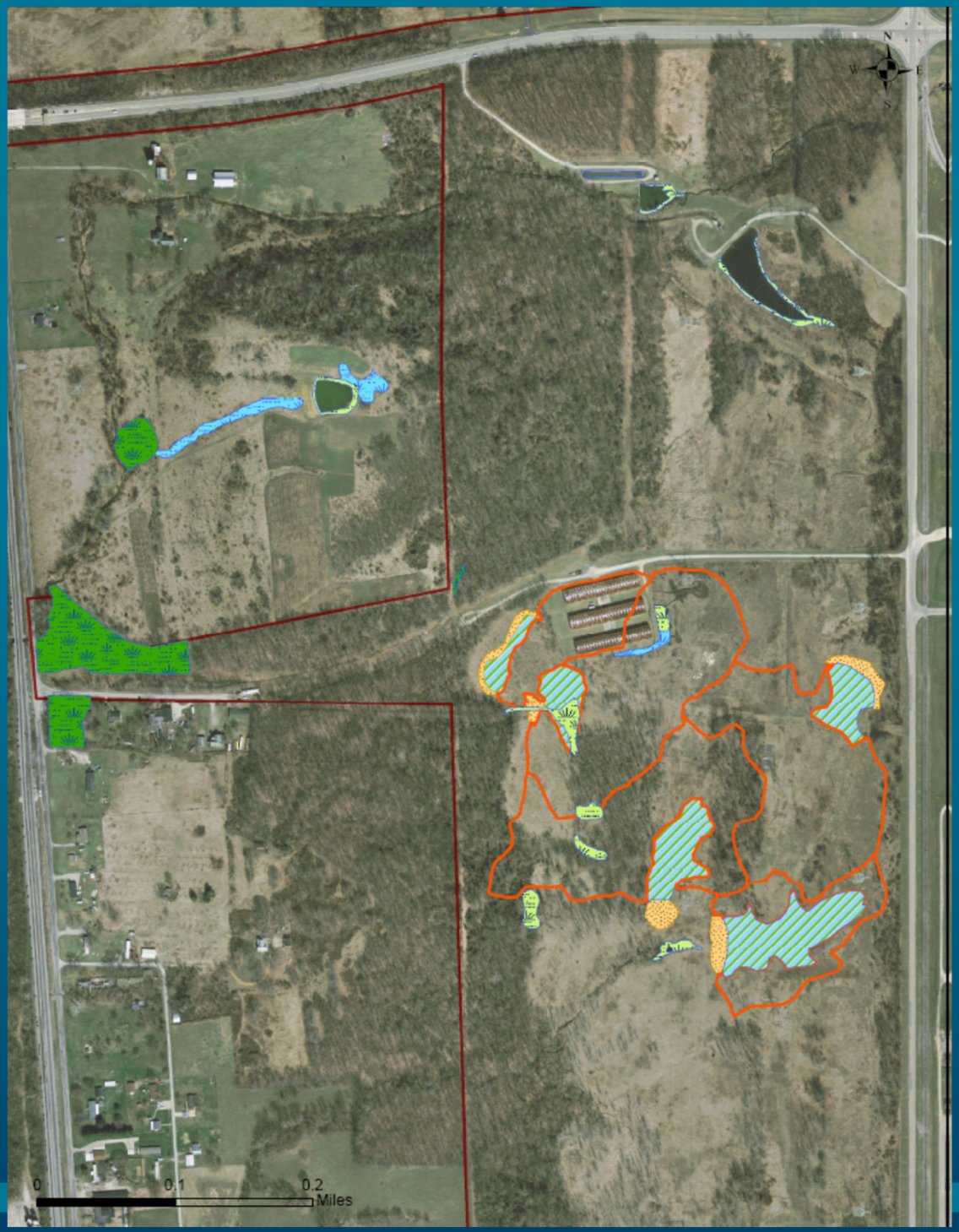

Evaluation of Wetland Mitigation Options

- To identify opportunities to preserve, improve, and/or create wetlands on-site
- To assess mitigation opportunities due to impacts to other HW streams from D&D activities

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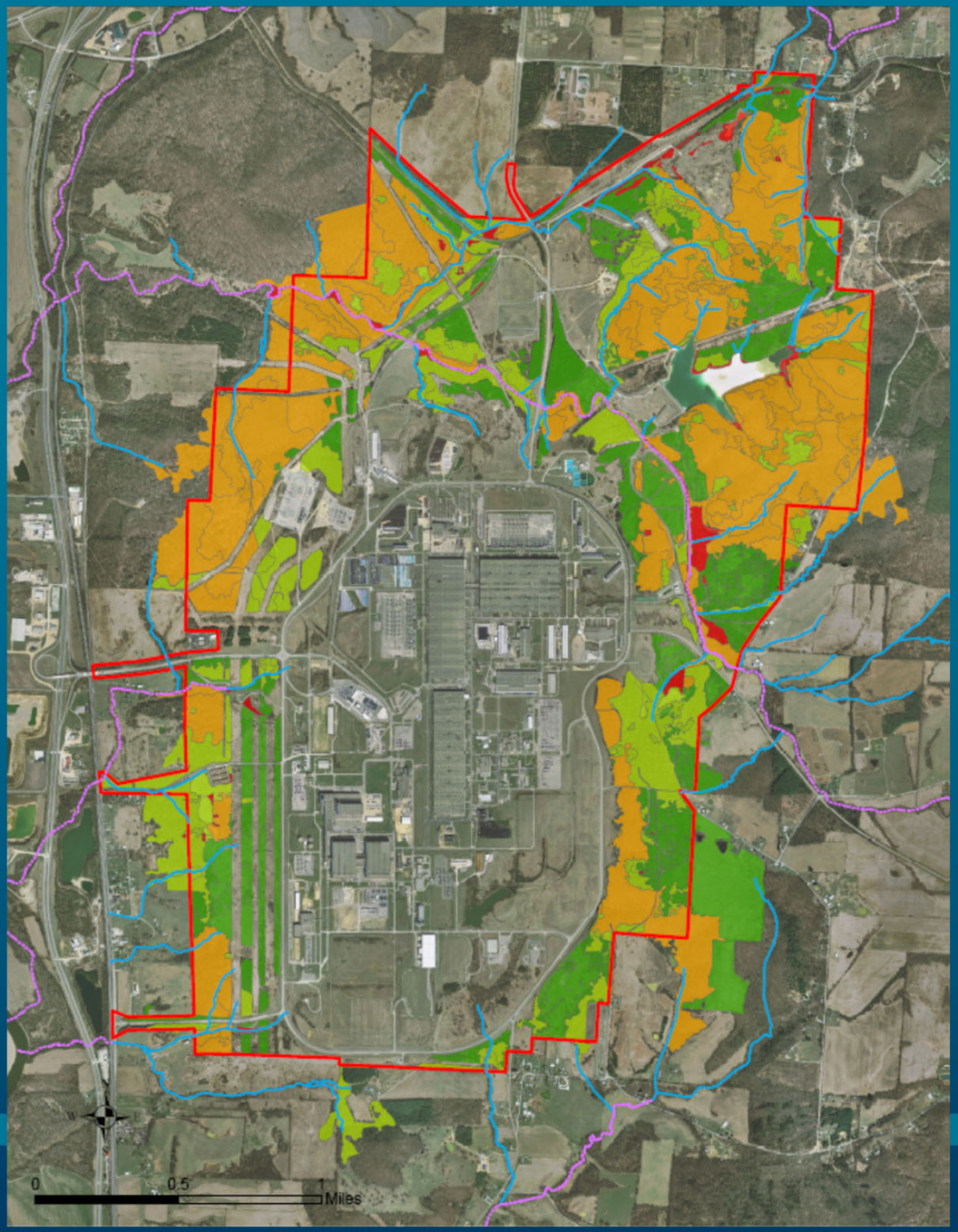
Managing the Eco-Assets Collectively



Prioritizing areas:

- To conserve eco-assets
- To maximize the potential benefit
- To identify high and low conservation areas for development and conservation planning

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Potential Use of Green Space

Abundant forest canopy

Opportunities to interact with ecological/historical features

Multiple points of access

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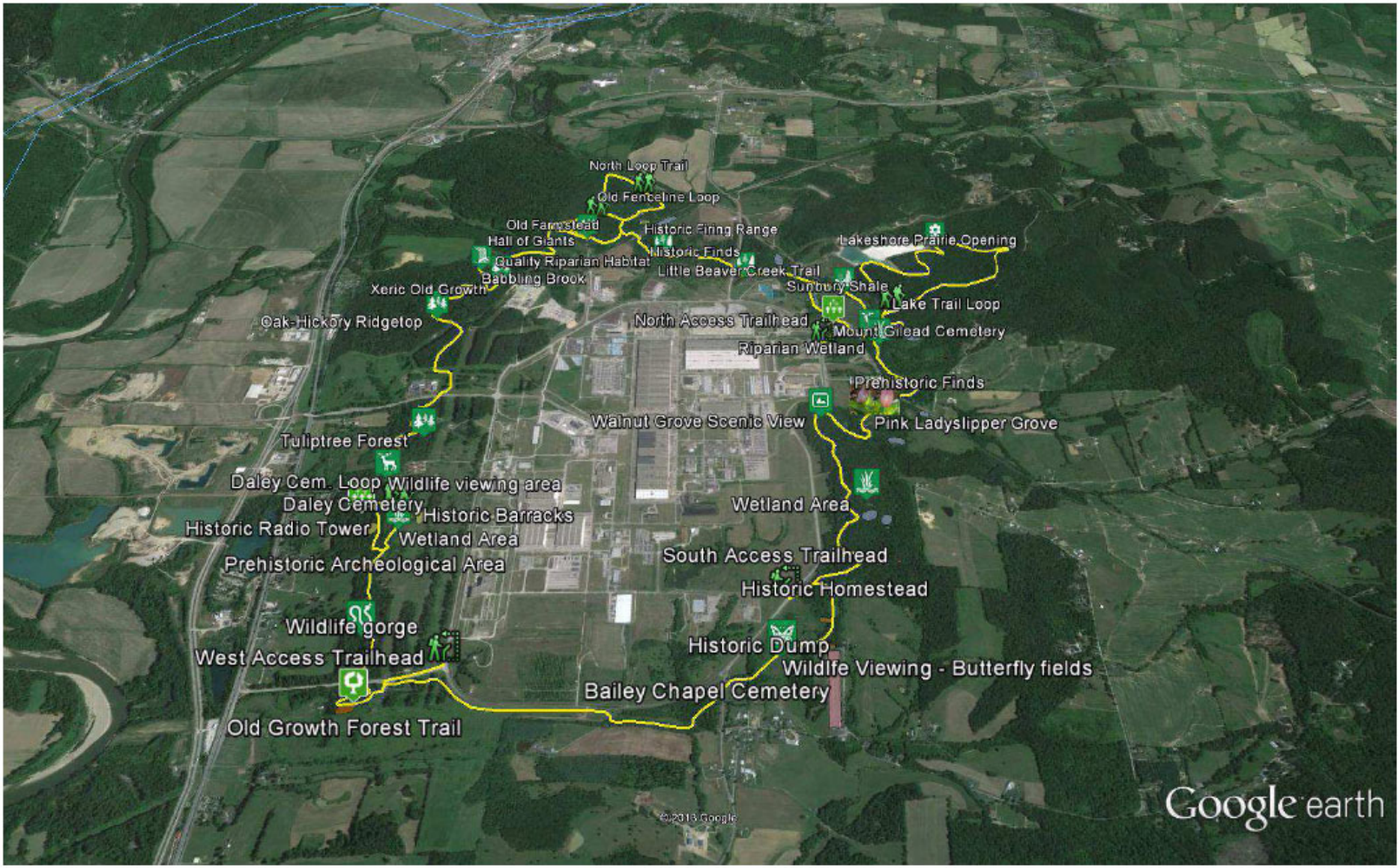
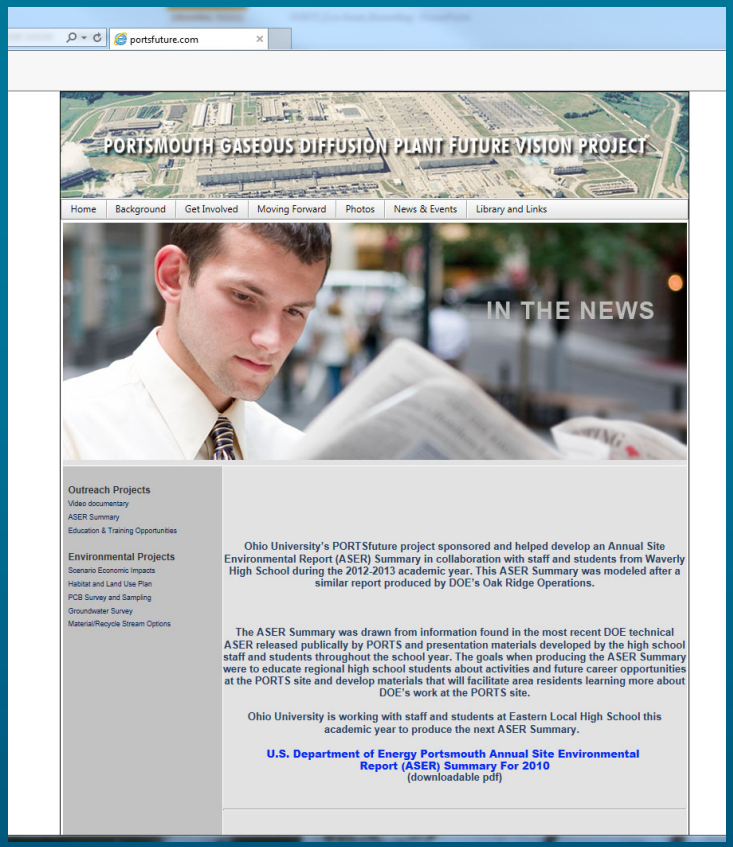


Google earth

miles 1
km 2

www.PORTSFUTURE.com



Look for:

- Published Reports and maps
- PORTS site history and pictures
- Coming soon… Video documentaries for a virtual symposium presented by our staff

PORTS FUTURE

Questions?

Contact information:

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Voinovich School of Leadership and Public Affairs,

Ohio University

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