Site Characterization, Habitat and Land Use Mapping and Data/Wildlife Management Plan - Summary of Year 1 Field Work and Data Collection

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Bob Eichenberg, Senior Project Manager, Voinovich School of Leadership and Public Affairs

PORTS FUTURE

Ross

Pike

Jackson

Scioto

Background

- DOE grant to Voinovich School of Leadership and Public Affairs-Purpose and Scope
  - Habitat Task in relation to D&D and possible future uses of the PORTS site
  - Deliverables
    - Draft georeferenced database and landuse map available for review – August 1, 2012
    - Final georeferenced database and landuse map complete – September 30, 2012
    - Data Gap Report complete – September 30, 2012 (no DOE review of this one needed)
    - Draft Wildlife Management Plan (including summary of public comment/involvement) available for review – September 30, 2012
    - Final Wildlife Management Plan (including summary of public comment/involvement) complete – November 15, 2012

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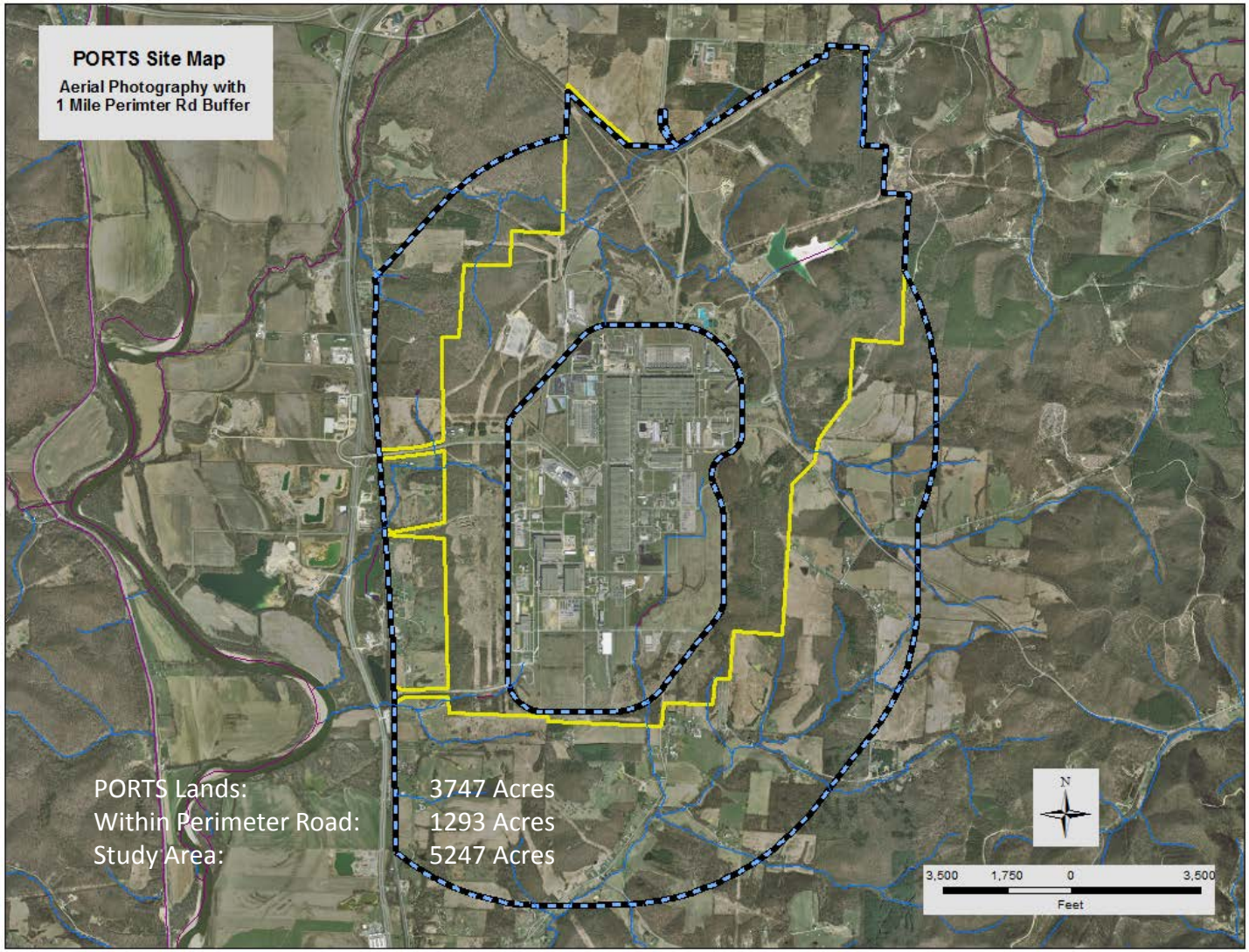
Habitat and Land Use Study Area



PORTS FUTURE

Pike Jackson Scioto

Overview

- Project Rationale and Objectives
- Methods and Processes
- Habitat Delineation Progress
- First Season Fieldwork
- Some Preliminary Observations
- Next Steps to Project Completion

PORTS FUTURE

Project Rationale and Objectives

- Develop Land Use Data to Inform DOE and Assist with Planning for Potential Future Uses of the Site

- Prepare a Detailed, GIS-based Habitat Map and Database for Use in Land and Wildlife Management Planning

Methods and Processes

- Habitat Delineation Concepts
- Supporting Data
- Field Data
- Data Integration: the Delineation

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Habitat Delineation Concepts

- What is Habitat
- Climatic Climax Vegetation
- Water Budget
- Substrate Materials
- Time Since Disturbance

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Supporting Data

- Aerial Imagery
- Soils Mapping
- LiDAR Products: Topography, Aspect, Drainage, Canopy Height
- Slope
- Anthropogenic Features: Roads, Prior Disturbances, Paved area, Buildings

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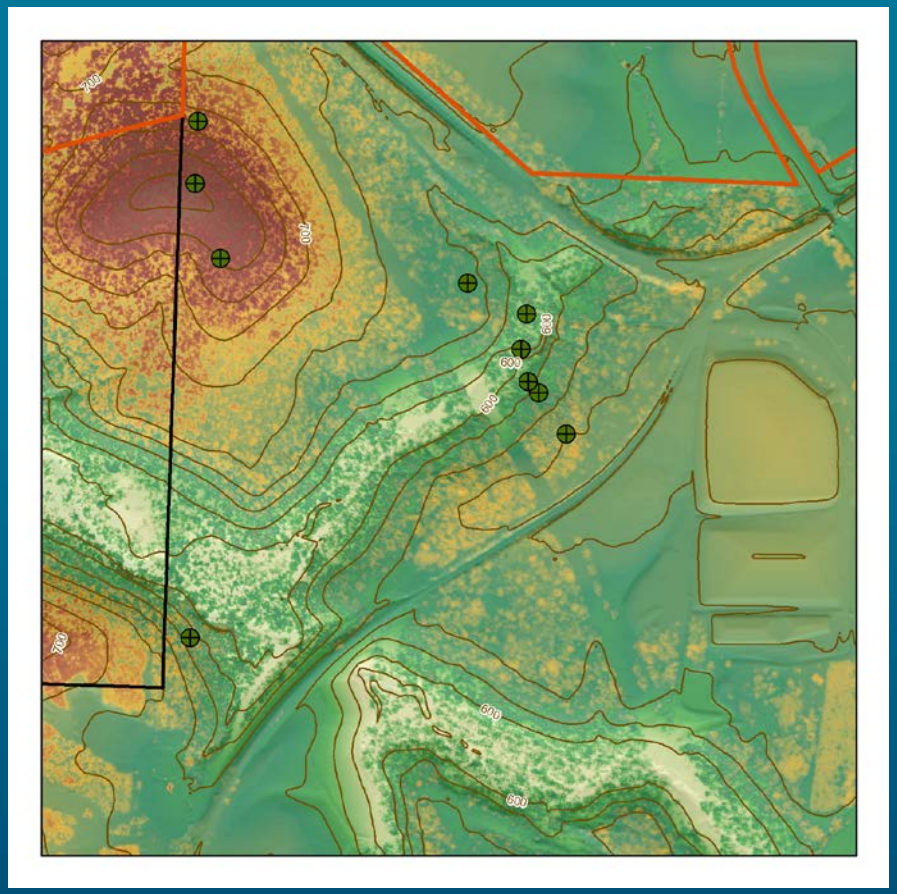
GIS: Aerial Image

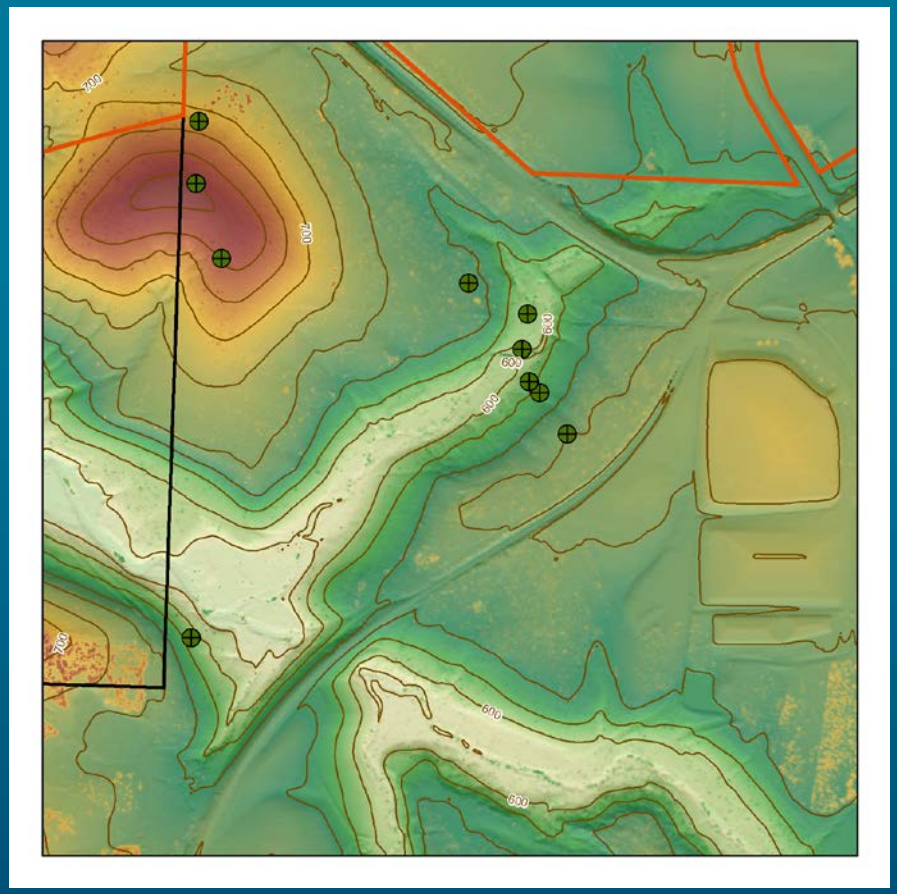
PORTS FUTURE

Surface Analysis : LiDAR* Returns

First Returns



Last Returns



*Light Detection And Ranging

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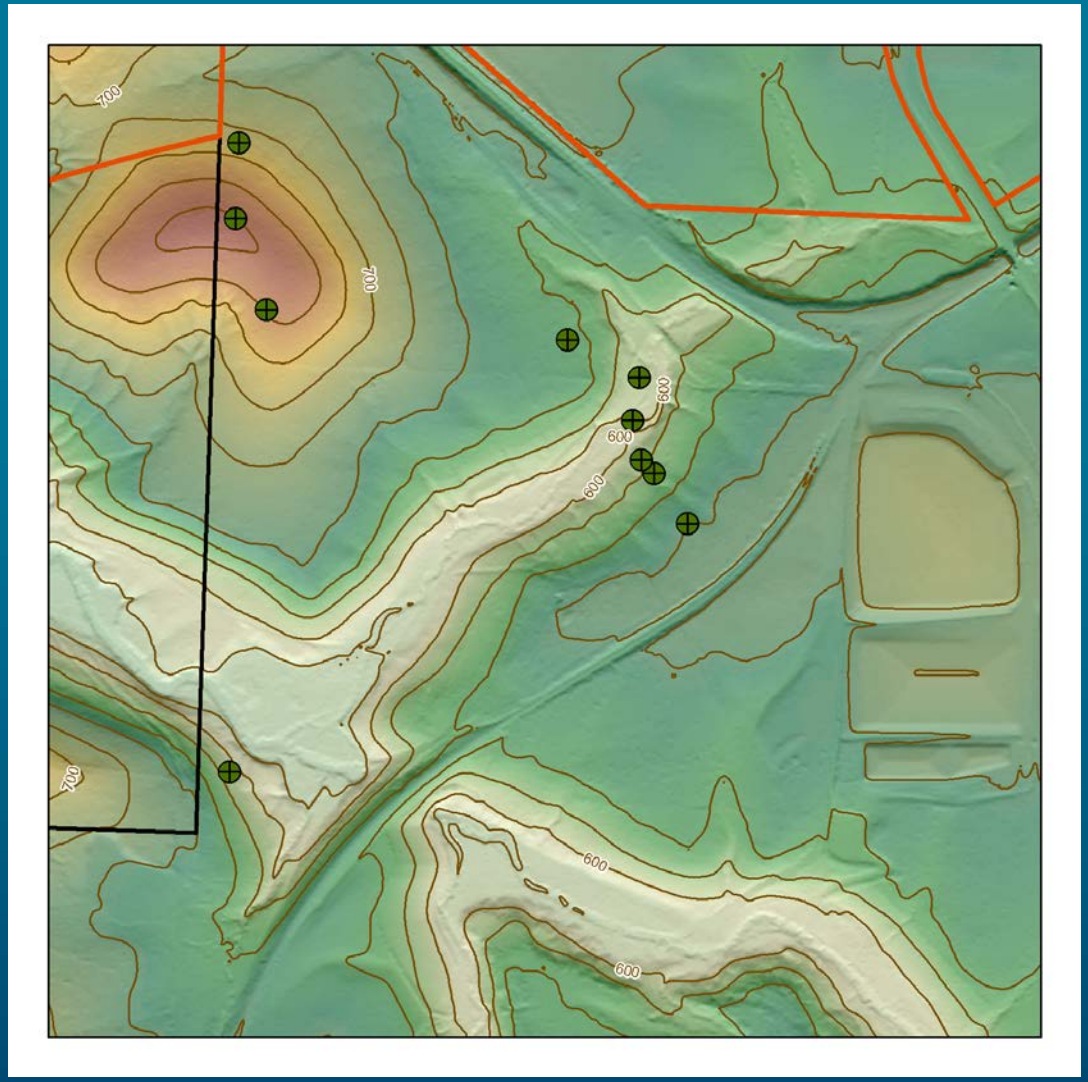
Surface Analysis : Digital Elevation Model



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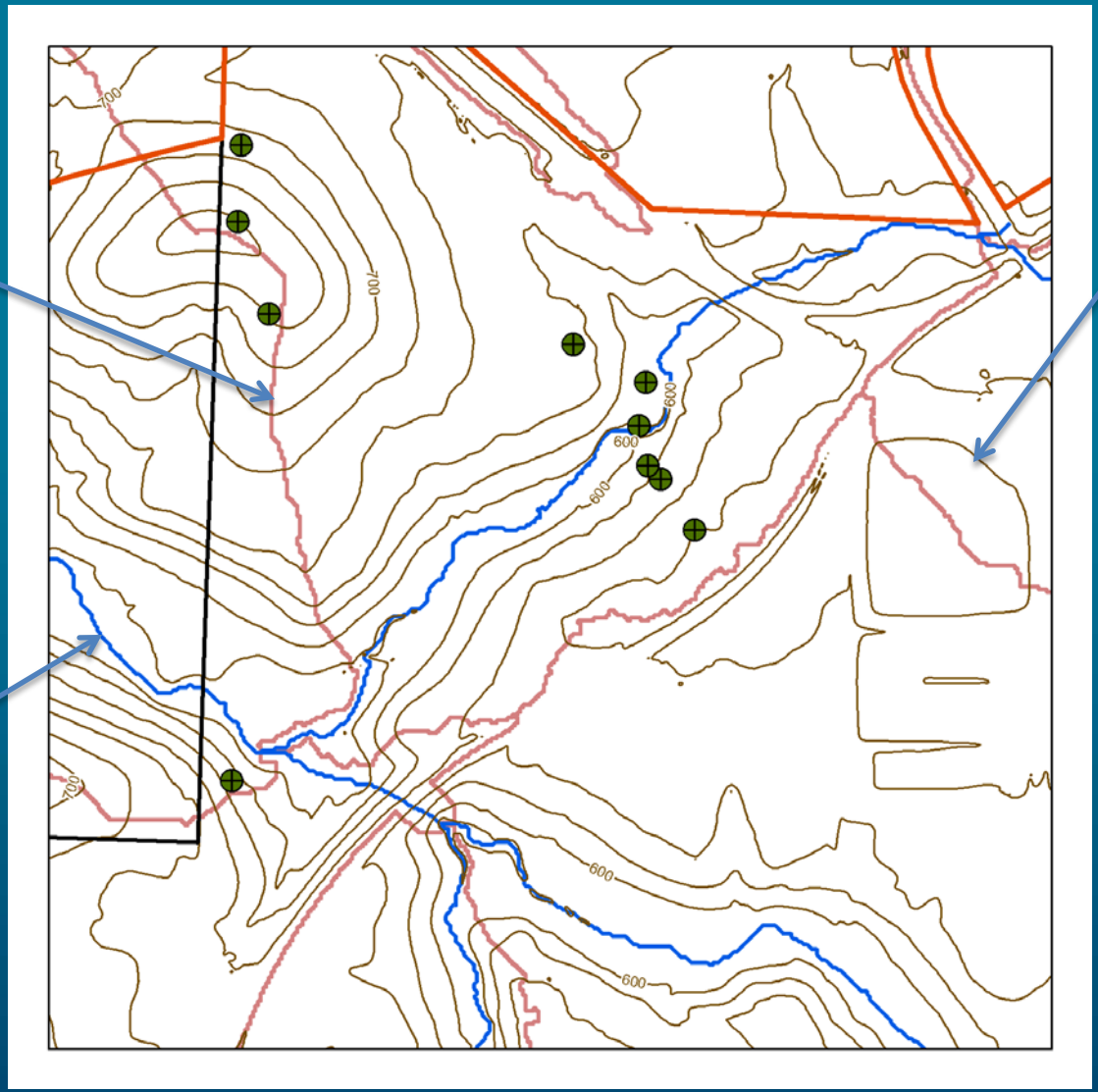
Surface Analysis : Topography and Drainage

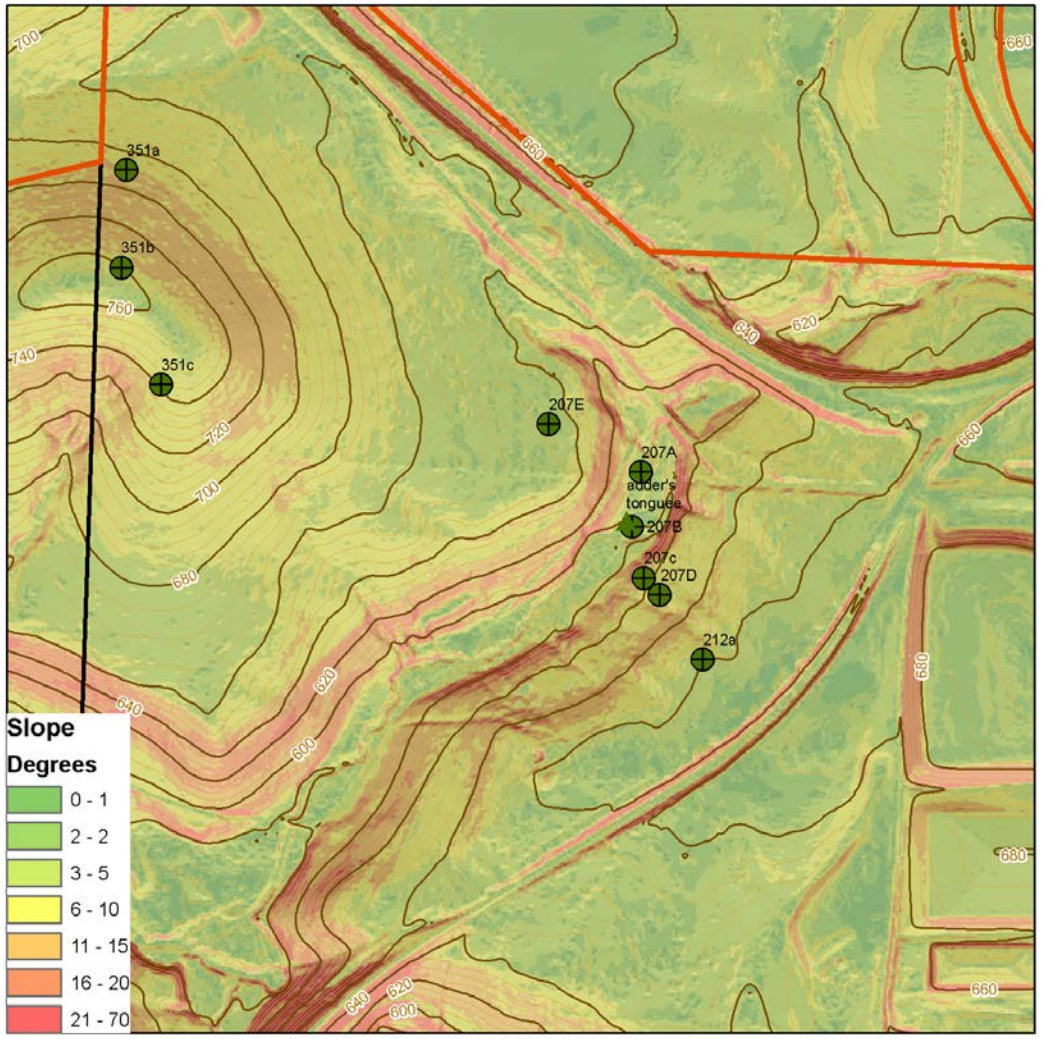
Drainage Basin Boundaries

Stream Channels



Topographic Contour Lines

Surface Analysis : Slope



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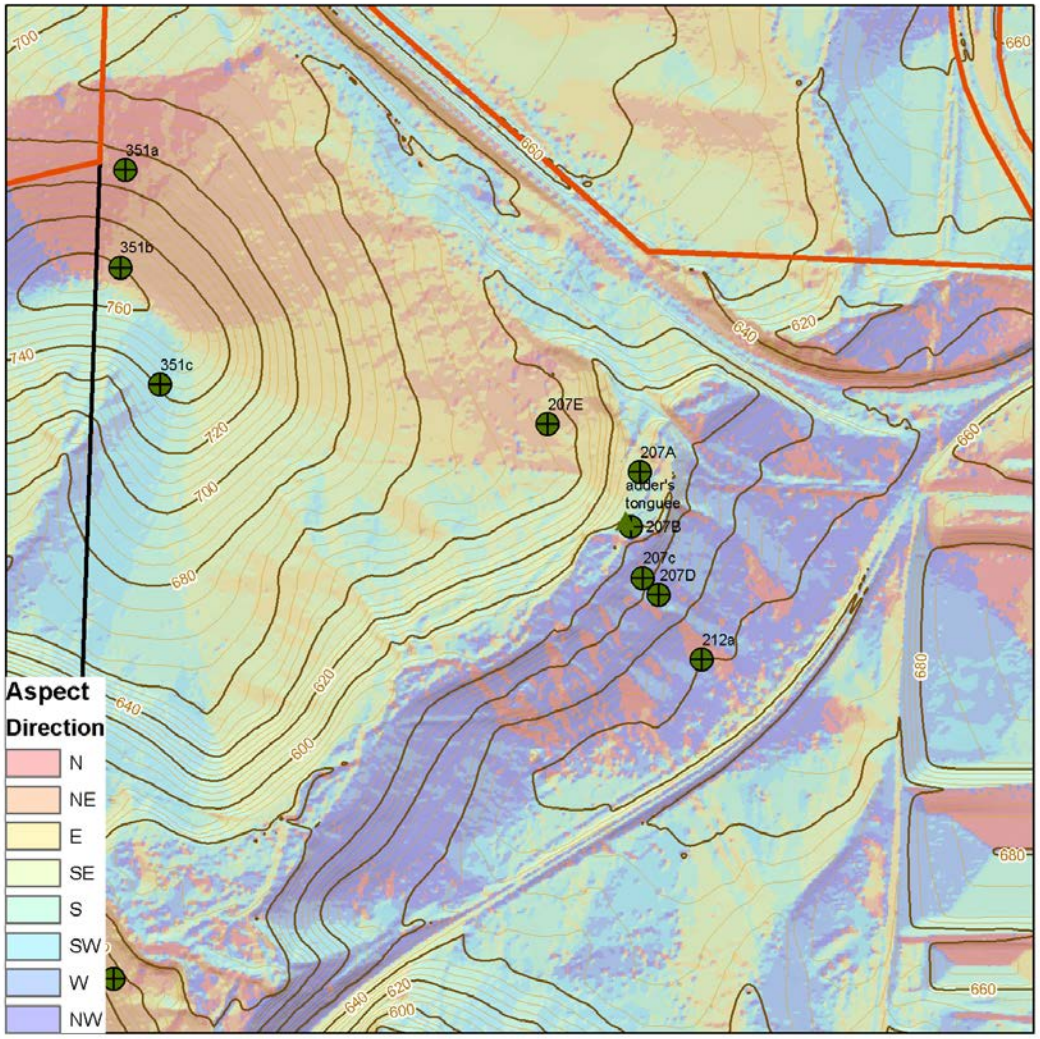
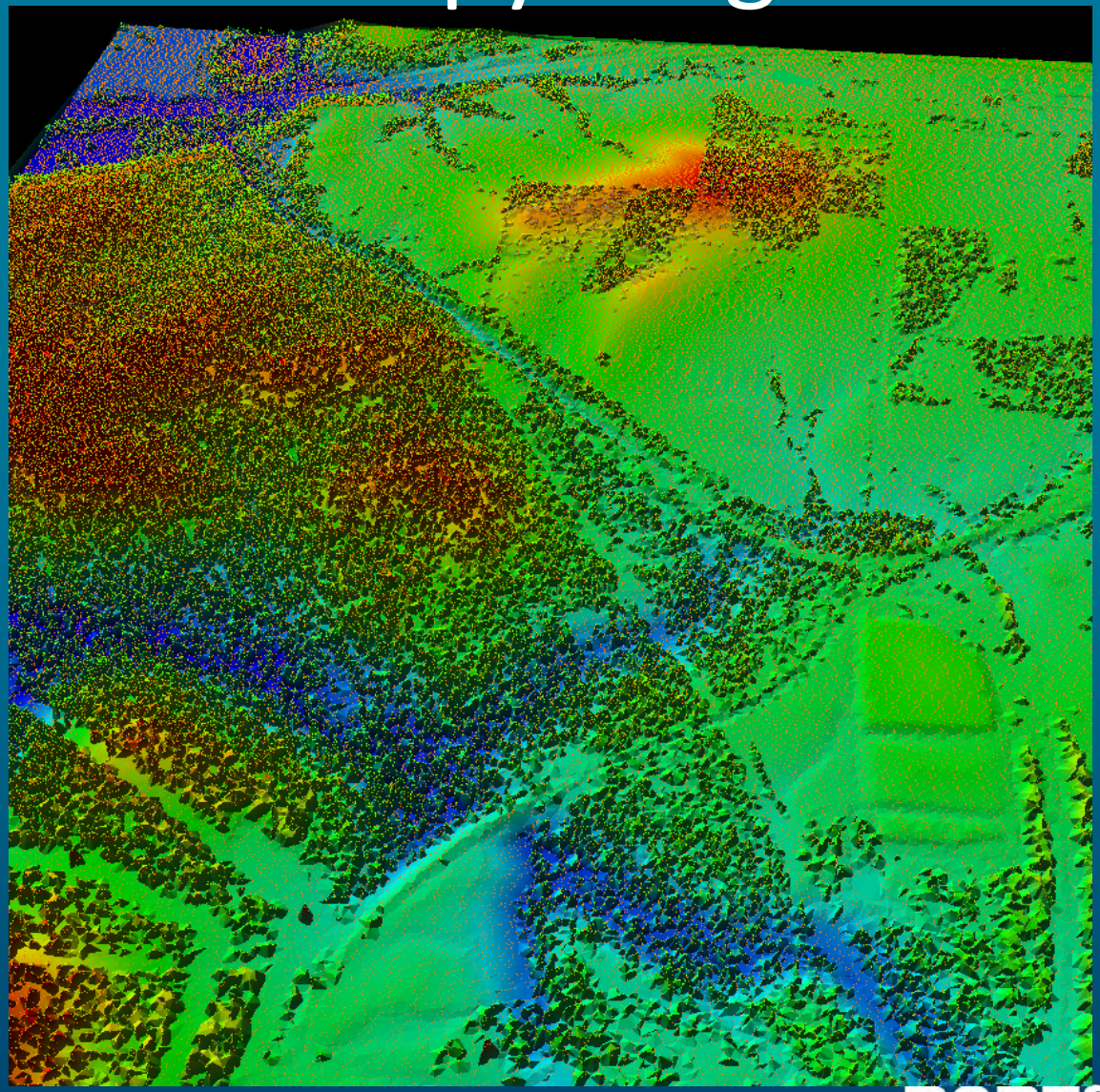
Surface Analysis : Aspect



Tree Canopy Heights



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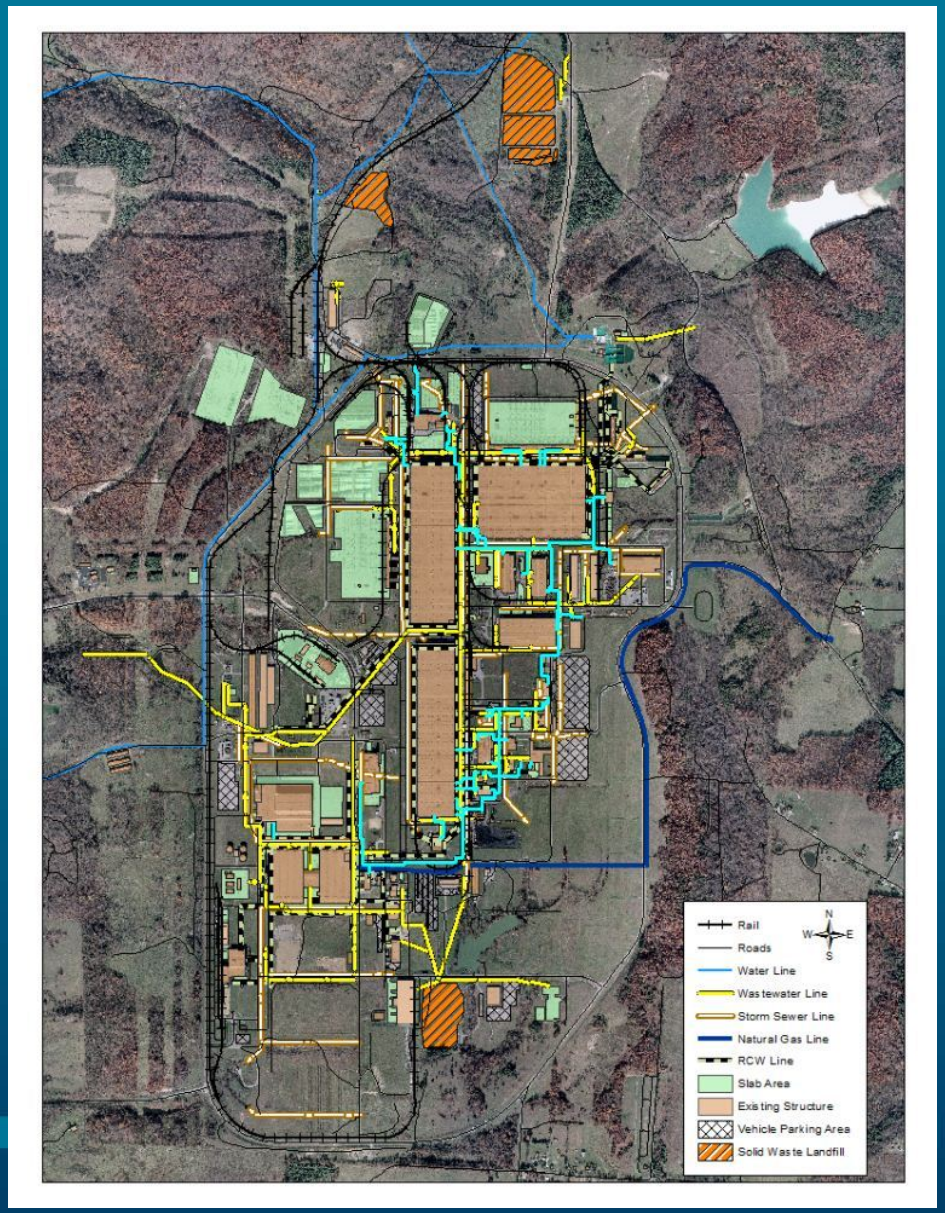
Infrastructure



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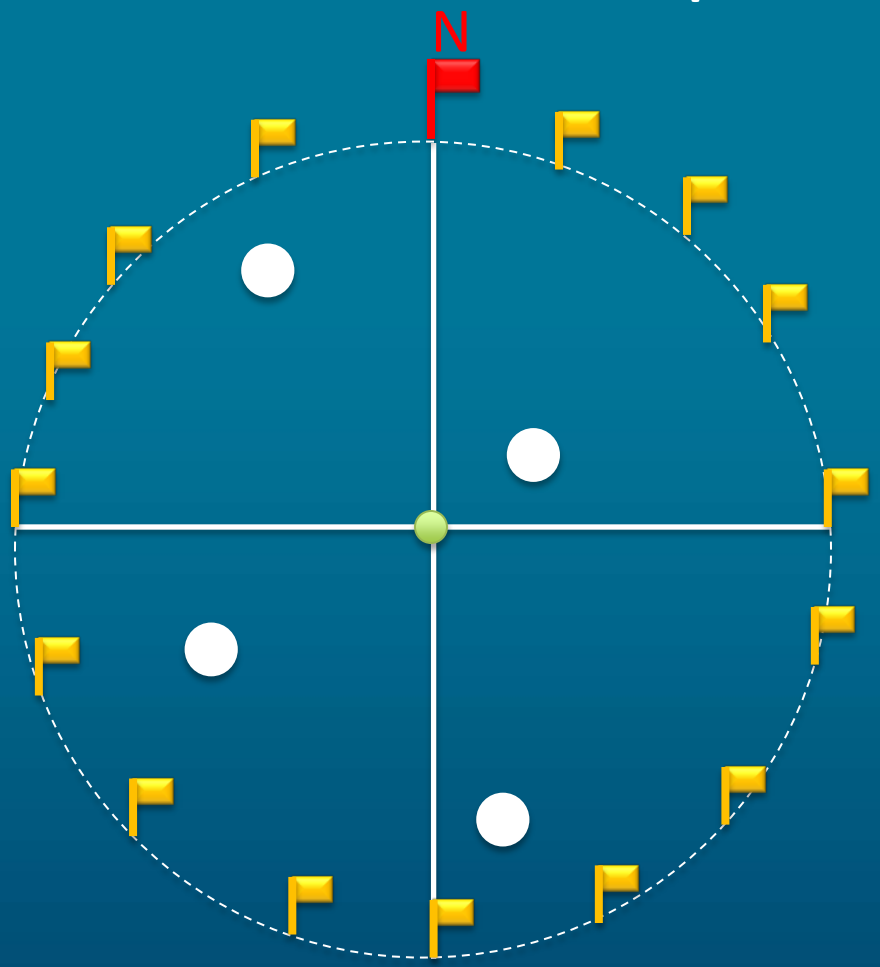
Field DATA COLLECTION METHODS

- Quantitative Sampling

- Rapid QA/QC Sampling

PORTS FUTURE

Field Plot Setup



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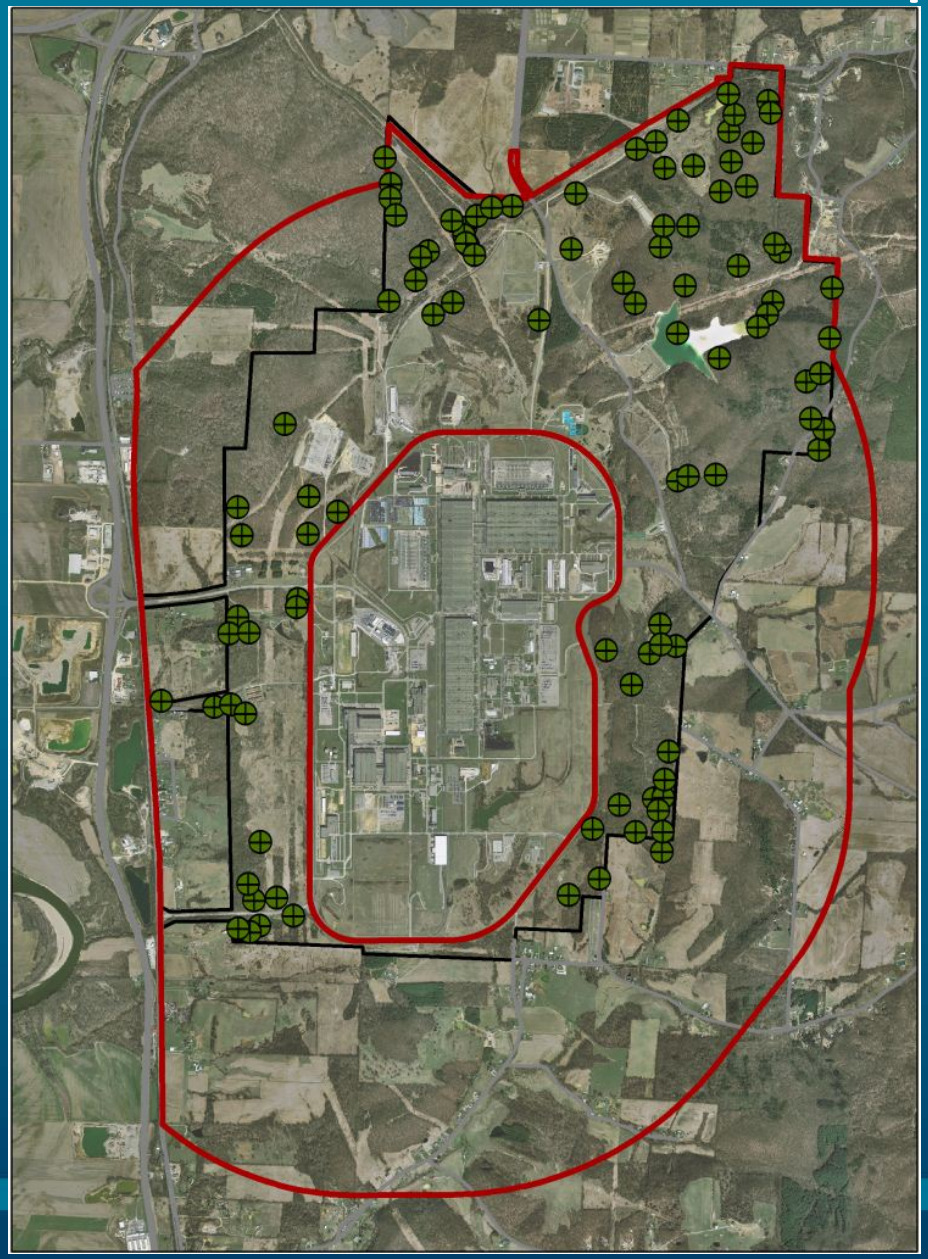
Quantitative Field Sampling Plots



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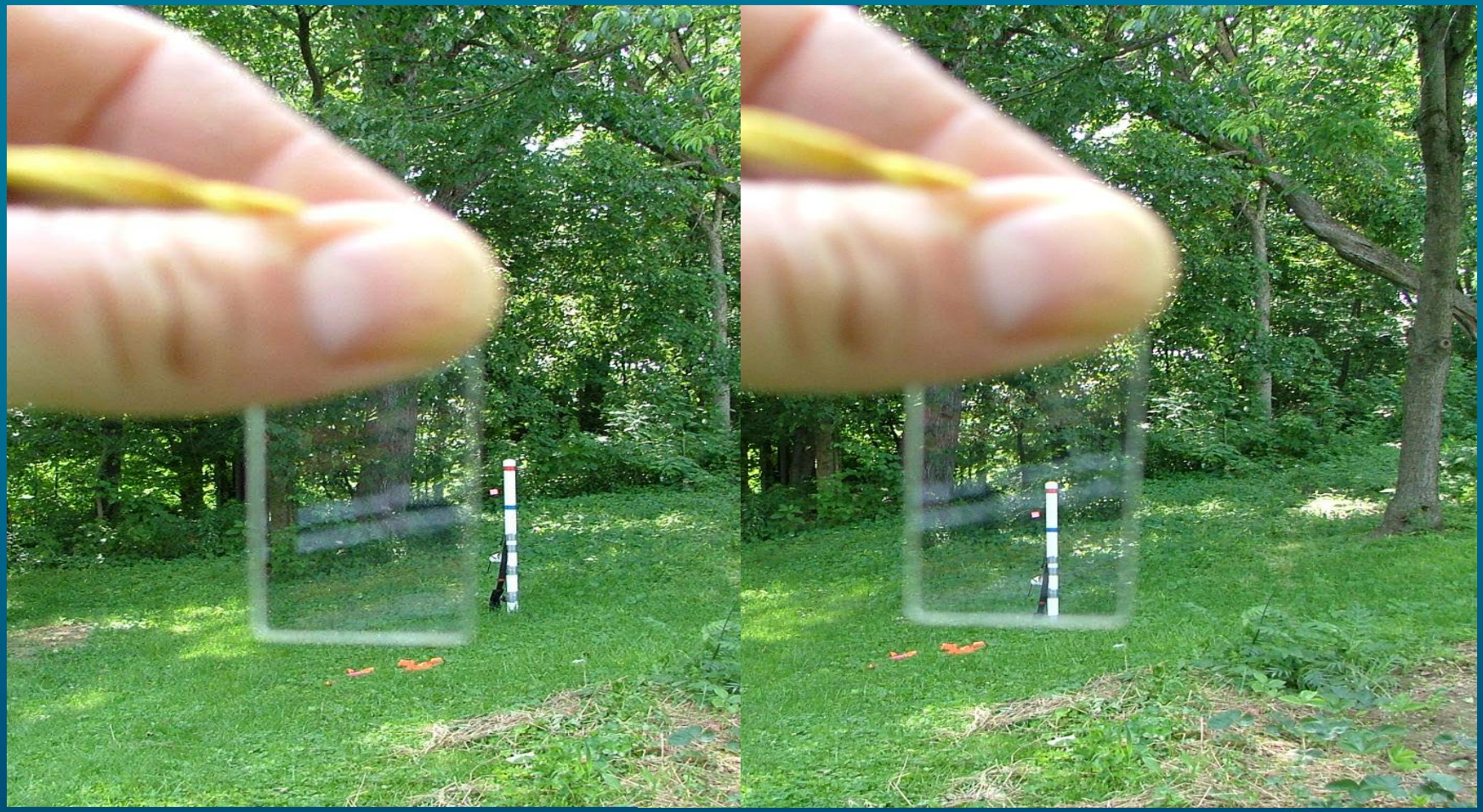
Field Plot Setup
Bottom Land Hardwood Forest

PORTS FUTURE

Field Plot Setup

PORTS FUTURE

Field Plot Setup



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Field Data Collection

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Shallow Soil Assessment

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Field Tools

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Data Collected in Quantitative Plots

- Tree species by name, diameter, count, age, vigor
- Vines, shrubs and saplings by name, count, height, age
- Herbs and grasses by name, % cover
- Shallow soil characterization by layer characteristics, drainage
- Forest floor by organic thickness, % and size of woody debris
- Slope, aspect, disturbance, fauna sign/nests

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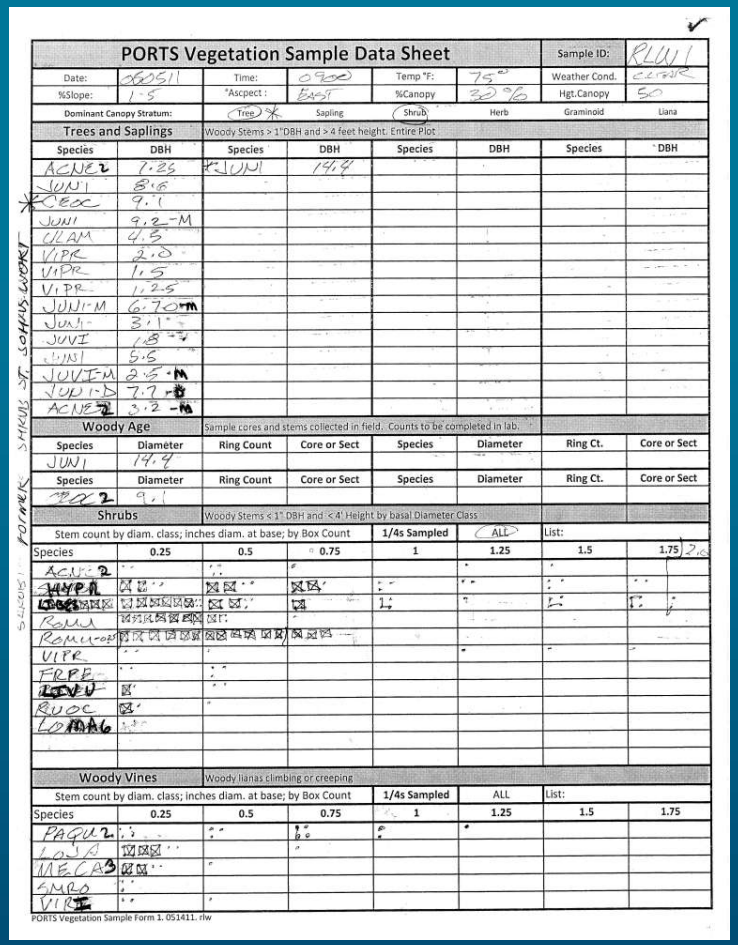
Data Storage and Analysis

Quantitative Sampling Data Sheets



PORTS Vegetation Sample Data Sheet — Sample ID: RLW1

Date:	Time:	Temp °F:	Weather Cond.
060511	0900	75°	CLEAR
%Slope: 1-5	*Aspect: EAST	%Canopy 30%	Hgt.Canopy 50

Dominant Canopy Stratum: (Tree) Sapling (Shrub) Herb Graminoid Liana

Trees and Saplings — Woody Stems > 1" DBH and > 4 feet height. Entire Plot

Species	DBH	Species	DBH	Species	DBH	Species	DBH
ACNE2	1.25	*JUNI	19.9				
JUNI	8.6						
*CEOC	9.1						
JUNI	9.2-M						
ULAM	4.5						
VIPR	2.0						
VIPR	1.5						
VIPR	1.2-5						
JUNI-M	6.7 m						
JUNI	3.1						
JUVI	1.8						
JUNI	5.5						
JUVI-M	2.5 M						
JUNI-D	7.7 M						
ACNE2	3.2 M						

Woody Age — Sample cores and stems collected in field. Counts to be completed in lab.

Species	Diameter	Ring Count	Core or Sect	Species	Diameter	Ring Ct.	Core or Sect
JUNI	19.9						
Species	Diameter	Ring Count	Core or Sect	Species	Diameter	Ring Ct.	Core or Sect
CEOC	9.1						

Shrubs — Woody Stems < 1" DBH and < 4' Height by basal Diameter Class

Stem count by diam. class; inches diam. at base; by Box Count — 1/4s Sampled (ALL) List:

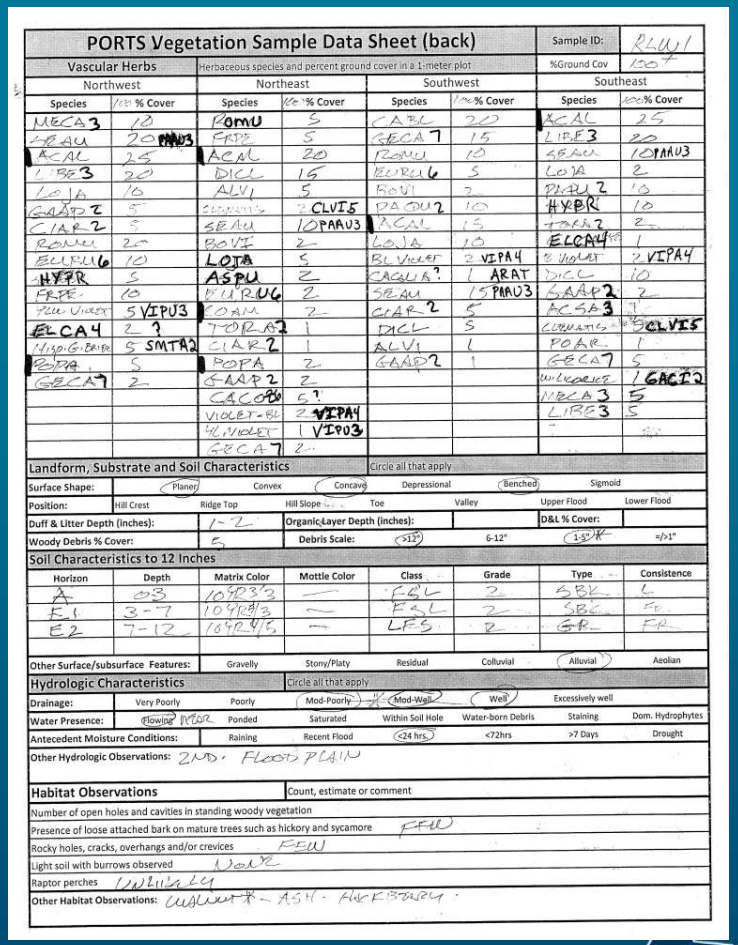
Species	0.25	0.5	0.75	1	1.25	1.5	1.75
ACNE2							
HYPR							
LONI							
ROMU							
ROMU-02							
VIPR							
FRPE							
LOVU							
RUOC							
LOMA6							

Woody Vines — Woody lianas climbing or creeping

Stem count by diam. class; inches diam. at base; by Box Count — 1/4s Sampled (ALL) List:

Species	0.25	0.5	0.75	1	1.25	1.5	1.75
PAQU2							
LONI							
MECA3							
AMRO							
VIRI							

PORTS Vegetation Sample Form 1. 051411. rlw



PORTS Vegetation Sample Data Sheet (back) — Sample ID: RLW1 — %Ground Cov 100

Vascular Herbs — Herbaceous species and percent ground cover in a 1-meter plot

Northwest Species	% Cover	Northeast Species	% Cover	Southwest Species	% Cover	Southeast Species	% Cover
MECA3	10	ROMU	5	CABL	20	ACAL	25
SEAU	20 PAAU3	FRPE	5	GECA7	15	LIBE3	20
ACAL	25	ACAL	20	ROMU	10	SEAU	10 PAAU3
LIBE3	20	DICL	15	EURU6	5	LOJA	2
LOJA	10	ALVI	5	ROVI	2	PAQU2	10
GAAP2	5	[illegible]	2 CLVI5	PAQU2	10	HYPR	10
CIAR2	5	SEAU	10 PAAU3	ACAL	15	TORA2	2
ROMU	20	ROVI	2	LOJA	10	ELCA4	1
EURU6	10	LOJA	5	BL VIOLET	2 VIPA4	VIOLET	2 VIPA4
HYPR	5	ASPU	2	CACOB?	1 ARAT	DICL	10
FRPE	10	EURU6	2	SEAU	15 PAAU3	GAAP2	2
YEL VIOLET	5 VIPU3	LOJA	2	CIAR2	5	ACSA3	1
ELCA4	2 ?	TORA2	1	DICL	5	[illegible]	5 CLVI5
HYPERICUM	5 SMTA2	CIAR2	1	ALVI	1	POAR	1
POPA	5	POPA	2	GAAP2	1	GECA7	5
GECA7	2	GAAP2	2			[illegible]	1 GACI2
		CACOB	5?			MECA3	5
		VIOLET-BL	2 VIPA4			LIBE3	5
		YL VIOLET	1 VIPU3				
		GECA7	2				

Landform, Substrate and Soil Characteristics — Circle all that apply

Surface Shape: (Planar) Convex (Concave) Depressional (Benched) Sigmoid

Position: Hill Crest Ridge Top Hill Slope Toe Valley Upper Flood Lower Flood

Duff & Litter Depth (inches): 1-2 — Organic Layer Depth (inches): — D&L % Cover:

Woody Debris % Cover: 5 — Debris Scale: (>12") 6-12" (1-3") =/>1"

Soil Characteristics to 12 Inches

Horizon	Depth	Matrix Color	Mottle Color	Class	Grade	Type	Consistence
A	0-3	10YR 3/3	—	FGL	2	SBK	L
E1	3-7	10YR 4/3	—	FGL	2	SBK	FR
E2	7-12	10YR 4/3	—	LFS	2	GR	FR

Other Surface/subsurface Features: Gravelly Stony/Platy Residual Colluvial (Alluvial) Aeolian

Hydrologic Characteristics — Circle all that apply

Drainage: Very Poorly Poorly (Mod-Poorly) (Mod-Well) (Well) Excessively well

Water Presence: (Flowing) PERC. Ponded Saturated Within Soil Hole Water-born Debris Staining Dom. Hydrophytes

Antecedent Moisture Conditions: Raining Recent Flood (<24 hrs.) <72hrs >7 Days Drought

Other Hydrologic Observations: 2ND. FLOOD PLAIN

Habitat Observations — Count, estimate or comment

Number of open holes and cavities in standing woody vegetation

Presence of loose attached bark on mature trees such as hickory and sycamore FEW

Rocky holes, cracks, overhangs and/or crevices FEW

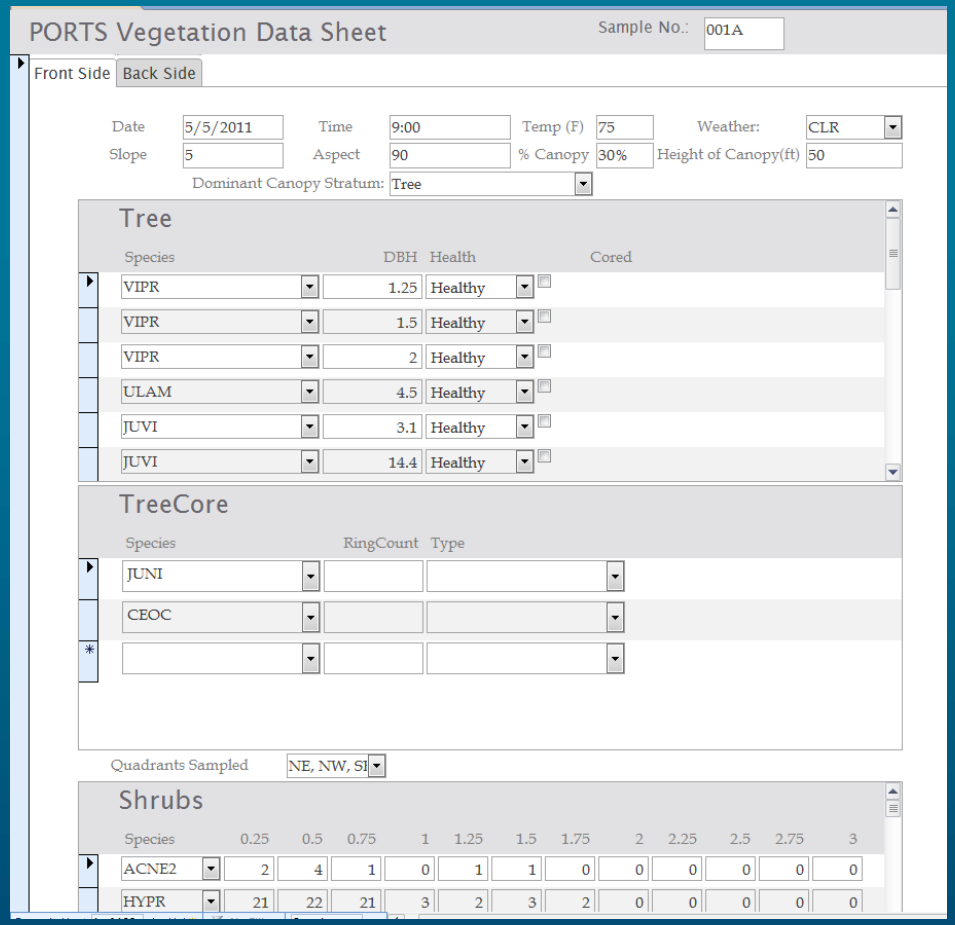
Light soil with burrows observed NONE

Raptor perches WILLOW

Other Habitat Observations: WALNUT - ASH - HACKBERRY

PORTS FUTURE

Field Data Entry



PORTS Vegetation Data Sheet — Sample No.: 001A

Front Side | Back Side

Date: 5/5/2011 | Time: 9:00 | Temp (F): 75 | Weather: CLR
Slope: 5 | Aspect: 90 | % Canopy: 30% | Height of Canopy(ft): 50
Dominant Canopy Stratum: Tree

Tree

Species	DBH	Health	Cored
VIPR	1.25	Healthy	
VIPR	1.5	Healthy	
VIPR	2	Healthy	
ULAM	4.5	Healthy	
JUVI	3.1	Healthy	
JUVI	14.4	Healthy	

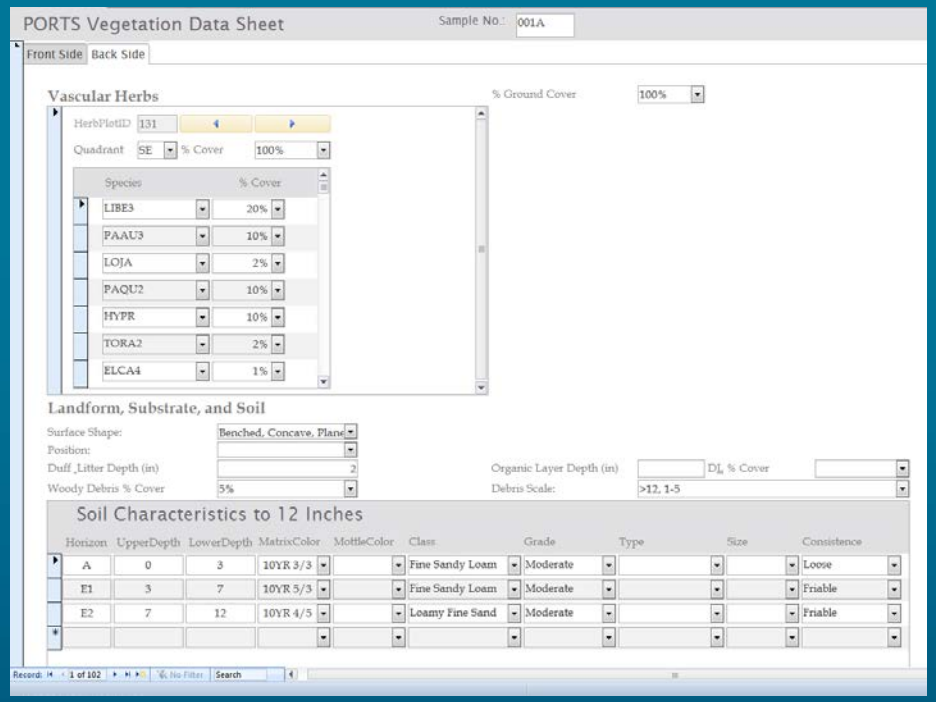
TreeCore

Species	RingCount	Type
JUNI		
CEOC		

Quadrants Sampled: NE, NW, SI

Shrubs

Species	0.25	0.5	0.75	1	1.25	1.5	1.75	2	2.25	2.5	2.75	3
ACNE2	2	4	1	0	1	1	0	0	0	0	0	0
HYPR	21	22	21	3	2	3	2	0	0	0	0	0



PORTS Vegetation Data Sheet — Sample No.: 001A

Front Side | Back Side

Vascular Herbs

% Ground Cover: 100%

HerbPlotID: 131
Quadrant: SE | % Cover: 100%

Species	% Cover
LIBE3	20%
PAAU3	10%
LOJA	2%
PAQU2	10%
HYPR	10%
TORA2	2%
ELCA4	1%

Landform, Substrate, and Soil

Surface Shape: Benched, Concave, Plane
Position:
Duff_Litter Depth (in): 2
Woody Debris % Cover: 5%
Organic Layer Depth (in):
DI_ % Cover:
Debris Scale: >12, 1-5

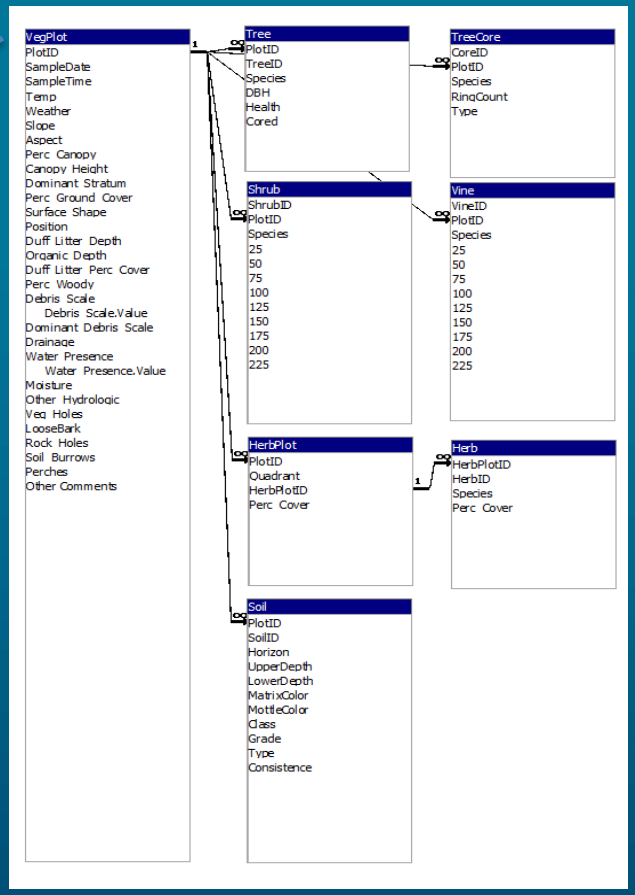
Soil Characteristics to 12 Inches

Horizon	UpperDepth	LowerDepth	MatrixColor	MottleColor	Class	Grade	Type	Size	Consistence
A	0	3	10YR 3/3		Fine Sandy Loam	Moderate			Loose
E1	3	7	10YR 5/3		Fine Sandy Loam	Moderate			Friable
E2	7	12	10YR 4/5		Loamy Fine Sand	Moderate			Friable

Record: 1 of 102 | No Filter | Search

PORTS FUTURE

Quantitative Field Database Structure



PORTS FUTURE

Data Collected in QA/QC Plots

- Canopy dominants by species and size class
- Understory dominants in forest
- Weed dominants (if weedy)
- Delineation confirmation

PORTS FUTURE

QA/QC Sampling Data Sheets

QA/QC Plot Field Data Sheet

Polygon No.	247	Sampler Initials:	GC, ND			GPS Name:	✓
Cover Type Confirmed?	(YES)	NO	(Circle one)			**Date:**	11-2-11
If NO, New Name:							
Structure/Life Form:	Tree	Sap/Shrub	Vine	Herb		Graminoid	Aquatic

Canopy Dominants		**Sub-Dominants**		**Weeds**		**NOTES**
Species	**Diam Class**	**Species**	**Diam Class**	**Species**	**% IV**	
ACSA3						
Reference 223B						

Polygon No.	92	Sampler Initials:	GC/ND			GPS Name:	✓
Cover Type Confirmed?	YES	(NO)	(Circle one)			**Date:**	11-2-11
If NO, New Name:	PINE OAK Mature MIX						
Structure/Life Form:	(Tree)	Sap/Shrub	Vine	Herb		Graminoid	Aquatic

Canopy Dominants		**Sub-Dominants**		**Weeds**		**NOTES**
Species	**Diam Class**	**Species**	**Diam Class**	**Species**	**% IV**	
QUST	22	FAGR	2			
PIVI	24					
QURU	20					
QUCO						

Polygon No.	117	Sampler Initials:	GC/ND			GPS Name:	✓
Cover Type Confirmed?	(YES)	NO	(Circle one)			**Date:**	11-2-11
If NO, New Name:							
Structure/Life Form:	Tree	Sap/Shrub	Vine	Herb		Graminoid	Aquatic

Canopy Dominants		**Sub-Dominants**		**Weeds**		**NOTES**
Species	**Diam Class**	**Species**	**Diam Class**	**Species**	**% IV**	

Polygon No.	117A	Sampler Initials:	GC/ND			GPS Name:	✓
Cover Type Confirmed?	YES	(NO)	(Circle one)			**Date:**	11-2-11
If NO, New Name:	OAK Forest						
Structure/Life Form:	(Tree)	Sap/Shrub	Vine	Herb		Graminoid	Aquatic

Canopy Dominants		**Sub-Dominants**		**Weeds**		**NOTES**
Species	**Diam Class**	**Species**	**Diam Class**	**Species**	**% IV**	
QUAL	12					
QURU	12					

QA/QC Form 102111

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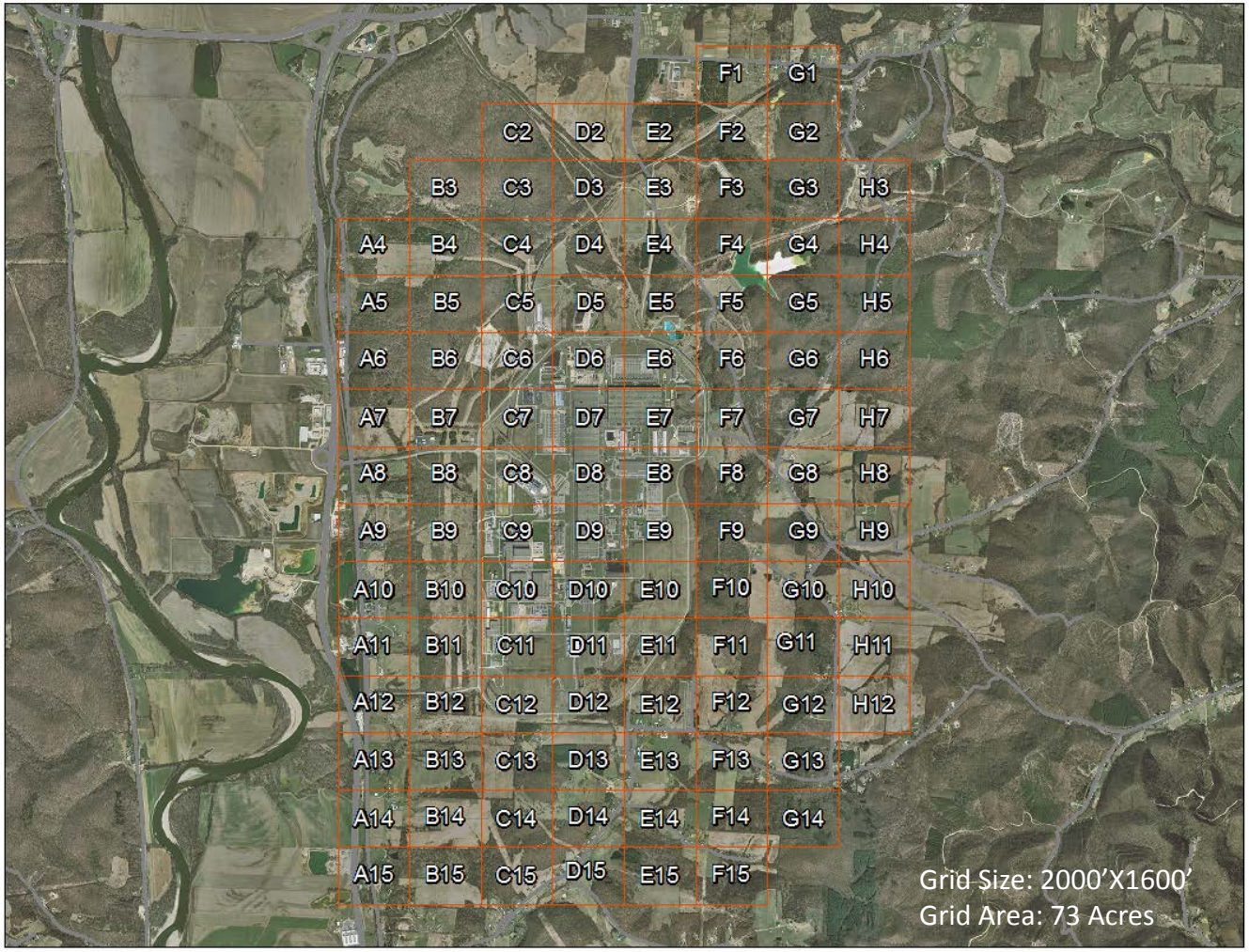
QA/QC Sampling Grid



PORTS FUTURE

Data Analysis

- Habitat Type Characterization
- Biomass, density, diversity, composition
- Forestry analysis, valuation, planning
- Individual species importance values
- Habitat quality and biotic integrity ratings and comparisons
- Habitat suitability modeling per species
- Quantifying management actions, practices and costs
- Quantifying impacts from planned actions

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Plant Species

- So far approximately 420 vascular plant species
- Several are listed on State RTE list
- Species List is the basis for habitat valuations, polygon classification, comparisons, wildlife habitat modeling and land planning

PORTS FUTURE

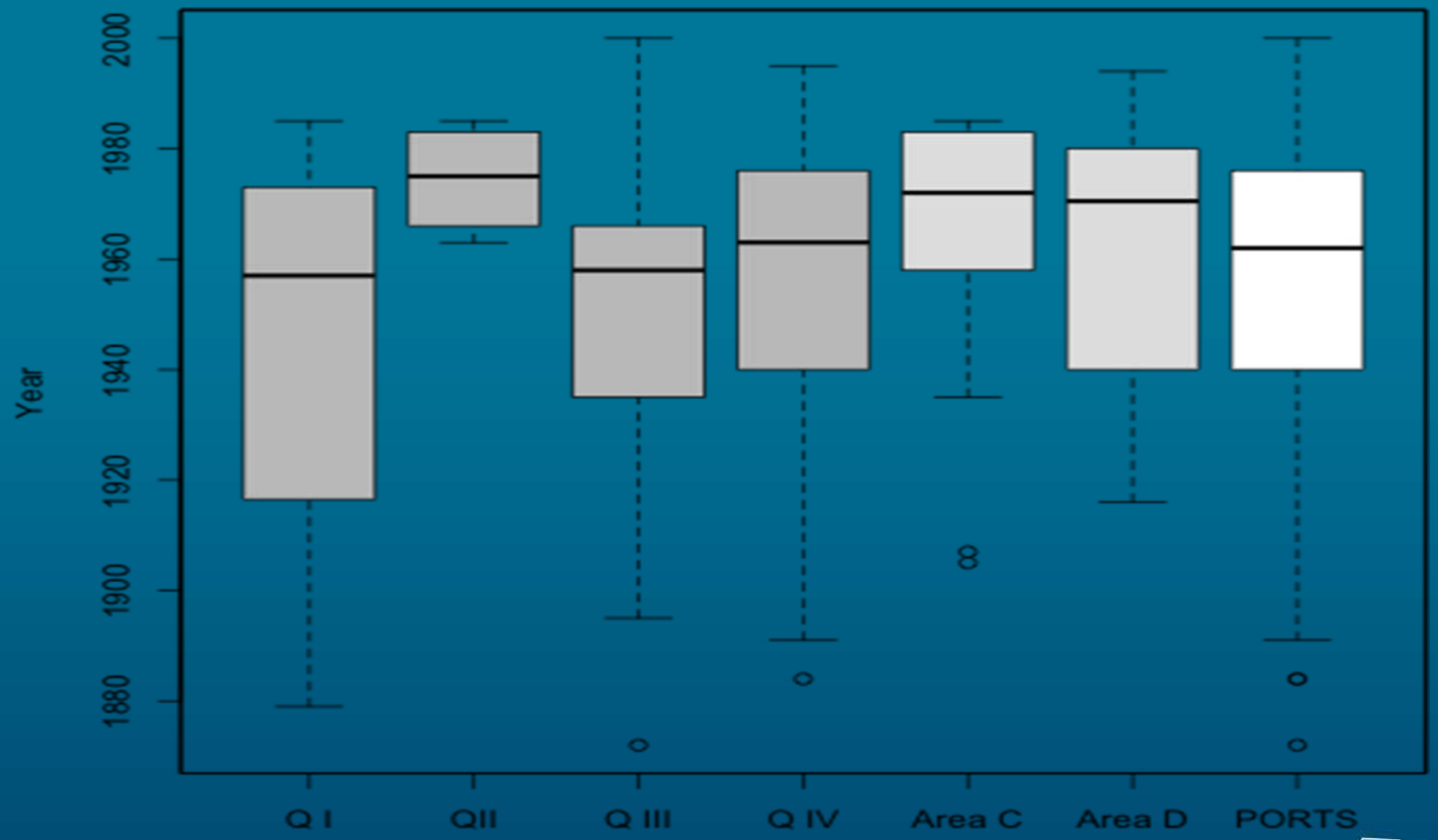
Age of Habitats

Table 1. Woodland age calculations for areas of interest at the PORTS facility in Piketon, Ohio.

Study Area	Age Range	Mean Establishment Year	Mean Age ± SE	Coefficient of Variation (CV)
Quadrant I	1879-1978 (106)	1945	66 ± 5.80	1.76%
Quadrant II	1963-1983 (22)	1974	37 ± 4.40	0.50%
Quadrant III	1872-2000 (128)	1951	60 ± 6.03	1.51%
Quadrant IV	1884-1995 (111)	1958	53 ± 2.53	1.19%
Study Area C	1905-1985 (80)	1964	47 ± 4.55	1.16%
Study Area D	1916-1994 (78)	1962	49 ± 4.68	1.22%
PORTS Entire	1872-2000 (128)	1957	54 ± 1.70	1.23%

PORTS FUTURE

Age of Habitats



PORTS FUTURE

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		Ranunuculaceae	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

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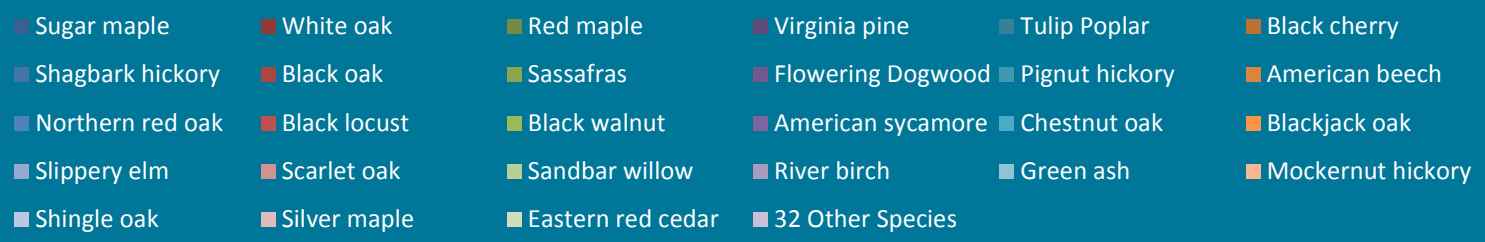
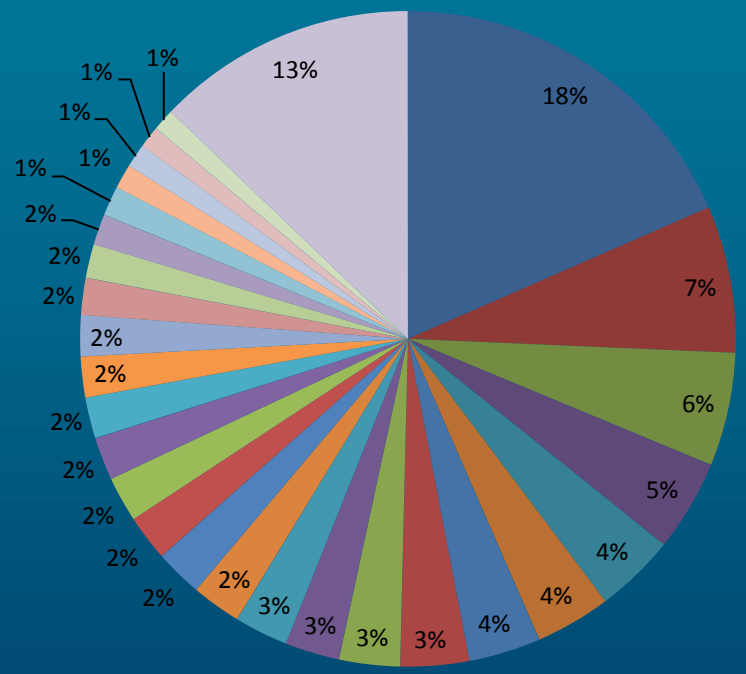
Species Dominance

Woody Species by Importance Values: Species =/>1% (N=27)





Total Woody Species: N=59

Habitat Delineation Process

- Heads Up Digitization: Bringing together the supporting GIS layers and the Field Data

Habitat Delineation Process

GIS Demo

Some Preliminary Observations

- Special Habitats
- Big Trees
- Habitat types
- Uncommon Plants
- Weeds
- Fauna

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Indiana Bat Habitat

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Pike Jackson Scioto

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Successional
Forest

Wet Meadow

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Successional Meadow

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Palustrine Emergent Wetland

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Pike Jackson Scioto

Uncommon Plants

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Scioto

WEEDS!

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Big Trees

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Wildlife

Spiny Oak-slug Moth

Goose Nest

Black Kingsnake

Monarch on Swamp Milkweed

Hercules Beetle

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The Buckeye

Bird-Poop Caterpillar (Swallowtail)

Female Coyote followed by the marking Male Coyote

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Next Steps to Project Completion in Fall of 2012

- Completion and field checking of delineation
- Conduct limited spring resampling of quantitative plots
- Layout 20-50 new quantitative plots
- Complete species list (expectation 500-600 final)

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Next Steps to Project Completion

- Complete data storage and QA/QC
- Complete Analyses
- Present findings
- Suggest some initial land and wildlife management approaches
- Prepare Final Report

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TICKS!

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