ASCC Data Collection and Implementation Timeline

Mississippi National River and Recreation Area (MNRRA)
Adaptive Silviculture for Climate Change Workshop
March 25-26, 2019

GUIDING PRINCIPLES

- ASCC is a multi-site project
- ASCC's primary experimental objectives and core study questions apply to every site
  - Some level of standardization is required for basic sampling
- Additional, system-specific or regionally-specific experimental objectives and questions are encouraged at individual sites
  - Some relevant data may be collected to address primary experimental objectives
  - Additional data may be needed to answer secondary questions
- The core study design has some flexibility, but general principles should be maintained across all sites

Core Management Questions

Conceptual

1) Will adaptation approaches and treatments work in a real-world context to **meet local management goals and objectives**?
2) How **feasible** are the treatments silviculturally, as well as in terms of financial, social, or other management constraints?
3) How does our **idea of desired future conditions** (DFCs) change with each treatment type?
4) What does it mean to deliberately create a future-adapted ecosystem, and **why would a manager choose to do this**?
5) **What tradeoffs exist** between achievement of adaptation objectives and other common objectives for a given region and ecosystem type?

Nagel et al. 2017

CORE SCIENTIFIC QUESTIONS

Hypothesis-driven

1) Do the treatments create significant changes to forest conditions over time at a particular site, and **how do treatments compare across sites**?
2) How do hypothesized treatment responses (DFCs) compare with actual **responses observed in the future**?
3) Do these treatments **achieve** what they were designed for?
4) What **criteria** emerge to enable managers to identify which treatments perform best?
5) Does one type of treatment (resistance, resilience, transition, or no action) consistently **perform better across all sites**?

Nagel et al. 2017

KEY MONITORING VARIABLES ACROSS THE NETWORK

Key Response Variables to be collected at each ASCC site

	Species Composition	**Forest Health**	**Productivity**
Overstory	Species richness Species diversity Relative density Relative dominance	Mortality Crown density Crown dieback Live crown ratio Tree damage (DSI)	Biomass increment Basal area increment
Midstory	Species richness Species diversity Relative density Relative biomass	Relative density or biomass of invasive species	Biomass increment
Ground Layer	Species richness Species diversity Percent cover by species	Percent cover of invasive species	Biomass increment

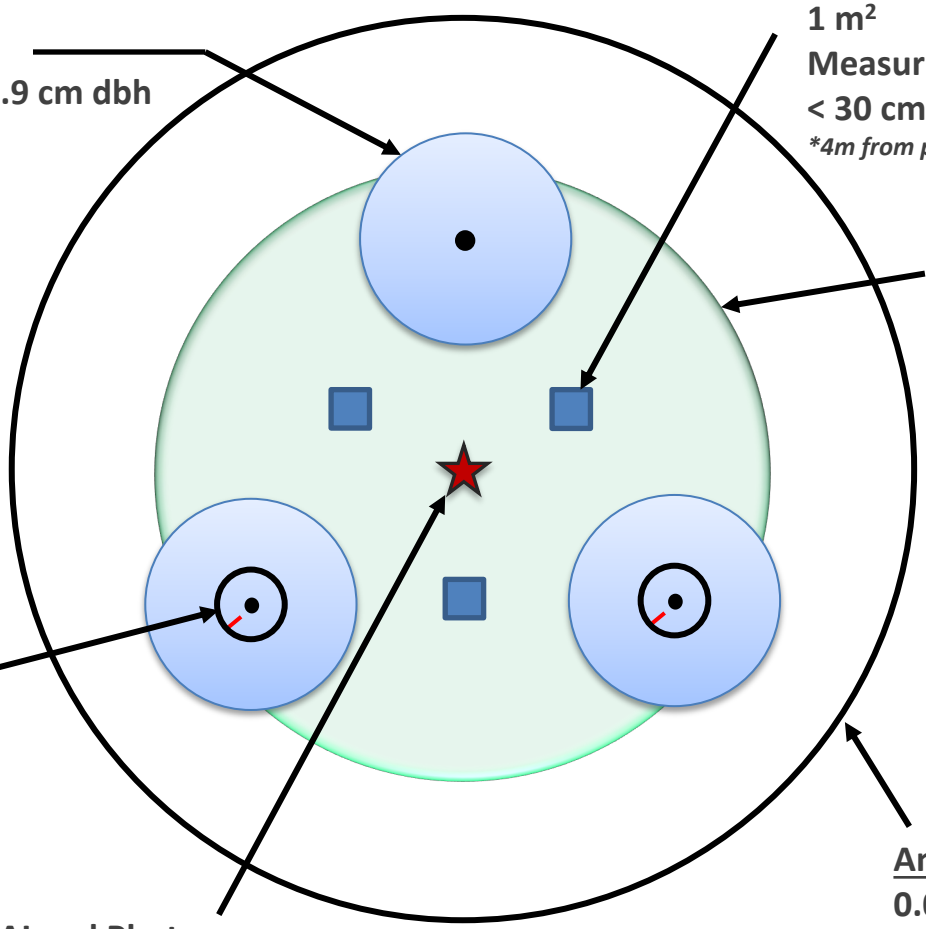
GENERALIZED ASCC PLOT DESIGN

Small Tree Plot (Adv Regen) (3)
0.004 ha (1/100th ac)
Radius 3.59 m (11.8 ft)
Measuring ≥ 30cm tall to ≤ 8.9 cm dbh
(≥ 1 ft tall to ≤ 3.5 in dbh)
8m from plot center at 0, 120 and 240°

Class I	1 – 4.5 ft in ht
Class II	> 4.5 ft ht – 0.5 in DBH
Class III	0.6 – 1.5 in DBH
Class IV	1.6 – 2.5 in DBH
Class V	2.6 – 3.5 in DBH

Ground Layer Plot (3)
1 m²
Measuring herbaceous and woody spp
< 30 cm (1 ft) tall
4m from plot center at 60, 180, and 300°

Mid-Tree Plot (Sapling) (1)
0.04 ha (1/10th ac)
Radius 11.34 m / 37.2 ft
Measuring 8.9 to 12.6 cm dbh
(3.5 to 7.4 in dbh)



Shrub Plot (2)
5 m²
Radius 1.26 m (4.13 ft)
Tally by species

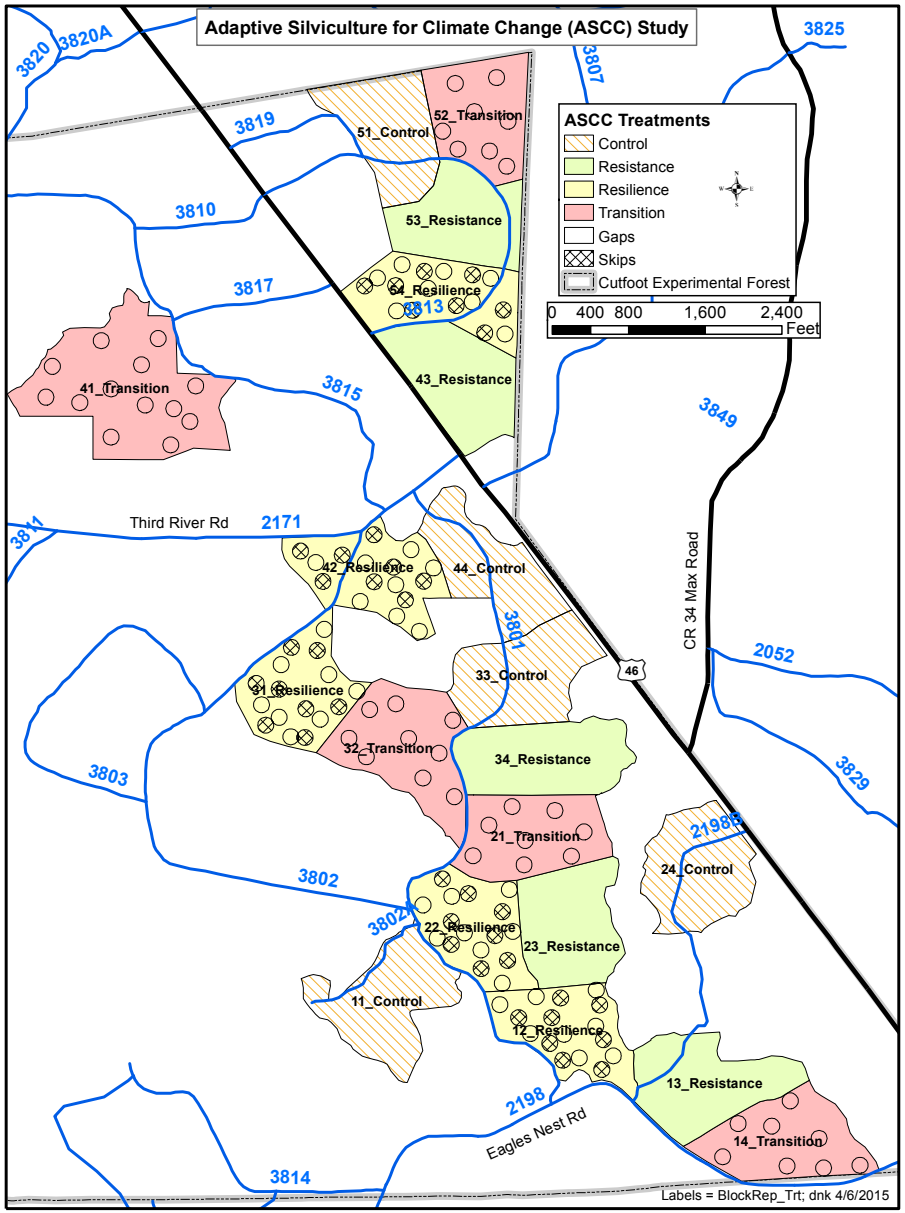
LAI and Photos

Annular Plot (1)
0.08 ha (1/5th ac)
Radius 16.1 m / 52.7 ft
Measuring ≥ 12.7 cm / 7.5 in dbh
Species, Ht, DBH, snags + decay class, forest health metrics

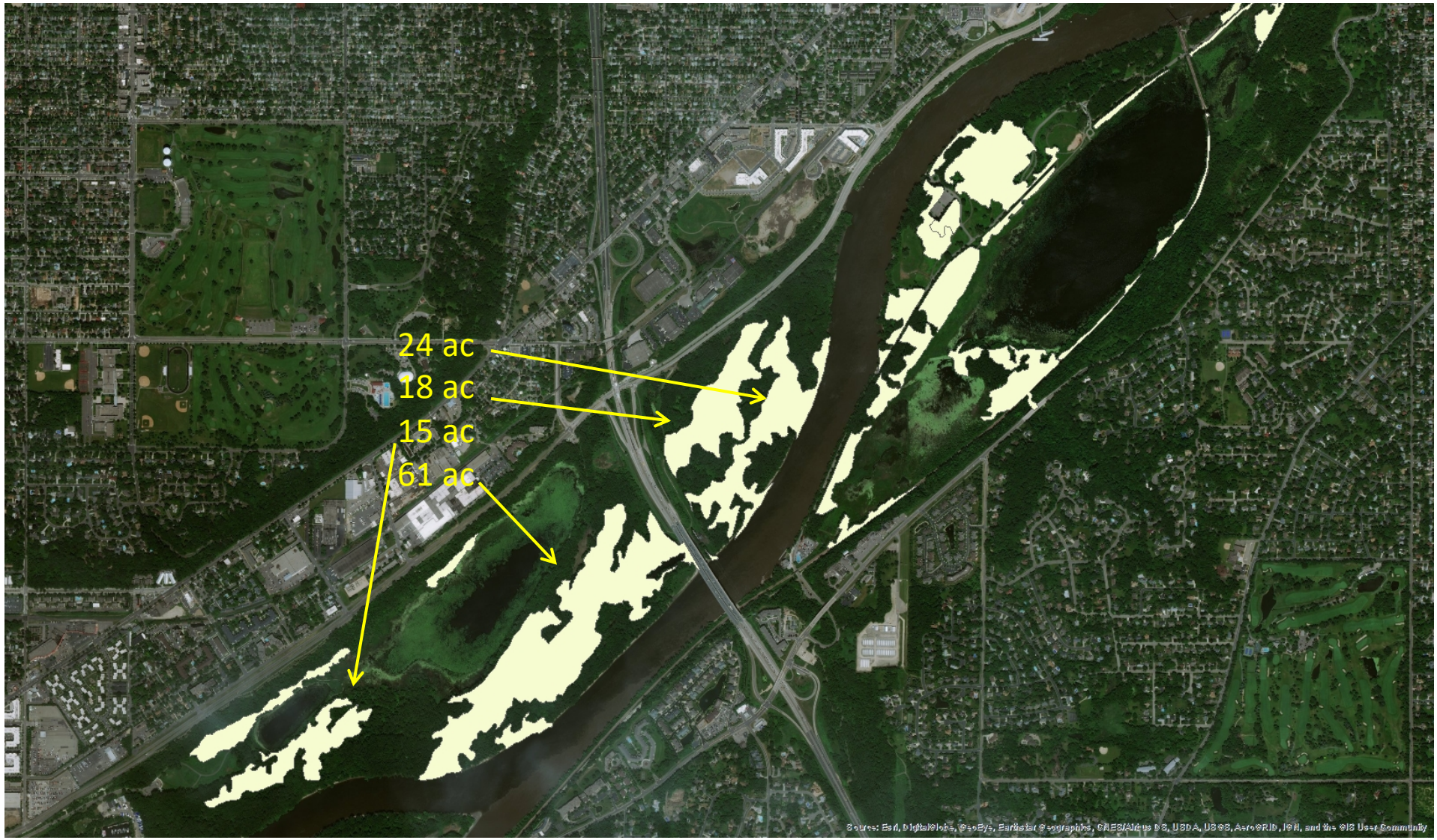
CHIPPEWA NATIONAL FOREST / CUTFOOT EXP FOREST

Treatments and Plot Layout

- 5 Replicates (500 ac)
- Control/Resistance
  - 7 plots
- Resilience
  - 3 in gaps
  - 3 in skips
  - 5 in matrix
- Transition
  - 3 in gaps
  - 6 in matrix
- Total Plots = 170



Ash-Elm Mixed Hardwood Forest Phase I Sites: Crosby Farm Regional Park



Other Suggested Variables for Monitoring

- Leaf area index (plot center)
- Down woody debris
- Archived soil cores
- Forest floor samples
- Wildlife

Measurement Frequency

Variable	ASCC Suggestion	Group Ideas
Overstory Layer	1, 3, 5, 10, 15, 20, etc.	
Sapling Layer	1, 3, 5, 10, 15, 20, etc	
Shrub & Seedling Layers	1, 3, 5, 10, 15, 20, etc	
Ground Layer	1, 2, 3, 5, 10, 15, 20, etc	
Forest Health Indicators	1, 2, 3, 5, 10, 15, 20, etc	
LAI	1, 5, 10, 15, 20, etc	

Note: Times listed indicate post-treatment measurements.
A pre-treatment measurement may also be required for many variables.

ASCC Project Timeline – Key Events

Event	Timeframe
Finalize ASCC treatment details	
Is pre-treatment data needed at this stage?	
Select final treatment locations	
Assign treatments to locations	
Develop formal prescriptions	
Environmental assessments	
Order tree seedlings	
Finalize monitoring details	
Pre-treatment sampling (research focus)	
Implement silvicultural treatments (detail steps)	
Year 1 post-treatment sampling	