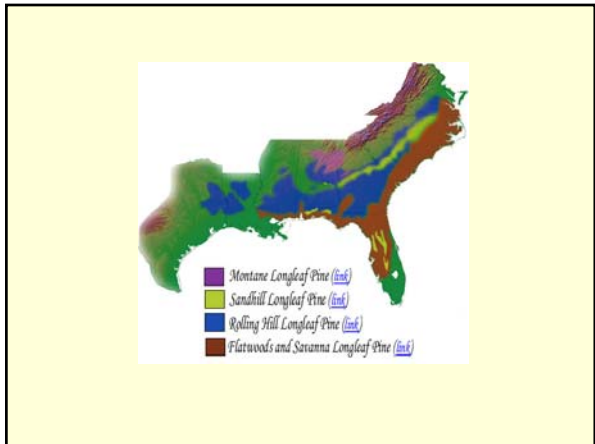
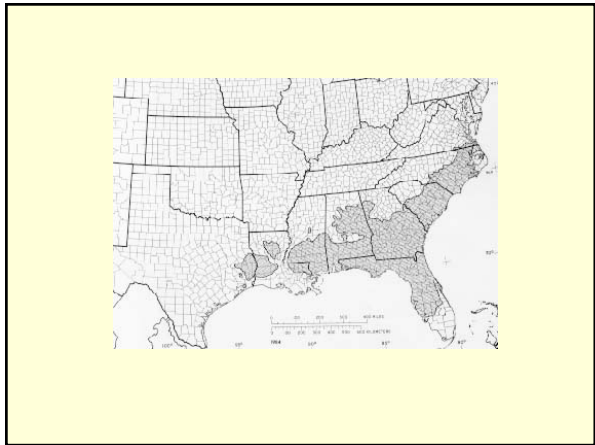
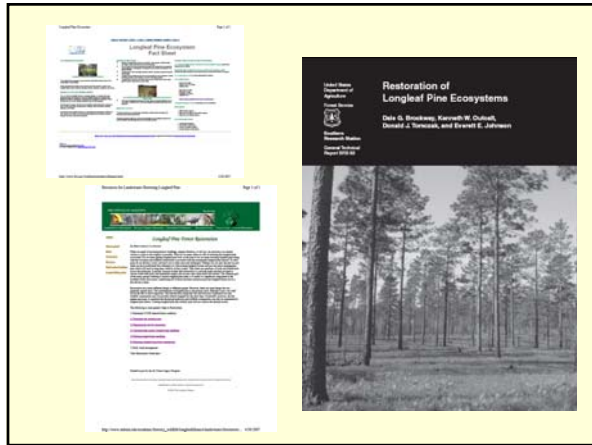
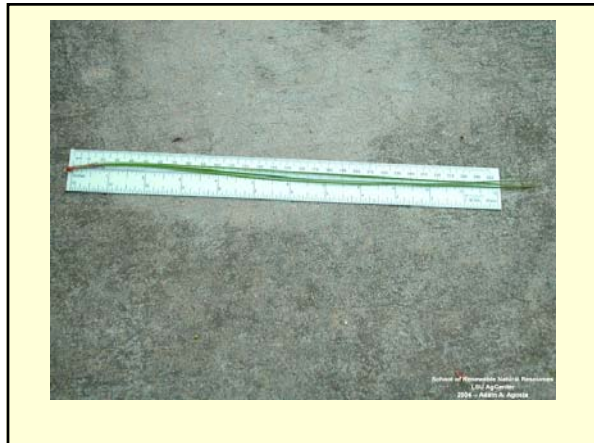


Decision Making in (by?) Design

Using Longleaf Pine restoration as our working example


Quick review of Longleaf Pine





Reasons for Degradation

- fire-suppression
- overgrazing
- forest conversion (especially to loblolly pine, slash pine, sand pine)
- urban development
- invasive plants species (especially cogon grass, privet and kudzu)




Some restoration project tasks

- 1) Determine YOUR desired future condition
- 2) Determine the starting point
- 3) Prepare the site for restoration
- 4) Choose high quality longleaf pine seedlings
- 5) Plant longleaf pine seedlings
- 6) Release longleaf pine from competition
- 7) Manage early stand development

Involves lots of choices



Decision making (process and documentation approach)

Write down **five possible** [site preparation] activities (*options*) from the reading assignment

-
-
-
-
-

Activity

(an aside)

The *options* are candidate DPs. Do you see why?

Do you realize that the options you just wrote are *methods*?

- If you had instead spec'd a site prep "condition" it would be an *outcome*
- but you spec "how to" do something so it's a *method*

Write down *criteria* to use for making [site prep] choices (**write 3-5 now**)

-
-
-
-
-

Suggestion: look at the FRs and Cs that you found in the reading

Activity

(another aside)

Your design decision *criteria* should come directly from your FRs and Cs – if they don't you've either:

- a) forgotten something
- or
- b) made something up

Evaluate possible choices against the criteria using a 10 point scale

10 Perfect	4 Tolerable
9 Excellent	3 Poor
8 Very good	2 Very poor
7 Good	1 Inadequate
6 Satisfactory	0 Useless
5 Adequate	

- You should devise a scale that works for you.
- JLF usually uses five of six definitions and interpolates between them.
- Research to do the evaluation is potentially expensive
- Can use probabilities to examine possible outcomes (another topic)

Will all criteria be equally important?

YES (reasons)

No (reasons)

- | | |
|---|---|
| • | • |
| • | • |
| • | • |

Activity

We can scale the criteria using numerical *weighting factors*

- "Raw Score" X *Weighting Factor* = *Weighted Score*
- Assigning weighting factors can be challenging
 - Understanding the real importance
 - Knowing if there are "non-starters" or "deal killers"
 - Being "pair-wise" consistent
 - If A is twice as important than B
 - And if B is three times more important than C
 - "So then, tell me again how C can be more important than A?"
- Temptation to cheat

Assigning the *Weighting Factors*

- **Make weighting factors add to unity**
- Use categories so only working with 1-3 at a time (criteria trees)
- Do pair-wise checks
- Formal consistency checking (*Analytical Hierarch Process*)
- Don't cheat by anticipating results!!

Make a "decision matrix"

Criteria	WF	Options			
TOTAL	1.0				

Try using your [site prep] options and criteria ("make up" raw scores)

Criteria	WF	Options			
TOTAL	1.0				

Activity

Why this isn't used more

- Reluctance to take the time to do it (formal decision analysis) right
- Possible lack of precision, possible overkill
- Non-linearity and coupling of criteria
- Not wanting to have to explain why you are recommending against your own analysis
- Perception that its inherently dishonest
- Other?

Why it's a good idea to use it

- Documents the decision process
- Transparency
- Leads to discovery of missed or ignored FRs and Cs
- Helps with non-monetary aspects of decisions
- Leads to discovery of inexplicable (often designer's) preferences
- Encourages prioritized research

Its just a tool though so don't use it when it isn't appropriate