DRAFT Minutes from Spatial Analysis Project Technical Team meeting, 6/6/2000
Cloquet Forestry Center
10:00 AM to 3:00 PM

Team members present: Bill Befort, Lawson Gerdes, George Host, Jim Manolis, Tom Ziesler
Team leader: Jim Manolis
Staff support present: Chad Skally (FRC), Daren Carlson (DNR, OMBS)

Submitted by Jim Manolis and Daren Carlson.

Meeting opened with introductions.

Overview of Project:

Jim Manolis provided a summary of the project objectives and goals as follows:

Project Purpose

- The project aims to improve understanding of historical landscape patterns and possible future conditions as a guide for forest planning and management strategies.

- The project will work to determine the value and limitations of spatial pattern data in developing science-based management strategies and in evaluating the consequences of alternative decisions.

Purpose--Strategy Team Vision

- Improve the understanding of conditions and changes in landscapes through the depiction of past, current, and possible future landscape patterns

- Develop effective tools that assess those conditions and changes through an iterative process of implementing, testing, and interpreting

- Identify strengths and limitations in data, in the uses of spatial data, and in the interpretation of analyses

- This effort adds to and does not replace existing planning efforts nor does it address all concerns and issues related to the management of forest landscapes.

Products

- Important Questions – The first product will be a list of important questions related to the management of forest landscape conditions. These questions will guide analysis and development of products.

- Current Forest Conditions – Base maps depicting the current extent, location, and distribution of landscape elements. Analysis of the effects of current forest conditions on wildlife habitat and additional forest resources.

- Retrospective Forest Conditions – Base maps depicting the past extent, location, and distribution of landscape elements. Quantification of change in forest landscape conditions, causes of change, and potential impacts.

- Future Forest Condition Modeling – Projection of forest landscape conditions based on land management and policy scenarios. Evaluation of the extent of change between current forest conditions and possible future conditions and the implications to wildlife habitat and other forest resources.

- Natural Range of Variability – Determination to the degree possible the extent to which current and possible future forest conditions are in-line with the natural range of variability.

Initial Technical Team Tasks

- The PTT will help the PST refine assessment questions and definitions of terms related to the questions.

- The PTT will identify the methods and potential costs to address assessment questions.

- The PTT will meet with the PST and assist them in prioritizing assessment questions

Conducting Analyses

- The PTT will develop a plan outlining the steps needed to answer the refined set of PST questions. Data requirements, methods, timelines, and estimated costs will be included in the plan.

- Using the Technical Team Workplan, Chris Edgar and Jim Manolis will work together to identify options for conducting analyses.

- These options will be proposed to the FRC Landscape Committee, and they will make contract decisions.

Additional Technical Team Tasks

- As analyses are completed, the PTT will review results and products to ensure they are credible and consistent.

- The PTT will present the analyses and results to the PST and work jointly with the PST to establish major findings.

Timeline

- Identify Questions (3/00-8/00)
- Develop Plan (8/00-10/00)
- Conduct Analyses (10/00-12/01)
- Interpret Results and Report Findings (1/01-5/02)

Definitions:

The Strategy Team requested that the Technical Team assist with defining terms. Jim Manolis facilitated in refining definitions related to the Spatial Analysis Project. The strategy team (and others) have struggled with terminology used in vegetation and habitat classification. One role of the spatial analysis project will be to standardize terms. This will facilitate communication and understanding.

Vegetation Communities

- Vegetation Communities consist of native plant communities (NPC's) and their vegetative growth stages (VGS's).

Native Plant Communities

- Native Plant Community ***Classes*** are the potential natural vegetation of a given site, generally defined by understory plant characteristics, soil conditions, and natural disturbance regimes. Also called habitat types or ecosystem types. These classes are stable over time, except for major geological changes or land-use changes.

- NPC's are the "containers" in which natural variation occurs.

The team added "classes" to the definition to indicate the hierarchical level considered. Lawson described terms used for hierarchical levels as defined by DNR's Natural Heritage program (since our discussion these terms have been confirmed with Kurt Rusterholz.). ***Supersystems*** are the broadest level, such as forest vs. aquatic. Supersystems are divided into ***Systems***, such as "Fire-dependent Forest Systems," "Mesic Hardwood Forest Systems," or "Rich Swamp Forest Systems." Systems are divided into ***Classes***. For example, the Fire-Dependent Forest System is divided into Mesic-Mixed Forest, Dry-Mesic Conifer Forest, and Dry Pine-Oak Woodland Classes. Finally, Classes are divided into Native Plant Community ***Types***. Within the Mesic Mixed Forest Class, examples of types are Mesic Great Lakes Pine Forest, or Mesic -Upland White Cedar Forest.

Vegetative Growth Stages

- Existing vegetation composition and age/growth stage within a NPC class or type at any point in time. These stages vary within and between NPC classes and change with succession, disturbance, and management.

The team felt that these definitions for vegetative communities are reasonable, but they want staff to discuss them further with team members not present and other individuals working on community classification.

Landscape Pattern

- Composition, size, shape, and arrangement of landscape elements. Elements can be:
  - -Vegetation communities (NPC's or VGS's)
  - -Landforms, soils etc.
  - -Disturbances (natural, management)
  - -Land use/cover

Disturbance Pattern

- Composition, size, shape, and arrangement of disturbances. Disturbances included in assessment are:
  - -natural disturbances
  - -land use disturbances (e.g. development, agriculture)
  - -management (forest and wildlife management, changes in natural disturbance regimes)

Landscape & Landscape Scale

- Landscape: mosaic of user-defined patches which exhibit ecologically significant differences in terms of composition, structure or function
- Patch: A spatially explicit area which is relatively homogeneous in terms of species composition and/or structure, and distinct from its surroundings

Participants identified that a definition of disturbance is needed.

Addressing Strategy Team Questions:

Following term definitions, meeting participants went over the strategy team table of questions and began filling out the matrix of what are current projects, who are the potential partners, and what are the data sources to address specific questions.

Team members agreed that the "disturbance table" and "vegetation table" should be combined, because they are so closely related.

Sources of and projects dealing with pre-European settlement data were identified and recorded.

George host provided a summary of the Range of Natural Variability (RNV) project. He indicated model completion which provides ranges of Vegetative Growth Stages (VGS) for each of the 8 Ecosystem classes for the historical pre-european landscape of NE MN. They are working on the next step, which is a model which maps the RNV within spatially defined existing Native Plant Community (NPC) Classes for the Northern Superior Uplands. Output of this map provides the potential VGS land area within each NPC class. While this model has a spatial component, it will not be spatially explicit.

Discussion points:

Several points were raised during this process. Some questions will be directed to the strategy team and are also listed below in "Questions for strategy team".

Bill Befort raised the issue of a gradient analysis approach rather than the use of classes. He cautioned the use of arbitrarily defined types and type patches, particularly when presenting maps to the public and implying we know more than we really do. He indicated that GIS/Remote Sensing technology is becoming sophisticated enough to perform rigorous gradient analysis.

Lawson Gerdes pointed out that, when performing releves for the CBS and Natural Heritage Program work, effort is made to place the plots in areas best representing the "central concept" of the (NPC class). Such plot location deliberately misses transitional areas.

Bill Befort also questioned if we should be focusing on floristic indicators of site variables rather than getting direct site variable information. It was noted that we have much better floristic data than physiognomic (especially soils) data for most areas.

Spatial extent of efforts needs to be defined by the PST. The Technical Team recommended the Laurentian Mixed Forest Province as the geographic region for consideration.

The team discussed the importance of resolution and minimum mapping units used in analysis. The minimum mapping unit used depends on the question but is critical to analysis.

Conceptual Model:

Participants identified that the efforts of identifying data sources and related projects was not the most efficient use of team member's time and that this could be accomplished by staff. Lawson Gerdes suggested, and no one objected, that we take a step back and begin to develop more of a conceptual model into which the questions may be partitioned. Instead of considering each question one-by-one,

The attached diagrams are a result of these efforts.

Questions for strategy team:

What is the spatial extent of analysis efforts?

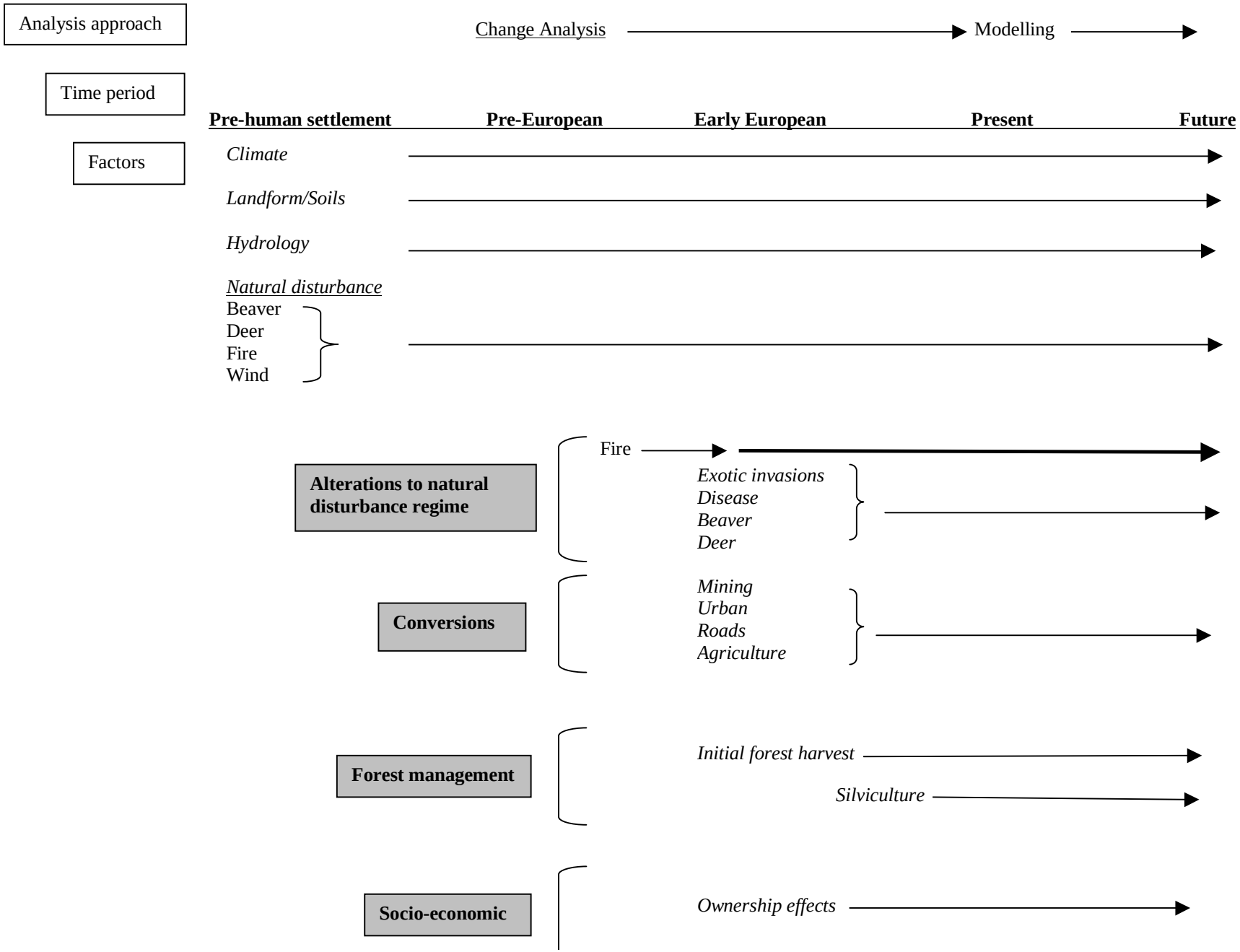
Next steps:

- Staff will provide a draft definition of disturbance to be later reviewed by the PTT.

- Staff will consult with additional experts on vegetation community definitions, including team members not present at the meeting.

- Jim Manolis will relay Technical Team definitions, questions, and discussion points to the Strategy Team.
- Staff will work on identifying methods and potential partner projects to answer strategy team questions.
- The next Technical Team meeting will be held in mid July, Jim Manolis will confirm a date.

Spatial Assessment of Minnesota Forests

Driving factors affecting spatial patterns

Arrows indicate the range of time a factor influences spatial patterns. A given factor's influence likely varies over time.