

Spatial Analysis of Forest Landscape Conditions
Joint Strategy and Technical Team Meeting
Draft Meeting Minutes
February 20, 2001
Cloquet Forestry Center
9:30 AM to 3:30 PM

Strategy Team members present: Jenny Brown, Jim Erkel, Jan Green, Logan Lee (team leader), Dave Miller, Gerry Niemi, Tim O'Hara, and Garrett Ous

Technical Team members present: Bill Befort, Kara Dunning, Lee Frelich, Lawson Gerdes, George Host, Tim Jones, and Jim Manolis (team leader),

Additional attendees: Darren Carlson and Chris Edgar

Minutes submitted by Chris Edgar and Jim Manolis

The joint meeting of the Strategy Team and Technical Team convened at 9:40.

Chris Edgar provided a project update.

- Recommendations for (1) GLO line note interpretation, (2) historical and current aerial photograph interpretation, and (3) spatial analysis of derived data sources were agreed to by the PST and PTT on October 31, 2000.
- The MFRC Landscape Committee reviewed and accepted the recommendations for these study components on November 14, 2000.
- The purpose of today's meeting is to come to agreement on the final two study components (1) future scenario modeling and (2) synthesis/interpretation.
- Assuming consensus can be reached on the final two study components today, they will be presented to the MFRC Landscape Committee on March 6, 2001.
- Request for Proposals (RFP) to conduct the historical and current aerial photo interpretation were sent out in January.
- Three proposals were submitted. Proposals came in two forms: (1) proposals that estimated total costs to conduct all the work and (2) proposals that estimate how much work could be done given the proposed budget.
- It is clear that we will not be able to complete all of the recommended tasks given the funds earmarked. Jim and Chris are considering several scenarios that reduce the scope of work so that we are in-line with the budget. Several options being considered are postponing interpretation of the 1970s photos and reducing the geographic extent of the study. Jim and Chris will prepare a recommendation and present it to the MFRC Landscape Committee on March 6, 2001.
- Work to fulfill other study components is progressing. Jim is working with Dave Cleland of the USFS to conduct the GLO line note interpretation. George Host and Tim Jones are working to select sample areas. Collection of historical photos will commence in earnest once details of the aerial photo tasks are worked out.
- Approximately 87% of the project budget is FY 00-01 funds that will become unavailable if not expended by June 30, 2001. Staff is considering several scenarios to expend as much of

the funds as possible by June 30, 2001. It is unclear at this time what additional actions will be taken to fully expend the funds. Chris will be meeting with the MFRC Landscape Committee on March 6, 2001 to identify options.

Gerry Niemi stated that the reduction in the aerial photo interpretation from that which was recommended is discouraging. He recommended that staff communicate to the MFRC Landscape Committee that more funds be made available so that the work plan can be fully implemented. Jan Green mentioned that the reduction means this project is a pilot and findings for the pilot area cannot be extrapolated to other geographic areas. Jenny Brown asked if we reduce the geographic extent to one subsection, which subsection should we focus on. It was decided to hold this discussion until after the presentation of the two final study components by the Technical Team. Logan asked the teams to consider if a linkage exists between this project and the demonstration forest under consideration by the Commissioner of the DNR.

Jim Manolis presented the Technical Team's recommendations for future scenario modeling.

- Jim reviewed the project purpose, PST's vision statement, and assessment questions.
- Jim mentioned several issues that made development of the future scenario modeling recommendation challenging. First, the PST was less specific in setting direction for the future scenario modeling than for other study components. Second, there are many models in existence that may be used, however they are often mismatched in both scale and purpose. For example, some are optimization models designed to assist harvest schedule planning and others are long term, large scale simulators of ecological processes and forest management.
- The PTT held a meeting specifically to focus on modeling on December 15, 2000 in Saint Paul. Models considered were growth and yield, landscape simulation, and forest planning. Specific models discussed were LANDIS, HARVEST, STANLEY, WOODSTOCK, and Forest Service planning models currently being used by the Superior and Chippewa National Forests.
- The PTT examined the models to see which are capable of modeling potential future scenarios. Average clearcut size, cut dispersion, acres cut, acres thinned, rotation age, and coordination among landowners are examples of the parameters that varied among scenarios.
- Jim mentioned that the Technical Team considered Howard Hoganson's work to be promising, particularly his research efforts to extend the spatial context of his forest management planning model.
- The PTT focused on HARVEST and LANDIS as they were judged most capable in simulating spatial pattern under the scenarios developed.
- Jim discussed at length the capabilities of and differences in HARVEST and LANDIS. LANDIS can model a far greater range of scenarios.
- Two options were put forth for the PST to consider. The first allocated \$51,400 to running LANDIS on the Nashwauk Uplands and Cass County and seeking in-kind resources for a HARVEST demonstration. The second option allocates \$46,400 to running LANDIS on the same geographic area as that in the first option and \$5,000 for a HARVEST demonstration.
- The Technical Team was not unanimously in favor of pursuing HARVEST due to its limited capabilities.
- The Technical Team recommended that LANDIS work be done by Lee Frelich and George Host.

- Products would include detailed description of the scenarios modeled, complete description of the methods and assumptions, model output, maps and graphics summarizing results, discussion of utility and limitations of approach used. It is expected that this work would result in one or more peer-reviewed journal articles.

Jim Manolis' presentation was interspersed with comments and questions from both teams. Logan Lee asked if the team was fully documenting everything. Jim responded that the meeting minutes and the recommendations are documentation of what the team has considered. Logan stressed the importance of keeping a detailed record so that others can track what was considered and how specific recommendations were reached. Logan asked how we can compare the different model types that were considered by the Technical Team. Jim responded that in many cases a direct comparison is not possible as the models are not linked and are generally designed for different purposes. Logan asked if this effort could prioritize areas for linkage. Jim mentioned that researchers are working to add functionality of one model type to that of another.

Dave Miller enquired about the example scenarios that were developed and specifically what they were tied to. Jim responded they were not tied to a specific plan but rather represent future possibilities being discussed in general. Dave recommended that scenarios be tied to desired future conditions.

Tim O'Hara asked if the harvest component in LANDIS is actually the HARVEST model itself. Jim responded that that was not the case. The harvest component of LANDIS is more sophisticated than that in the HARVEST model.

Logan Lee asked Jim to discuss the differences in data requirement of the two models. Jim stated that very little was needed to run HARVEST. It was specifically designed to run on information commonly available (forest type and age class maps). LANDIS, in contrast, has substantial data requirements. Logan asked if we have the data to run LANDIS. Tim Jones answered that we don't have the necessary data wall-to-wall, instead we rely on extrapolating the data that we do have. Jenny Brown enquired about the resolution of LANDIS. Tim responded that the resolution can be as good as 10 m.

Tim O'Hara asked how succession was accounted for in LANDIS. George Host commented that succession is not pre-determined. The successional component is based on life history traits of species in the sense of the work by Craig Loehle.

Kara Dunning asked who the audience is. Jim Manolis responded that the PTT, PST, and MFRC are examples of audiences. Jan Green stated that the project was of interest to a broad range of groups, many of whom are on the MFRC.

Tim O'Hara asked if the information gleaned from the historical and current aerial interpretation could be used to test LANDIS. Tim Jones responded that would be ideal, however he's unsure if that could be done within the budget constraints. Jan Green commented that it would be difficult to reconstruct the land use management practices that occurred between the 1930s and 1990s.

Jenny Brown asked about sensitivity analysis and whether the model will respond differently from landscape to landscape. Tim Jones stated that a sensitivity analysis of LANDIS has been published.

The possibility for linking the future scenario modeling and the demonstration forest idea being considered by the Commissioner of the DNR was discussed. Jim Manolis stated that there may be a mismatch of scales in that the future scenario modeling was going to be applied at large landscapes (subsection) and the demonstration forest may be a smaller area on the order of several townships. Areas under consideration for the demonstration forest are in the Nashwauk Uplands which is a subsection being proposed for future scenario modeling. The teams decided that the uncertainty about the size and location(s) of a demonstration forest preclude the establishment of a linkage between this project and the demonstration forest effort at this time.

Tim O'Hara stated that the modeling proposal is insufficient as it focuses on one model rather than comparing several models. Tim stated that until the Landscape Committee provides the necessary resources to look at several models, the money currently earmarked for modeling should instead be put into the interpretation of historical and current aerial photographs. Tim also stated that any recommendation should discuss the FIA data and how it can be used in the analysis. Jim Manolis responded that an alternative model, Hoganson's model, is being used on national forest lands. Jan commented that this project is a pilot and the model will be applied to the pilot area, a fraction of the total forest land base. She also stated the goal was not prediction but rather to examine the effects of forest management practices on spatial pattern. Jenny Brown suggested that the model be rigorously tested to ensure it is adequate.

Chris Edgar identified three options. The first was to apply 1 model (LANDIS) on two geographic areas (Nashwauk Uplands and Cass County) consistent with the original recommendation of the PTT. A second option was to apply two models (LANDIS and another) on one geographic area (Nashwauk Uplands). The money saved by not running LANDIS for Cass County could be used to run the other model on the Nashwauk Uplands. The final option was to apply 1 model (LANDIS) on 1 geographic area (Nashwauk Uplands). The money saved by not running LANDIS for Cass County could be used to rigorously validate and test the LANDIS model.

Logan Lee asked Jim Manolis if the Technical Team focused on LANDIS because the team has LANDIS expertise. Jim responded that the team does have LANDIS expertise and that did influence the recommendation. Jim reminded the PST that a series of models from several different schools of thought were considered by the Technical Team. Several team members reported that LANDIS has been peer-reviewed extensively, more so than other models. Logan asked Jim if it would be possible to explore another model in addition to LANDIS. Jim stated that it was possible, but given timelines and budget constraints it would be difficult.

Jan Green commented that Tim O'Hara's proposal would set this project back to where it was early last year. Jim Erkel suggested the proposal was an attempt to kill the whole effort. He recommended that the team vote on the two proposals. The team preferred to continue the discussion in an attempt to find consensus.

Logan commented that testing multiple models was not a specific charge. She asked Jim Manolis if the PTT considered limitations and decided LANDIS was the best model to answer the questions. Jim responded yes.

A letter dated February 18 from Alan Ek to Jim Manolis was passed out. Chris recommended that the teams look over Alan's comments to the two proposals during lunch.

Lunch was taken.

Jim presented the PTT recommendations for the synthesis/interpretation study components.

- Jim reviewed the old proposal that called for the preparation of white papers prior to conducting the analysis. He stated that the PST didn't respond favorably to that proposal at the October 31, 2000 meeting.
- A new proposal was crafted. It calls for the establishment of separate taxonomic groups (birds, mammals, reptiles and amphibians, plants, insects and disease), each to have a leader.
- The taxonomic groups would separately hold meetings, conduct literature review, flesh out questions and hypothesis.
- The recommendation does not include modeling. Jim stated that there were insufficient resources to conduct modeling. The GEIS model was considered as a starting point for a modeling effort, but was considered to be too simplistic.

Jim's presentation was interspersed with comments and questions from both teams.

Logan Lee asked Jim to comment on the linkage between this piece and the population viability analysis being conducted by the USFS. Jim commented that there was some overlap and that he and several other PTT members are involved in the population viability analysis. Logan responded that there seemed to be considerable overlap between the two projects. Jim stated that the population viability analysis was using focal species and this project focused on the response of taxonomic groups as a whole. Dave Miller updated the teams on the status of the population viability analysis.

Gerry Niemi suggested that \$7600 per taxonomic group was not much money. The splitting of the funds and work into taxonomic groups would not facilitate discussion of the collective response of wildlife and processes to the change in patterns. He recommended that one group synthesize and interpret the results. People participating in the group should already be familiar with the relatively limited literature on wildlife response to spatial patterns. Studies in Wisconsin, Michigan, and Minnesota would be most appropriate.

Chris Edgar commented, that for the purposes of communicating study results, the synthesis/interpretation piece would be very important. It will be difficult to communicate changes in landscape metrics without the context of what that means for wildlife and plants.

The teams briefly explored the idea of not doing synthesis/interpretation, instead using the funds to bolster other study components. Eventually the teams agreed that synthesis/interpretation should be included in the recommendation.

The teams agreed to allocate \$15,000 dollars to form one team of experts to establish a framework for synthesis/interpretation. The team also recommended that \$21,000 earmarked for synthesis/interpretation in the PTT proposal be shifted to future scenario modeling. The teams requested that the MFRC Landscape Committee provide an additional \$20,000 that can be used to implement the framework for synthesis/interpretation.

Jan asked how the members of the group to conduct synthesis/interpretation would be set. Chris Edgar suggested that the PTT and interested PST members put together a list of names that would then be forwarded to the MFRC Landscape Committee for approval. Chris stated that the Landscape Committee handled the establishment of the PST and PTT teams and that he would like to see the same for the synthesis/interpretation group.

Lawson Gerdes pointed out that the synthesis/interpretation piece was already underfunded and questioned the transfer of what funds are available to other study components. She also recommended that the PTT establish strong linkages with the group working on population viability analysis.

Following the discussion on synthesis/interpretation, the teams revisited the future scenario modeling component. Logan Lee, following discussions with several team members over lunch, suggested that we use LANDIS and compare it to Hoganson's model results for the areas of overlap. Several technical issues related to this proposal were discussed. Dave Miller asked Jim Manolis how one would go about comparing Hoganson's model to LANDIS. Jim responded that the models are not directly comparable as they were designed to do different things. In looking at both models we may get a better idea of what the strengths and weaknesses of the two approaches are.

The teams developed consensus on the following:

- \$51,400 to run LANDIS in Nashwauk Uplands and Cass County.
- \$21,000 to compare Hoganson's model to LANDIS for those areas in the Nashwauk Uplands and Cass County where both models are run (primarily federal lands).
- \$15,000 to form a group of experts to develop a framework for the synthesis/interpretation component.

The teams agreed that the all study components should be applied to the same geographic areas.

The teams directed Chris Edgar to communicate to the Landscape Committee that this project started with addressing spatial patterns for the Laurentian Mixed Province. However, higher costs than expected has resulted in the pairing down to 2, and maybe just 1, ECS Section. The teams strongly encouraged the Landscape Committee to seek additional funds and establish a strategy by which the analysis can be applied across the entire forested part of the state.

The next meeting of the PST-PTT is set for May 15th. The meeting will run from 9:30-3:30 and be held at the Cloquet Forestry Center.

The meeting ended at 3:30 PM.