Summary of Fuels Specialist Feedback on the IFT-DSS Proof of Concept Functionality and Work Flow Scenarios Manuscript

By Stacy A. Drury

On July 16, 2009, the manuscript titled "Refined Work Flow Scenarios and Proposed Proof of Concept System Functionality for the Interagency Fuels Treatment Decision Support System" was distributed to 15 members of the Proof of Concept Test User Group for critical assessment. Responses to the document were obtained from 12 of 15 members of the test user group, were compiled by August 14, 2009, and are summarized in this document.

The test user group's comments were solicited to determine whether the IFT-DSS development team has identified the correct functionality for the IFT-DSS. User responses were collected through a combination of telephone interviews and email responses. When the Work Flow Scenario and Proposed POC Functionality manuscript was presented to the test user group, each test user was provided with the following two questions about the manuscript.

Question 1. Do the work flow scenarios described in the IFT-DSS Work Flow Report cover the range of tasks and objectives that fuels treatment specialists need to perform and meet when planning fuels treatments? Are we missing any specific tasks or broad objectives for fuels planning?

Question 2. Is the functionality as proposed in the IFT-DSS Proof of Concept (Section 3 of the Work Flow Report) useful? Could the POC system as it is described be used by fuels treatment specialists to plan fuels treatments and prescribed burns?

Interviews conducted by Stacy Drury were centered on the questions above; however, the test users were encouraged to discuss any aspect of the work flow manuscript that was of interest to them, evoked concern, or they felt needed to be addressed for any reason (see attached transcripts of phone interviews). This review of the work flow manuscript was not meant to provide a completely unbiased sample, as the test users were self-selected, that is, the test user group consisted of individuals actively engaged in fuels treatment planning who had shown interest in the IFT-DSS and volunteered to provide input to the IFT-DSS development team. However, these individuals were encouraged to be highly critical to ensure that the final IFT-DSS product is useful to the intended end users.

Results:

The responses to Questions 1 and 2 above are summarized in **Table 1**. Overall, the responses to these two questions were very positive (see attached interview transcripts). Test users expressed excitement about the potential for the IFT-DSS to change the way fuels planners do business. Overall, responses to Question 1 indicated that the work flow scenarios were viewed as very inclusive and covered the gambit of tasks that fuels specialists perform when performing fuels treatment planning. Most users reported the IFT-DSS development team was on track with the work flow scenarios and stated that they could not come up with a fuels treatment planning task that was not included in the IFT-DSS work flow scenarios. However, a few users expressed a desire to see more of an ecological focus included in the work flow scenarios. No users could identify exactly how to incorporate and value the ecological benefits in the IFT-DSS, as these benefits may be viewed and assessed differently among regions. Nevertheless, it was repeatedly expressed that many of the tools within the IFT-DSS could be used to identify possible ecological benefits and that perhaps the IFT-DSS might be a stepping stone to developing "an ecological needs tool".

Question 2 also received very positive responses such as, "Yes, I could see that (the POC system) being useful, very much so," as well as "I see usefulness in this" - We might even try it!" and the "POC is great, and the timing is great, as so much emphasis is on fuels planning—this could really help". However, many who answered positively that they thought it would be of use took a wait-and-see attitude with answers such as "I think so," followed by "It is going to be hard to tell until it is in my hands" (see specific comments on attached raw transcripts).

Table 1. Responses to Questions 1 and 2.

	Yes	No
1a) Do the IFT-DSS work flow scenarios cover the common tasks and objectives for fuels planning?	12	0[i]
1b) Is the IFT-DSS missing any specific tasks or broad objectives for fuels planning?	0	12[ii]
2a) Is the functionality as proposed in the IFT-DSS Proof of Concept useful?	12[iii]	0
2b) Could the POC system as it is described be used by fuels treatment specialists to plan fuels treatments and prescribed burns?	12	0

i While there was general agreement that the workflow scenarios covered the common tasks and objectives for fuels planning, a few users showed concern that specifics were missing in some cases.
ii The users indicated that no specific tasks or broad objectives were missing for planning fuels treatments; however, a few respondents indicated that perhaps the IFT-DSS could do more in regard to accessing the ecological benefits of fuels treatments.
iii The most common response to this question was "I think so".

General Comments:

General comments from a subset of users show how users were focused on a number of similar issues:

- Ease of use – if it is not easy to use, then people in the field will not use it.

- Data acquisition (reiterated many times) – if the IFT-DSS can aid fuels treatment planners in obtaining and evaluating data, then it will provide a valuable benefit.

- Mapping tools – mapping tools would be a great benefit.

- Efficiency – if the IFT-DSS proves to be a time saver, it will be successful.

- Ecological assessment – IFT-DSS has potential for developing a tool to assess ecological integrity of fuels treatments.

- IFT-DSS could be an avenue to encourage fuels specialists to use more sophisticated tools and models for fuels planning.

In addition to fuels planning, many of the test users have additional fire suppression responsibilities. In that context, the conversation often turned to comparisons between the IFT-DSS and the Wildland Fire Decision Support System (WFDSS). Most users are rapidly learning the WFDSS, as they are now required to use it for managing wildfire incidents. Several users mentioned that the systems appear to be similar in some ways, as they use many of the same software tools. However, it is important to point out that while WFDSS and IFT-DSS will use many of the same tools, they were designed for very specific and different objectives and have quite different operational requirements. For example, the WFDSS is intended to provide real-time—often in minutes—decision support and documentation of activities for all types of wildland fires, while the IFT-DSS is intended to serve as a decision support tool for mid- to long-term fuels treatment planning. It was suggested that, whenever possible, the IFT-DSS should leverage some of the advances that WFDSS has accomplished, specifically in the way LANDFIRE data are accessed and edited within WFDSS. Several users also commented that IFT-DSS has an advantage in that people in the fire world are in the process of being trained to use a decision support system and will be more "conditioned" to use a system such as the IFT-DSS. To that end, it should be noted that the IFT-DSS development team is currently engaging in discussions with the WFDSS development team to identify potential collaboration strategies to leverage the overlap between systems.

Several users warned that the IFT-DSS team should avoid trying to do too much too soon and should be sure that what is completed is done correctly. They advised the team to be sure to maintain focus and avoid trying to be everything to everybody, bearing in mind that everyone will be looking out for their own personal interests.

Conclusion:

In summary, our group of test users unanimously agreed that the work flow scenarios captured the basic objectives and broad tasks that fuels treatment planners perform on a daily basis. The test user group also unanimously agreed that the POC, as it is proposed, could be useful for strategic planning and prescribed burn planning as soon as it is operational. There was a high level of excitement concerning what was proposed in the refined work flow manuscript,

and the test users are eager to see the graphical user interface mock-ups. Furthermore, the test user group is really looking forward to the seeing the POC functionality.

Finally, one closing optimistic thought from a participant was that the IFT-DSS might be "a bridge between developers and managers".

The following interview notes are transcribed from written notes by Stacy A. Drury of conversations with fuels specialists and fire professionals regarding the functionality of the IFT-DSS Proof of Concept and the completeness of the IFT-DSS Work Flow Scenarios.

Interview notes:

Fire Use Specialist
Rocky Mountain Region
July 21, 2009

-Proficient with FSPro, Farsite, FOFEM, and FlamMap.
-Heavily involved with WFDSS and fire behavior training.

Repeatedly during our conversation stressed the similarities between WFDSS and the proposed IFT-DSS in terms of the models being linked; however, noted that the systems were built for different uses and had different objectives.

Responses to the questions:

1) Do the work flow scenarios described in the IFT-DSS Work Flow Report cover the range of tasks and objectives that fuels treatment specialists need to perform and meet when planning fuels treatments? Are we missing any specific tasks or broad objectives for fuels planning?
	- did not see any holes in the work flow scenarios at this time but expressed that the advanced user functionality would make the system more attractive to her as a more advanced user.
	- also expressed some level of dissatisfaction with the automated FlamMap option in WFDSS. Advised that I look at the Fire Behavior Analyst Assisted version of FlamMap that will eventually be implemented in WFDSS.

2) Is the functionality as proposed in the IFT-DSS Proof of Concept (Section 3 of the Work Flow Report) useful? Could the POC system as it is described be used by fuels treatment specialists to plan fuels treatments and prescribed burns?
	- overall impression was that the proposed POC would be useful and could aid in developing fuels treatment plans and prescribed burn plans.

General Comments:

-felt that having the data acquisition work flow scenario is good but also expressed the opinion that this was basically done in WFDSS with respect to LANDFIRE. Noted that WFDSS currently has applications that makes using LANDFIRE easy (as compared to downloading from the LANDFIRE site).
  -having a tool that helps acquire the data is beneficial.

-expressed satisfaction with the LANDFIRE data editor in WFDSS, stating that "the LANDFIRE date editor works really well" and that having the ability to easily edit LANDFIRE data was a plus.

-liked the proposed ability to upload your own data and fuels treatment locations.

-suggested that we incorporate gridded winds using Wind Ninja as soon as possible, as using gridded winds greatly improves the relevancy of FlamMap fire behavior simulations across the landscape.

-not as interested in the temporal durability of fuels treatments – would rather know more about what the fuels treatment is going to do now to lower potential fire behaviors and fire effects.

-discussed how WFDSS is such a big program that it can be overwhelming. WFDSS has many subtleties and details that tend to confuse people. Also. communication with WFDSS is a problem at this time. Basically the users are given this huge program— mandated to use it—and then not instructed in how to use the decision support modules to help make better decisions. Training sessions (webinars) have tended to focus on the button pushing rather than the thought process.

-suggested that we really think about user help desk, user manuals, and tutorials that are simple to use.

-suggest having a well thought-out communications plan. How will you get the information/training out to the field? The WFDSS and LANDFIRE approach of relying primarily on their respective home pages to distribute information has not been well received in the field.

-warned that we should not go too far too fast – felt that WFDSS has been rushed and parts of WFDSS are clunky and hard to follow as a result. The federal agencies have adopted several less than robustly tested programs in the last couple of years. People are tired of spending their day on the phone with the help desk.

-also warned that people are going to want to a lot more than we are providing (regardless of what we provide), things like wanting every GIS layer that they have to be uploadable.

Interview notes:

Fire and Fuels Planner
Black Hills Region
July 23, 2009

-Proficient with BehavePlus, FSPRO, Farsite, and FlamMap.
-heavily involved with the implementation and refinement of WFDSS and WFDSS fuels data layers.

Responses to the questions:

1) Do the work flow scenarios described in the IFT-DSS Work Flow Report cover the range of tasks and objectives that fuels treatment specialists need to perform and meet when planning fuels treatments? Are we missing any specific tasks or broad objectives for fuels planning?
      - overall positive view of the work flow scenarios.
      - discussed how the work flow scenarios appeared to be really inclusive and had the potential to help with some of the issues and decisions concerning fuels treatments.
      - also discussed possibly using the tools in the IFT-DSS to develop prescriptions for using wildland fire to meet resource management objectives pursuant to the 2009 Wildland Fire Policy (the new 2009 fire policy opens up the door for using wildland fire to meet resource management goals – IFT-DSS could help with the decision process on when a wildland fire could be used as a management tool to meet resource management goals).

2) Is the functionality as proposed in the IFT-DSS Proof of Concept (Section 3 of the Work Flow Report) useful? Could the POC system as it is described be used by fuels treatment specialists to plan fuels treatments and prescribed burns?
      - answered "Yes, absolutely" – but then we discussed how the fact that we are attempting to streamline things and make the access to the tools and data more user friendly was a step in the right direction.

General Comments:

      - mentioned that with the WFDSS implementation if you make the process (in this case using the system) simple and easy to use, you can have a lot of success in furthering the use of the system. Once the users are comfortable and working from an expanded knowledge base, they can expand their use of the models and the science that underlies the models.

      - briefly discussed risk with respect to wildfires.

            - felt that it was helpful to have an indication of the probability a pixel (or portion of the landscape) will burn within a landscape as is proposed for inclusion in

future versions of the IFT-DSS (this is the burn probability concept that is currently in FSPRO and FlamMap).
- discussed how burn probabilities as described are important, as they allow the user to identify areas with values at risk, evaluate the likelihood that a value at risk would be affected by a wildfire within a designated area, and then evaluate how the fuels planners can use fuels treatments to mitigate the probability that potentially adverse fire effects will occur.

Interview notes:

Prescribed Fire Specialist
Southeast Region
July 23, 2009

-Proficient with BehavePlus, FSPRO, Farsite, RERAP, and FlamMap.
-involved with the initial production of the fuel layers for the Southern Wildland Fire Risk Assessment (see discussion below).

Responses to the questions:

1) Do the work flow scenarios described in the IFT-DSS Work Flow Report cover the range of tasks and objectives that fuels treatment specialists need to perform and meet when planning fuels treatments? Are we missing any specific tasks or broad objectives for fuels planning?
- did not see any holes in the work flow scenarios at this time – repeatedly expressed that it appeared we were on the right track.
- also expressed that the proposed option to input FEAT/FIREMON (FFI) plots into the system to create vegetation and fuels layers based on local data would be a real plus.
- thought that having basic and advanced user functionality was attractive.

2) Is the functionality as proposed in the IFT-DSS Proof of Concept (Section 3 of the Work Flow Report) useful? Could the POC system as it is described be used by fuels treatment specialists to plan fuels treatments and prescribed burns?
- the proposed POC looked like something that would be useful and could aid in developing fuels treatment plans and prescribed burn plans.

General Comments:

- was very interested in how to deal with dead fuel accumulation/production – discussed how dealing with dead fuel accumulation was an important issue in the Southeast.
-liked the proposed ability to upload your own localized data.

- discussed how having a localized risk assessment would be very beneficial.

- when asked about the Southern Wildfire Risk Assessment system and the new Wildland Fire Risk Assessment System (WFRAS), expressed a level of concern with the fuels

layers in the Southern Wildfire Risk Assessment, stating that the fuels layers were built on GAP data and were not well matched, resulting in numerous inconsistencies throughout the South. Felt that the fuels data were the limiting factor with the Sanborn approach but when we discussed how WFRAS group is updating their risk assessment to include LANDFIRE data, added that using LANDFIRE data would improve the reliability of the risk assessment.

- expressed interest in the Keith Reynolds' et al., Ecosystem Management Decision Support system (EMDS) approach, stating that he had been looking at these papers and felt the Reynolds' approach had merit and could be useful for fuels treatment planning.

- when I mentioned that there was some criticism that we were not including information about the benefits of fire—e.g., that in some situations high hazard fires as we have defined them are actually beneficial—expressed agreement that stand replacement type fires could have ecological benefits but those benefits were an extra added benefit, and that in his area fuels treatment planners were mainly interested in mitigating hazard and risk to infrastructure and natural resources.

Interview notes:

Fire, Fuels, and Smoke Management Tech Transfer Specialist
Southeast Region
July 29, 2009

-Proficient with BehavePlus, FSPRO, Farsite, FlamMap, NFDRS, FOFEM, and Consume.
-Instructor for NFDRS – heavily involved with the implementation and refinement of NFDRS in the Southeast and determining burning potentials for organic matter in soils.
-FBAN on Fire Incident Team
-Heavily involved with smoke management in the Southeast.

Responses to the questions:

1) Do the work flow scenarios described in the IFT-DSS Work Flow Report cover the range of tasks and objectives that fuels treatment specialists need to perform and meet when planning fuels treatments? Are we missing any specific tasks or broad objectives for fuels planning?

- overall positive view of the work flow scenarios.

- mentioned that he did not see any common tasks and objectives for fuels treatment planning that were missing from the work flow scenarios. And added that he did not think that he could come up with another scenario to supplement what we have currently proposed.

- discussed some concerns that the fire effects models Consume and FOFEM did not adequately address burning potentials and consumption in deep organic soils: i.e., deep duff layers, organic mats, and organic mucks common to many areas in the Southeast.

- however, he also pointed out that he did not know of any specific tools that are available at this time that do provide reasonable estimates of burning potentials and consumption of deep organic soils. He was excited to hear that we would be amenable to adding any tools to the IFT-DSS that addressed burning in deep organic soils as they become available.

- also mentioned that he was not sure if Consume or FOFEM addressed sustained smoldering consumption of forest floors – kind of the same topic, but he felt it was important to note that a lot of their problems with burning and adverse fire effects (smoke emissions, etc.) come from smoldering consumption in deep forest fuels.

2) Is the functionality as proposed in the IFT-DSS Proof of Concept (Section 3 of the Work Flow Report) useful? Could the POC system as it is described be used by fuels treatment specialists to plan fuels treatments and prescribed burns?

- general answer was yes, the proposed functionality would be useful.

-discussed how the strategic planning could be useful but was higher on the planning administration level – might be more of a region scale or interest – discussed how strategic planning is something that perhaps everyone should be doing but it was harder for people to do, harder for some people at lower level positions to understand the need for, but felt it was a good idea to get it out there and people would try it.

-our discussion was much more positive about the prescribed burn planning aspect of the POC.

-discussed how in terms of immediacy we need more field users and prescribed burn planners need more tools. Stated how the pressures on prescribed burning and prescribed burn planners were increasing, especially with respect to smoke emissions and smoke plume modeling. Everywhere they are burning in the Southeast is within 5 miles of a community that does not want to eat smoke. Smoke management is becoming the major concern for prescribed burning and wildfires, and this pressure will only increase.

-stressed that we should get the prescribed burn planning online as soon as possible. Felt that more people will utilize the prescribed burn planning tools immediately and that was one way to get them into the system and using the new tools that were out there.

General Comments:

- In our discussions the question of how we are going to provide default data for fuel moistures came up – discussed how the only game in town for quick access to fuel moistures was NFDRS. Was happy to hear that we were planning on implementing Larry Bradshaw's FireFamilyPlus into the system and were planning on having

connections to the NFDRS fuel moisture maps on WFAS. In addition, agreed that the users should be able to input their own fuel moisture values into the system if they were measuring fuel moisture in some way. Suggested that we also look at Nelson's modeling methodologies for estimating fuel moisture (this is what is currently in FlamMap).

-Data acquisition – discussed how we should be thinking about how to better deal with duff, and in particular deep duff, in the fuel layers we provide. And as new data sources became available, we should have the facility to link to them. Also was agreeable with the idea that you could insert sampled plot data or modify existing data layers to provide better representations of real-world data.

-Fuels treatment over time – commented that this was related to thinking about burning rotation. Felt that although there were problems with the state of the current science, our approach would provide a more "educated guess". Many people are currently using their own insights and experiences to determine how often an area should be burned to maintain lower fire hazard potentials. Felt that what we were offering was better than what people are using now, but felt we should be ready to update our system as the science improves.

-Risk Assessment – Had some problems with the variables that we were discussing using to measure fire hazard – suggested the energy release component (ERC) would be a better unit of measure for determining fire hazard in the risk assessment calculations. In terms of assessing fuel conditions, the ERC is a good indicator of fire potentials and potential for potentially hazardous fires.
> - when I questioned if this would be better if the user could select which fire behavior potentials (fireline intensity, rate of spread, flame length, etc.) best represented fire hazard, he agreed, stating that fire hazards depended on the situation and on your objectives in mitigating fire risk and hazard – what is hazardous in one area may not fit for another area – but at the end of the conversation on risk, he reiterated that the ERC is dominated by fuels and does not consider wind or topography and is often better at estimating potentially hazardous conditions.

On topic of risk assessment, I asked about the Sanborn Southern Wildfire Risk Assessment (SFRAS) and the new WFRAS planned for the U.S. He mentioned that he had a fairly high level of understanding of the system and suggested several pros and cons. Mentioned that Sanborn (and Don Carlton) have come up with some interesting ideas and concepts – but he felt that the SFRAS was not getting as much use as it could because people really do not know how to use it.
> - suggested it would be good if there were someone monitoring and pushing for the use of a system such as SFRAS and helping people use it; my impression was that he felt the system basically needed a cheerleader for the system that could also serve as a help desk/tutor of how to use the system.
> - discussed how in his opinion SFRAS was too heavily based on Rate of Spread and was better for initial attack but may not serve very well for long-term

planning or the reduction of hazardous fuels – e.g., in this case, grass fires (with high rate of spread) would always come up as the most hazardous fuels.

A closing statement was that the user will need to truly understand what the defaults are and the assumptions that go into the models or this is simply a black box and an exercise in button pushing – we need to make sure that the user understands what the model outputs really mean in a real world situation and what is actually happening to the model simulation when they change something. For this to be successful, we need to make sure the user takes the time to understand what is happening behind the scenes so that they are using and interpreting the model outputs correctly.

Interview notes:

Fire Ecologist
Interior Alaska Region
July 30, 2009

-Proficient with BehavePlus, FSPRO, Farsite, and FlamMap.
-heavily involved with the use of the Canadian Forest Fire Danger Rating System (CFFDRS) and the Canadian Forest Fire Behavior Prediction System (FBP) in Alaska.

Responses to the questions:

1) Do the work flow scenarios described in the IFT-DSS Work Flow Report cover the range of tasks and objectives that fuels treatment specialists need to perform and meet when planning fuels treatments? Are we missing any specific tasks or broad objectives for fuels planning?
   - no holes, felt that the work flow scenarios were fairly inclusive and had the potential to help with some of the issues and decisions concerning fuels treatments.
   - overall positive view of the work flow scenarios; felt that the background information was good and that this version was much tighter.
   - expressed concern on how to make this "real" – stressed that she was most concerned with how to make this happen – worried that everyone wants everything that is important to them to be included, and then nothing really gets done.

2) Is the functionality as proposed in the IFT-DSS Proof of Concept (Section 3 of the Work Flow Report) useful? Could the POC system as it is described be used by fuels treatment specialists to plan fuels treatments and prescribed burns?
   - answered "Yes, it could be of use in Alaska", then discussed how we needed to be sure that users could work on a stand scale.
   - felt that the prescribed fire work flow scenario with the stand scale level inputs would get the most use in Alaska.
   - but also stressed that the strategic planning at multiple scales could be of use – if it is available, people may use it – she needed to see it and see how it could be used

General Comments:

- made comment above on her worry that everyone wanting everything could get in the way of the success of the project because people would push for their individual or organizational interests. Then, joking, said that she was now going to push for Alaska.

- stated that it would not get widespread use by many fuels specialists in Alaska if the Canadian FBP system was not available – having the Canadian System implemented is essential for implementation in Alaska.

- we discussed scale a lot – the bottom line was that in Alaska fire specialists are currently conducting fuels planning and prescribed burns on a stand or local scale and that the model needs to be able to handle that – was comfortable with the idea that you could perform stand or point level analysis using the prescribed burn plan scenario.

- was uncomfortable with LANDFIRE layers being the default, as the LANDFIRE data layers are very coarse scale – not sure if people would want to depend on LANDFIRE data.
> - was very concerned with the scale of the fuels layers – wanted to be sure that the fuels layers were available at the proper scale.

- was much more comfortable with using LANDFIRE or LANDFIRE-like data when we discussed how the LANDFIRE data could be edited so that it more closely resembled local data – felt that the ability to edit or calibrate LANDFIRE data was essential for success.
> - liked that the user would be able to upload or enter stand level data in a BehavePlus fashion.
> - also liked that custom LANDFIRE-like or Farsite .lcp files could be uploaded.

- raised some concerns as to whether FVS and FSVeg data would work in Alaska. Stated that FVS does not work in Alaska, as stand data from Alaska was not used to develop and calibrate the model, so the growth simulations from FVS in Alaska are not credible – in dealings with FVS in Alaska, felt that the FVS team was more concerned with having a model and not so concerned with the model providing accurate simulations.

- mentioned that she was growing more comfortable with the FCCS – many of the FCCS plots were measured in Alaska, etc. – felt that there was a lot of promise with the fire behavior predictions that were coming from the FCCS in Alaska.
> -also discussed how FCCS might actually be better to use for fuels treatments in general, because many of the fuel models are so general that they do not capture the changes that were made during treatments – i.e., the fuel models are too coarse to project the influences of the fuel treatments on future fire behavior potential. Many times when you do fuels treatments, the fuels themselves are altered but the fuel model did not change – so if you run fire behavior using the fuel models, no difference between before and after treatment is noted. Discussed

how FCCS captures more of this subtlety, as you are dealing with more real-world fuels and changes that you make are more likely to show up in the simulations.

- mentioned how having WFDSS as a system may be a plus for us, as users will be more conditioned to using a system like the IFT-DSS.

- when we discussed the advantages and disadvantages of having both basic and advanced users, felt it was an advantage to have basic users if it brought them into using the system – allowing them to play around in the system could spark their interest in learning how to use models and what the outputs mean, especially if we take the time to provide background information.

- would be good if we incorporated a customer service representative or agent to help with questions, problems, and interpreting the system.

Discussed how the Boreal Alfresco system had found success by providing services such as performing the analyses for the users – users specify the area they are interested in and what kind of analyses they want done, and the Boreal Alfresco team perform the analysis and pass the data on to the users. This process helped launch the Boreal Alfresco system into management acceptance. We discussed how the Boreal Alfresco model and the associated Scenarios Network for Alaska Planning (SNAP) might have some tools that could do a better job of simulating future vegetation development than the FVS in Alaskan boreal vegetation types.

Closed with an optimistic thought that the IFT-DSS might be a bridge between developers and managers.

Interview notes:

Fire GIS Specialist
Pacific Southwest Region
August 4, 2009

-Proficient with ArcGIS and the production of data layers used in fuels treatment and prescribed burn planning.

Responses to the questions:

1) Do the work flow scenarios described in the IFT-DSS Work Flow Report cover the range of tasks and objectives that fuels treatment specialists need to perform and meet when planning fuels treatments? Are we missing any specific tasks or broad objectives for fuels planning?
- discussed how this potentially could be useful, but took more of a wait-and-see attitude
- was really interested in how this will compare and complement some of the data they have now.

- discussed how the planning tools sound great but still semi-skeptical – however, if IFT-DSS works as advertised and makes planning duties simpler, then could it provide a big benefit.
- mentioned that some things were not clear about what exactly could be done in the strategic work flow document – wanted reassurance that analysis could be done on a forest or park level to identify areas with higher potential fire occurrence and/or fire hazard.
- brought up how where she works there will be data to compare with the IFT-DSS results but felt that the data acquisition and suite of tools in general could be more useful in areas where data do not exist – for those areas, easy access to LANDFIRE data would be a plus – a negative is how to rate the accuracy and applicability of the results when there are no data other than LANDFIRE's.
- could not think of any other scenarios and in the end mentioned that it was "pretty good".

In line with this, we discussed some of the work flow scenarios in greater detail:

For data acquisition, she showed a lot of interest in how the FVS could be implemented and used with FEAT/FIREMON-type data.

> - was very interested in seeing how things like fuels accumulation/succession would be addressed and function in the system – felt it would be a big plus to have the planned functionality to grow vegetation and fuels after fire – was very interested in seeing how this related to what they are doing now.
> - was very happy that the ability to edit fuel models – particularly in LANDFIRE data – was possible.
> - likes that you could upload your own .lcp files.
> - really interested in the FSVeg/INFORMS-type process to incorporate the plot data they have for their area into mapping and fire behavior/fire effects analysis – again thought bringing FVS and an FSVeg type functionality into the system may be beneficial.
>> - had lots of questions about implementing FVS and how to validate the output in areas outside the forest service jurisdiction.

For strategic planning, was a little confused by our use of Area of Interest but appeared relieved to hear that we were looking at this from large-to-small scales

Felt that spatially explicit treatment placement could be really useful and also discussed how the ability to either upload or draw your polygons on the map would be useful – stressed that many fuels specialists would still like their paper maps, so having the ability to print out maps would be useful – also discussed how the ability to locate their fuels treatment subjectively by the user and then test the effectiveness of the treatment would be a plus, because models will not understand how placing fuels treatments is limited by concerns other than mitigating fire hazard and risk to resources.
> - stressed that it would be good to have mapping tools as is proposed in the work flow document.

Risk Assessment: Discussed how, in her opinion, we needed to make sure that it was clear as to how values at risk would be dealt with in the prescribed burn planning.

- Mentioned that she had been using the risk assessment approach in Doug Rideout's Starfire. Said that for strategic planning Rideout's process reinforces what they already know in many cases, but the cost benefit approach really worked well for them. The plus-minus system really lets the user decide whether a fire would be beneficial or negative – liked that the values can be positive or negative as it gets to the fact that not all fires are negative.

2) Is the functionality as proposed in the IFT-DSS Proof of Concept (Section 3 of the Work Flow Report) useful? Could the POC system as it is described be used by fuels treatment specialists to plan fuels treatments and prescribed burns?

- answered – "I think so," but stressed how this remains to be seen – pointed out that the results from the type of analysis that is proposed in the POC might tell us more of what they already know – but was in agreement when asked specifically if it would be useful to document this type of information even if it was already known locally
– will be interested in seeing what fuels managers are able to do with this information once they have it – kind of a "what do I do with the data now" idea.
- stressed how this might be only as good as the LANDFIRE data.

General Comments:

- Mentioned that there is a statewide fire behavior fuel layer in WFDSS for California that we may want to incorporate into the model.

Interview notes:

Fire Ecologist
Southwest Region
August 5, 2009

-Proficient with the INFORMS system, ArcGis BehavePlus, FSPRO, Farsite, and FlamMap.

Responses to the questions:

1) Do the work flow scenarios described in the IFT-DSS Work Flow Report cover the range of tasks and objectives that fuels treatment specialists need to perform and meet when planning fuels treatments? Are we missing any specific tasks or broad objectives for fuels planning?
- general view of the work flow scenarios was positive.
- did not see any big holes or needs that we need to address at this time.

2) Is the functionality as proposed in the IFT-DSS Proof of Concept (Section 3 of the Work Flow Report) useful? Could the POC system as it is described be used by fuels treatment specialists to plan fuels treatments and prescribed burns?

      - answered, "Yes. I could see that being useful – very much so."

General Comments:

      - discussed how the work flow scenarios and the POC would really be a big plus for the NEPA process.

      - mentioned that the strategic planning process looked like it could really help fuels specialists identify what is on the landscape currently – e.g., quantify existing conditions – discussed how it was really important for fuels specialists to know where the problem areas are and they cannot do that without quantifying current conditions.

      - in conversation about the tree-list capabilities, brought up that she liked that we would be incorporating the capabilities of FIREMON and FSVeg in the IFT-DSS following the procedures outlined in INFORMS – felt that making these tools easier to use and more accessible to more users could be very beneficial, as they are fairly difficult to use in INFORMS at present.

      - as an INFORMS user, did not see any problems with how we were proposing to use INFORMS pathways, FSVeg, and the FVS simulator – simply mentioned that INFORMS could be made more useful, as data acquisition and data uploading was not necessarily user friendly.

Interview notes:

Fire Ecologist
Northern Great Lakes Region
August 7, 2009

-Proficient with the FEAT/FIREMON, ArcView Remsoft Behave, FCCS, Consume.

This is a combination of an email message and phone interview notes.

Responses to the questions:

1) Do the work flow scenarios described in the IFT-DSS Work Flow Report cover the range of tasks and objectives that fuels treatment specialists need to perform and meet when planning fuels treatments? Are we missing any specific tasks or broad objectives for fuels planning?

      - Email comment: I don't see any glaring omissions at first glance.

- Phone interview responses follow:

- discussed how, in his opinion, the project has all the pieces that are needed – covers what people do.

- "hit all the bases as far as I can tell" – but then reiterated what was stated in his email message that the problems may wind up being in the system execution.

2) Is the functionality as proposed in the IFT-DSS Proof of Concept (Section 3 of the Work Flow Report) useful? Could the POC system as it is described be used by fuels treatment specialists to plan fuels treatments and prescribed burns?

- answered "I think so" – but it was going to be hard to tell until it was in his hands. Hard to assess until he was able to see it.

- discussed how what makes things useful to him is the user interface – if it is easy and it saves time it will be useful – if not, no one will use it.

- mentioned FEAT/FIREMON – suggested that the usefulness is what you get out of the system.
- felt that the mapping functions as described in the POC section of the document could be very useful – many people struggle with programs such as ArcView.
- making maps for burn plans is necessary and in great demand.
- if you could "give them a crayon and let them draw their units on a map they would be happy".
- suggested incorporating Google Earth, MapQuest – if not these programs, the same or improved functionality – felt that the incorporation of Google Earth and MapQuest functionality is "necessary".
-mentioned that they need the tools to use and manipulate aerial photos.

- discussed how the burn plan requires a table where fire behaviors are evaluated relative to varying winds, varying fuel models, varying fuel moistures, etc. Felt that the ability to produce tables and figures within the model and then easily move them to Word documents would really be a plus – would save time and headaches.

- bottom line statement – "If it doesn't save time – they are not going to use it".

General Comments:

- Email comment: "In my experience with proofing programs (FEAT, FFI) the inclusion of certain elements into the program isn't usually the problem. The problems are in the execution of the processes, the ability and methods in which users import or enter data and the format in which it is exported. FCCS for instance, has some useful data output

but it is in an unusable format which doesn't allow you to use the data elsewhere, at least not easily".
- in follow up discussion, mentioned that it is important for the success of this project that being able to import or cut and paste into MS Office products would be important for the success of this project.

- Phone interview responses follow:

- mentioned that this was a "large beast of a project".

- mentioned how in his area, fuels treatments for reducing fire hazard were not as big a deal – most of the prescribed burning and forest treatments were being done to provide ecological benefits, although they were still calling them fuels treatments and provided some of the same results – but the treatments were more for ecological benefits.

- thought that the IFT-DSS might be sort of a lead in to an ecological needs tool. Discussed how people in forest and fuels management needed a tool that addressed ecological needs and benefits
- Discussed how one would come up with a one-size-fits-all tool to evaluate ecological needs nationwide. Felt that this would be very complicated.
- stressed how some of the outputs from IFT-DSS could be used to assess ecological impacts of the treatments – both mechanical and prescribed burning

- Asked how are we going to access mechanical treatments? Assumed that we were going to use FVS as the engine to deal with mechanical treatments and biomass. FCCS could also be used to assess biomass, especially biomass that is produced during mechanical treatments.

- Had a lot of questions concerning data acquisition –

- was concerned and not exactly sure about tree-list data options and how that was going to fit together – especially with how fuels fit into the question.

Stressed that success will come down to data entry
1) Is the default data good?
2) Can you enter your own data?
3) And is the data entry easy? Also, nobody wants to enter data twice.
- mentioned that he thought we had these issues covered after reading the document, but taking a bit of a wait-and-see attitude.

- mentioned that in general fuels and fire people do not want to see much change.

- we talked a lot about fuels and fuel models.
- stated that he likes custom fuel models and uses the Behave by Remsoft program that incorporates the use of the Canadian Fuel Models.

- was hoping that the model would incorporate the Canadian Fire Danger Rating System, the Canadian fire models, and the Canadian fuel models, as they are used in boreal forest types in the northern states
- wanted the flexibility to easily move from fuel model to fuel model – did not want to have to go back and start a new run every time he wanted to change fuel models.

- he wanted assurance that we were going to provide the ability to move from program to program without having to run another program when the data from the earlier program is not required as inputs – e.g., flexibility to run the programs in a more advanced mode with actual or game-playing data inputs.

- very interested in using the FCCS data system, but was concerned that FCCS data had not been field tested – felt that FCCS might better show changes/influences of mechanical treatments.

- mentioned that it would be beneficial to incorporate the photoseries into the fuel model selection process – felt that using the photoseries and perhaps FCCS may wind up being better than simply picking a fuel model

Finally warned that we should not approach this as a black box – need to provide information on where the data comes from and, if possible, address problems with data interpretation.

Interview notes:

Forester
Northern Mountain States
August 7, 2009

-FBA qualified, more than 30 years in fire and fuels management.

Responses to the questions:

1) Do the work flow scenarios described in the IFT-DSS Work Flow Report cover the range of tasks and objectives that fuels treatment specialists need to perform and meet when planning fuels treatments? Are we missing any specific tasks or broad objectives for fuels planning?
    - the work flows make sense – seem pretty inclusive.
    - appears that it may help us save time, which would make it useful.

2) Is the functionality as proposed in the IFT-DSS Proof of Concept (Section 3 of the Work Flow Report) useful? Could the POC system as it is described be used by fuels treatment specialists to plan fuels treatments and prescribed burns?

- answered that he could see some use for this.
- it may have even helped them do some planning that they have recently completed.

General Comments:

- mentioned that there was some real potential for the fuels management – especially data acquisition and long range planning.
- but we need to think about how the data will be interpreted.
- also would like to see if in future versions of the IFT-DSS, ecological benefits from mechanical or prescribed burn treatments could be included.
- in his area, timber management is big – would like to see if the IFT-DSS would be able to include landscape treatments that were completed for timber management.

Closing Comments:

- "I see applicability for this" (the system as a whole). It would have helped finish a project that they have been working on faster.
- if it helps save time, it will be beneficial – "I see usefulness in this – "We might even try it!"

Interview notes:

AFMO/Fuels Specialist
Northern Mountain Region
August 10, 2009

-Proficient with the NEXUS, BehavePlus, and FOFEM. Familiar with RERAP. Learning FlamMap.

Responses to the questions:

1) Do the work flow scenarios described in the IFT-DSS Work Flow Report cover the range of tasks and objectives that fuels treatment specialists need to perform and meet when planning fuels treatments? Are we missing any specific tasks or broad objectives for fuels planning?
        - scenarios are exactly what fuels specialists do in their everyday job.
        - as I had time to read this my initial impression was that it looks like you are on the right track.

2) Is the functionality as proposed in the IFT-DSS Proof of Concept (Section 3 of the Work Flow Report) useful? Could the POC system as it is described be used by fuels treatment specialists to plan fuels treatments and prescribed burns?
         - answered "Yes, from what I saw it would be useful".
        - "the order of implementation makes total sense".

POC is great and the timing is great as so much emphasis is currently on fuels planning – this could really help

General Comments:

- right now he is struggling with data acquisition and using FlamMap for the first time.
- trying to update LANDFIRE layers.
    - editing is time-consuming in GIS and/or the Farsite .lcp editor.
    - if the IFT-DSS makes it easier to edit LANDFIRE data, this would be a benefit;
    - currently, editing LANDFIRE data is a pain.

Prescribed burning
    – any help to increase productivity and save time would be a plus.
    - having output compatible with Microsoft Office would be useful.
        -everything done in the Forest Service is in MS Office.
        - being able to cut and paste output into Word documents would make life easier.

Data acquisition
    - right now the IFT-DSS is showing three basic data options in the work flow document – He asked if we were thinking that users would be able to mix the three data sources, e.g., use LANDFIRE for some things, tree-list data for others, and user data where it was available.
    - having data flexibility is great.

- has a positive view of the users' ability to add fuels treatment polygons manually – this allows them to locate treatments in areas where it is feasible for them to locate them and then be able to test how the treatment influences fire behavior in both treated and untreated areas using FlamMap to see if the treatment does any good.

With the new geospatial fire behavior course (S-495), people are starting to use FlamMap more.

Closing comment:

On the right path, ideas look good, looks like we are dealing with the practicalities of their everyday jobs.

_____

Interview notes: (Combination of interview and written communication. Interview responses come first, and written responses are presented at the end of this document. Note that both sections provide important insights.)

Fuels Specialist
Inland Northwest Region

August 10th 2009

-Proficient with a wide range of fire behavior and fire effects models. Proficient with ArcGis.

Responses to the questions:

1) Do the work flow scenarios described in the IFT-DSS Work Flow Report cover the range of tasks and objectives that fuels treatment specialists need to perform and meet when planning fuels treatments? Are we missing any specific tasks or broad objectives for fuels planning?
- felt that the IFT-DSS is on track for the broader objectives but then should focus on adding specifics and functionality (see written comments below).
- felt that what we had here is good but we need to add the historical perspective – especially regarding some of the management constraints and management with respect to climate change.
- discussed how right now, in his opinion, land managers do not have the tools or ability to identify change – mentioned that this might be outside the scope of the IFT-DSS;
    - however, discussed how one way to identify change may be by using the FRCC approach or some other fire regime-type approach that provides a broader ecological perspective.
    - also hopes that the IFT-DSS will help provide the ability to put fuels treatments into a broader historical and ecological context.
    - mentioned the National Fire Plan Operations and Reporting System (NFPORS) in context of the need to identify whether modifying the fuels is modifying the fire regime.
- felt that the proposed output looks good – this is the type of output that they base their decisions on.

2) Is the functionality as proposed in the IFT-DSS Proof of Concept (Section 3 of the Work Flow Report) useful? Could the POC system as it is described be used by fuels treatment specialists to plan fuels treatments and prescribed burns?
 - answered that he thought it was good.
- discussed that the prescribed fire planning will get the most use.
- thinks that fuels planners will use the strategic planning functionality pretty heavily, especially if it is clearly explained.
    - I asked if example data sets would be good, and he was very supportive of the idea.
- mentioned again in response to this question that the broad problem for fuels planning is usability and data access.

- having access to data will help how fuels planners and prescribed burn planners do business.
- data management and data accessibility is the key to success.
- also feels that for a lot of people, an understanding of the system and the models within the system will come with use.

General Comments (phone interview):

"In general, if you can improve the data acquisition and output capabilities, this (the IFT-DSS) will be useful." – "This puts a lot of tools in reach".

- with category X exclusions as used under the Healthy Forests Act going away, they are going to be doing more EAs (Environmental Assessments) – IFT-DSS could possibly help them with the EA process.

- mentioned that liability issues and contingency plans are an important concern when conducting prescribed burn and fuels treatment planning (see written comments below).

- discussed how having a basic and advanced user function is a good idea.

- discussed how FireFamilyPlus includes measures of accuracy and statistical applicability and suggested that the IFT-DSS project look at ways to assess the statistical accuracy of system outputs such as the FlamMap output.

- was wondering if we were including open source software and tools such as Google Earth – discussed how Google Earth has become a valuable tool for fire and fuels specialists.

- suggested that Farsite be incorporated into IFT-DSS as soon as possible, as in his opinion Farsite is a more powerful tool.
- Farsite more landscape-oriented.
- FlamMap better linked to specific locations.

- brought up Photoseries and Photopoints and mentioned we should think about how we could incorporate these as data sources into the IFT-DSS.

Likes the FCCS coding system (three number system) – feels that if this could become accepted and taught well that the numbering system could easily and concisely communicate information about fire potentials and potential fire effects.
- feels that in the long run, Consume and FCCS might be the way to quantify fuels, fire behavior, fire effects, and influences of fuels treatments on these variables.

Also discussed how in rangelands the seasonality of fuels was not quantified well by any system – when are these fuels available? The quantity of available fuels changes significantly from season to season. Data sources such as LANDFIRE and the FCCS do not capture that change in available fuels as fuels change seasonally.

Had some IT questions, such as, how are new tools implemented? What happens when you leave the network? What about people in remote locations who don't have access to the Internet?

Brought up Don Carlton's program Fuels Management Analyst (FMA) – mentioned that this might not necessarily be the program, as it is a commercial program that needs to be purchased, but liked the approach.
- mentioned that it can help figure out crown fire and crown fuels.
- nice tool for calculating fuels and crown fuel quantities.
- simple to use.

For risk assessment, he felt that the Finney approach is the correct path to take.

Written Comments: Received 08/07/09

The following comments/suggestion relate to Question 1:

Strategic planning work flow scenario

- Fire Regime—Current tool is FRCC. This should be considered in Strategic Planning. Land treatments are cumulative spatially, functionally over time and taken as a whole will change a fire event's outcome. Optimized treatment location can significantly alter a fire event outcome and ultimately a fire regime. We try to match treatments to a desired fire regime. Different fire regimes have different fire hazards. Fire is a normal process of ecological function. Altered fire regime has weight in decision making. Is there a need for a crosswalk tool to manage and assess cumulative effects of fuels treatments across the landscape: FRCC? Currently, Landfire FRCC tools are the best, in my opinion. Other FRCC software is far too time intensive.

- Please seriously consider Element 17 Contingency Plan in RX Plan:
. *Contingency Planning*
 Key Finding
 The ability to successfully manage the unexpected is dependent on having comprehensive contingency plans. Almost all of the people interviewed by the Information Collection Team expected that their burn would have a successful outcome. However, when their fire escaped, many felt that adequate contingency plans were not in place. Problems encountered in transitioning to a suppression organization can be mitigated through more complete planning and development of contingency plans prior to the prescribed fire's ignition. This includes knowing the suppression qualifications of burn personnel. (http://www.wildfirelessons.net/documents/Rx_Escapes_Report_110408.pdf, p. 5)

 IFT-DSS contains tools to help contingency planning.

- Also, Complexity analysis under the IA RX Guide is very subjective and cumbersome. Anything you can do to help streamline this will be very helpful. Sometimes I spend 20%-30% of my RX planning time just on complexity. Some people will simply create one and tweak it for each individual burn and no one reads it but as indicated in the above HRO findings it needs to be taken seriously because negative outcomes can be catastrophic. Line officers are signatories to the complexity analysis.

- Implementation, post treatment monitoring: Establish a pathway for updating layers based on implementation. Measuring success or failure—did we meet the objectives (S.M.A.R.T.)?

- Output: Check out NRCS Soil Web Mapper outputs. Building an RX plan within IFT-DSS would be awesome. I'm always spending time on formatting. Allow some customization because while we are held to the IA RX Guide each agency has specific additional requirements in addition to what's in the IA RX Guide. I have come across an interesting human factor recently working in data management and GIS. Some people are very visual (maps, graphs, etc.) and some are very numbers oriented (spreadsheets, tables, lists, etc.). I think a balance between the two will be helpful. Generally, the fire community is very visual.

- Record/data management and storage: ORWA BLM is centralizing IT systems. How will data be managed and stored from a web based system?

- Gaming or testing outcomes in strategic and RX planning: I often spend time setting up scenarios to test outcomes. If you can make this process more fluid than current apps this would be very helpful for time management. Continually dorking around with settings and inputs is a time eater. I tested ArcFuels. This app did a very good job bridging software and data allowing me to game out which sequence of treatments met objectives for a given stand. We often treat land with a sequence of treatments especially if fire hazard is very high. I was amazed at the different outcomes for the same sequence of treatments in different stands. Radio bars are good for gaming.

- Checks and Balances: Identify critical decision points and test them. If applicable, statistically test decision points (Type I and Type II errors) or provide the stats to make a determination.

- 2.7 Example Output- Allow for customization, multiple colors.

- A simple spreadsheet for the burn plan to capture cost?

- Provide simple raster statistical summaries (a lot of the spatial data is raster so this would save time importing into ArcGIS to do the same task).

- I would like to see a decision tree or something similar in strategic planning. This is the next step following the final work flow after risk as you have outlined in the POC. Inputs

for cost/benefit? Probably outside POC but consider potential IFT-DSS outputs that can be used.

- An interesting situation exists in modeling fire on the range: Fuels (loading, distribution, continuity, etc.) vary annually which means I have to pick from a set of fuel models or photoseries to accurately model fire for any given season.

- Are you incorporating photoseries in any way? Through FCCS?

- Risk can be a good way to paint the picture to a decision maker. The true value or weight of a "value-at-risk" is a functional part of their decision making which is comprised of input from their resource specialists, land management plans, and personal values. So the value of "value-at-risk" is very much dependent on the decision maker. In fire we often make black and white decisions. Line officers are often working in the gray. Consider partial sensitivity analysis. Understand that value at risk is a variable with infinite possibilities (and is subjective at times). Assume value-at-risk has some value, x. Risk will range from 0-100 (based on fire hazard/risk). The decision maker can then choose which level of risk is acceptable or unacceptable based on x. The trick is determining whether this is a linear relationship, binomial, or polynomial. I think it is a straight linear relationship but I haven't had a chance to run this by a statistician. Probability should guide choice. Value-at-risk =1-9 may also be an ok approach. Is it a big enough range? Test it. Decision trees are a good way to illustrate this problem. Given that range fuels vary constantly this approach will be tricky. Focus will probably have to be on worst case. **The problem is that 95-99% of the time the worst case is not true…** It will depend on the value at risk and the decision maker. Take a look at this paper if you are not already familiar with it, http://www.fs.fed.us/fire/rerap/Burned_area_risk_assessment.pdf it's based on a Poisson distribution. I think it would be easy enough to generate rasters from this. It's a good fit as long as there is good fire history. This might be something to consider in addition to what you have proposed.

- The risk assessment process is a good way to identify and focus land treatments in areas of critical concern (WUI).

The following written comments are to address question 2.

- Generally, it's on track. Yes, it can be used but always remember the technical skill levels of the fuels community run the gamut and not everyone will need all the bells and whistles. There is also a distinct difference between large scale planning and the day to day small scale implementation planning that we do. Having said this, a way to determine the cumulative effects of small scale treatments over time would help show broad scale effects, especially in terms of treatment optimization success or failure. We don't always get to choose the best place for a treatment due to compromises made in the planning process. IFT-DSS can help make the argument for always choosing the best treatment. I work on a district with over 5 million acres and our treatments currently

range from 20 acres to several thousand. I'm not sure if my district will ever be comfortable with 10,000 acre plus treatments done by other BLM districts.

- Treatment effectiveness over time will be very helpful. Most of us are in short of supply of monitoring and this will help in developing a maintenance schedule and focus monitoring efforts over the life span of a treatment.

- Until we have a rangeland equivalent of FSVEG, rangeland planners will be limited to Landfire and local data. Please understand range represents a huge land area with very significant and severe ecological problems that have lead to severe and catastrophic fire. I think the fire science community at large has come to realize this and is working on the problem. IFT-DSS has to be able to incorporate future tools for range.

- Be very cognizant of scale issues as they relate to planning. I am happy to say Landfire Rapid Refresh has really helped by increasing accuracy at a smaller scale. Otherwise we are limited to local data and that varies significantly in quantity and quality. There are a lot less foresters, silviculturalists, and range specialists than there used to be. We have become heavily reliant on remote sensing and GIS and in some cases monitoring and updates to land data are non-existent or are slow in coming.

- FOFEM vs. FCCS/Consume: I found FOFEM to model more accurately (statistical test) based on NPS FMH plot data (FEAT). I believe this is because FCCS uses the fuel bed approach and is very comprehensive (considers everything that is burnable) while FOFEM and NPS FMH plots follow traditional methodology. As far as IFT-DSS is concerned I think allowing the user options is the best approach. I usually run both and compare outputs to find the best fit.

- Note: I often have to use Farsite in conjunction with Flammap. Farsite, in some sense, has more capabilities and is more powerful than Flammap, in my opinion. Flammap is useful in fuels treatment planning.

- Link to KCFast/NFMID for weather?

- 3-7 POC Flow Chart: Step 6-7 and NEXUS do not fit rangeland. I think the 6-7 feedback loop is an important step and needs to be developed for range. At this time I would manipulate Landfire raster data in a bastardize attempt to replicate this process. In general, take out anything about forests, crownfire, etc. and see what's left. Does it flow or make sense? Does it meet your overall goals? How forest-centric is this? Is this really only for forestland? Can this be used by agencies across the US where timber is second fiddle? I think so but consider the shortcomings and identify where we can plug in other models that can address other concerns beyond timber at some future date. This will vastly increase functionality over time and make the investment in IFT-DSS more worthwhile.

Interview notes: (Combination of interview and written communication (e-mail). Interview responses come first; written responses are presented at the end of this document. Note that both sections provide important insights.)

Fire Ecologist
Interior Alaska Region
August 13, 2009

-Proficient with a wide range of fire behavior and fire effects models. Proficient with ArcGis.

Responses to the questions: (Note that some of the concepts in these responses are discussed in the written comments more completely.)

1) Do the work flow scenarios described in the IFT-DSS Work Flow Report cover the range of tasks and objectives that fuels treatment specialists need to perform and meet when planning fuels treatments? Are we missing any specific tasks or broad objectives for fuels planning?
    - Process as it is laid out is pretty good.
    - "I think it will be a great product" – if nothing else it will standardize the fuels treatment process – also make people look at the long term influences of fuels treatments on the landscape and maybe help people get a handle on some of the economics of fuels treatments, good and bad; however, but some of the underlying details are not there yet.

2) Is the functionality as proposed in the IFT-DSS Proof of Concept (Section 3 of the Work Flow Report) useful? Could the POC system as it is described be used by fuels treatment specialists to plan fuels treatments and prescribed burns?
    - yes, as long as it takes point data.
    - expressed some concern that LANDFIRE data might not be at the proper scale for prescribed burning – was happy to confirm that points or stand level data entry would be supported and that editing the LANDFIRE data would be possible "flexibility is good".
        - as an aside, mentioned that he liked the LANDFIRE data editing tool in WFDSS; said that it was easy to use and worked well.

Written comments (email):

Hi Stacy. My comments on IFT-DSS.

You might better clarify the audience. In my mind there are two types of hazard fuel treatments:
1. The southwest where the problem fuels are on the surface on in the ladder fuels (ponderosa, dry douglas-fir). These projects are biased toward reducing the surface fuels and preventing them from getting into the canopy. Weather is always available, fuels are not.
2. Long fire cycle ecosystems where the problem is canopy fuels (spruce-fir, black spruce, lodgepole pine). Fuels are not limiting, weather is. Planning is weighted toward dropping a crown fire out of the canopy. These two types are major divisions in how the user is going to use IFT-DSS. My experience is with long fire-cycle ecosystems so my comments are probably biased that way.

For canopy fuel treatments I wonder if a crown fire model like CFIS could be incorporated? The fuel manager wants to balance retention of trees against the threshold of canopy fuel that will carry a crown fire. Canopy base height, canopy bulk density, etc are needed. CFIS is an empirical based crown fire model designed for boreal forests and would be good for Alaska and Canada. It seems to over-predict for L48 forests. I've always thought that Rothermel's crown fire model is wonky and only correct by accident but it seems to predict crown fire better for L48 forests. My hope is that an empirical-based crown fire model will be developed for L48.

Both of these models would be useful inclusions for the "long fire cycle/crown fire" user. For canopy fuels I have used the Crown Mass module of the Fuels Management Analyst Suite and recommend their algorithm for calculating canopy bulk density. Crown Mass uses the many equations in the literature for the many tree species to calculate basic canopy layer fuel attributes. I've found that the FVS method is not that good (it calculates canopy bulk density as canopy fuel load/canopy depth which is simplistic.

If you want more clarification on this I can provide it or else you can look in the attachment which is an excerpt of a manuscript I wrote a few years back (but which was rejected). IFT-DSS could provide the user a choice between FVS and Crown Mass.

Along those lines the canopy fuel manager should be aware of the problems of opening up the canopy to increased sunshine and wind which dry fuels faster and promote live herbaceous fuels over litter. I don't know of any models or data on this problem, except in black spruce. Some unpublished documents exist here http://afshome/afs/organization/mgmtplan/effects.php and you might look at this too http://afshome/content/effects/tfmproject.pdf.

A side note here on Alaska. Permafrost throws a significant loop in any fuel management process. Opening up a canopy allows the ground to warm up and permafrost to melt with the associated risk of thermal soil degradation. I have no hard recommendation here as yet. We have some data from fuel treatment project demonstration sites but few data are available from these ongoing projects. It might deserve an asterisk or "use at your own risk" statement in IFT-DSS at this time. Facilitation of bluejoint and arctogrostis in fuel treatment areas is another problem we are working on. Excessive ground disturbance may switch succession to a grass dominated fuel type.

There may be a third type of audience to IFT-DSS as well: the resource manager seeking to burn or treat fuels for resource benefit, improve habitat etc. IFT-DSS only peripherally addresses this user?

I am interested in seeing how IFT-DSS interacts with FVS. An export-import procedure will make it difficult for the average fuel manager to use. I took a class in FVS years ago and haven't used it since. If I were to try to pick it up again it would take some ramp-up to get it to work. That is a pervasive problem with fire management software; many programs that don't easily interact and using the different softwares so infrequently that a lot of time and energy is wasted "re-learning" how to do things.

Overcoming the export-import problem will go a long way in making IFT-DSS a user-friendly product. By analogy a successful example is FSPRO which readily extracts weather and fuels data from on-line sources, obviating the user's need for going through the intermediates of KCFAST, LANDFIRE, FIREFAMILY, ARCGIS etc.

I definitely approve of the inclusion of FVS stand visualizer. When I was in Yellowstone it solved a major problem: demonstrating to landscape architects what the final product would look like. The LAs want to use trees and shrubs to hide infrastructure, buildings, power boxes, parking lots, etc. At the same time the fuel managers want to get rid of all these hazardous fuels. They want to zip the trees up to 6' to bring up the canopy base height but that allows park visitors to see infrastructure. Aesthetics can be a huge deal and visualizing the final product can go a long way toward planning.

FCCS is a good inclusion also. I like the ability to customize the fuel type.

I am a little unclear on how LANDFIRE data can be used at the scale of a fuel treatment project. Scale will be an issue. Some fuel treatment areas are small relative to the 30 m scale of Landfire data. It seems to me that Landfire could be used at scales of 1,000 acres or more but would be a poor choice for small projects. For small projects stand inventories are very useful but costly and a rare case to possess. FIA data? Where empirical plots are not available the Ottmar and Vihnanek fuel appraisal photoseries might offer substitutes.

I understand that the long-term plan is to place FLAMMAP and FARSITE with FSPRO as an online resource under one roof. Is it the plan for IFT-DSS? We particularly like web-based tools at the BLM because the trend in computer support is to take away more and more user rights. Anything that obviates local software installation, adjustment, and maintenance is welcome. I also really like the idea of having fuels and weather data stored and maintained online by a dedicated program. Local copies of fuel maps and weather files become "stale" quickly.

I also like the idea of having a cost-benefit module. This is something that I am currently using to evaluate the cost of prescribed fire on military lands in Alaska versus the benefit. This science seems fairly nascent at this point but is getting better. This is also useful to argue for or against a fuel treatment if you can say over the next 50 years you will spend X implementing and maintaining a fuel treatment versus spending Y in damages, injury or replacing infrastructure. I agree that this is wonky when it comes to fire-use for resource benefit when it is difficult to quantify resource benefit in terms of dollars. Hopefully the fire economists can get a grip on it.

Hopefully this helps you out. Let me know if you want to discuss or need clarification.