DTIM 9.0 Webinar [webinar held on 07/17/18]

>> My name is Randy Morin and I am a Research Forester at the Northern Research Station and I am going to be showing a demonstration of the Design Tool for Inventory and Monitoring. This is a tool that is being developed by the National Inventory and Monitoring Application Center for the past, I don't know how many years it's been now, for a while. This is the design tool portion of the overall inventory and monitoring tool that we refer to as DATIM. And the design tool piece really rose out of the idea that we should be asking our questions first and collecting our data later. In other words, beginning with the end in mind when we start thinking about designing an inventory or when we start planning for monitoring.

>> So just a brief overview, I will talk quickly about the DATIM tool and what it is. Then I will get into the design tool portion of DATIM and talk about the different modules that have been developed and then do a little bit of a demo of the DTIM tool itself and some of the functions and features that it has. And then I will just go over an example where I use some monitoring questions from the Wayne National Forest Monitoring and Evaluation Plan and the kind of report that DTIM can produce.

>> So I will start off by just talking about DATIM. And let's see if I can go to that webpage so you guys can see it while I am talking about it. The DATIM stands for the Design and Analysis Tool for Inventory and Monitoring. It's a sweep of software tools. It was originally designed to provide some national consistency for designing monitoring plans and conducting data analyses. One of the main customers for this was and is the National Forest System. We have also worked with clients that wanted to install inventory programs on their state lands. For example a couple of states, Wisconsin and Indiana, come to mind as a couple states who have worked with us to install FIA-like inventory on their state owned lands. So this type of tool can help someone decide what types of data need to be collected in order to answer the questions that they want to be able to answer. And then there is a part of the tool that can help with sample size as well.

>> So there is the two primary tools within the DATIM tool itself, are the Analysis tool and the Design tool. And so we are going to be focusing on the Design tool today.

>> So once you've logged in and clicked on Design tool then you will come to this first screen of the Design tool, the Welcome screen. Essentially this tool was designed to act as an expert system to help managers determine potential monitoring questions that are associated with their management objectives and also to help determine which questions might be able to be answered with any existing data that they might have. A lot of this is focused on the FIA database, the FIA's plot network. But if you have data from any type of sampling system you could actually input it into this tool and you will see that part of it when we get towards the last part of going through the demo itself.

>> So when I said expert system, we originally had a panel of experts come together and we were focusing on forest health at that time but we had come up with a list of objectives, the monitoring questions that people might ask that are related to those different objectives and then the metrics that may need to be measured in the field in order to answer the questions. And so

when we say expert system what we mean is that as you go through and choose objectives then there are pre-selected questions that go along with each objective that is a suggestion what one might want to be asking with that particular objective and following that, there's metrics that are pre-selected as going along with the questions that you might select. The tool will also allow you to select any question or any metric for any of the objectives or questions, and also add new ones as needed.

>> And then finally, we have recently added the ability to share the projects that you've saved with other groups and other users. And then there's the reporting function that I will show you here at the end.

>> So we'll start off you come here to the DTIM page, it gives you a welcome page and we have a wizard that you can work your way through. I'll try not to go too fast in case there's a screen loading time lag here.

>> So we'll start the wizard and we can start off by talking about these base templates, or we can think of them as modules, we're calling them templates here. The main one that I'll be using for our demo today is the one that is highlighted, Forest Inventory Analysis Intensification. As I mentioned one of the impetus for starting this tool was to help National Forests potentially use this tool for monitoring plans and also potentially use FIA data in their monitoring. And so this FIA Intensification has a lot of questions and metrics that are already related to things that are in the FIA data. And at the end you can use the existing FIA data and look at the precision that you are getting around the estimate that you are interested in and you can play with the sample size, the confidence intervals and the level of confidence that you want to have in your estimate and it will tell you how many plots you will need to achieve that.

>> Some of the other modules that we have in here is one based on the 2012 Planning Rule, one based on the National Forest System Monitoring and Evaluation Framework. We just took those documents and pulled a lot of the objectives, questions, and metrics that were in there into this system. So I'll just go through and show you basically how you use this tool.

>> So to start off I'm going to pick this FIA intensification template and then you can either click objectives here, sort of like a next button, or you can click it over here on these numbers.

>> So if we get to objectives, some of the objectives we have available built into this module are ecosystem restoration, forest fire effects, there's a list of them up here. I've already pre-chosen forest health and biological diversity, you can either drag and drop these things or you can double click them in order to move them down to your selected. If there's something in here that is not already in the template you can actually add your own by creating a new objective. It will then be added to your selection for this particular project but then it will also become an available objective for future sessions that you have within the DTIM tool. We have two objectives selected and we are going to move onto questions.

>> So for each objective that you have selected, you can click through them here with previous and next, you have to select at least one question to go along with each objective that you have. So for this objective of forest health, first of all, as I was mentioning this expert system idea. We

start off by getting a list of relevant questions. The panel that came up with all this material, we came up with a list of questions that are most relevant to forest health as an objective, and there is another set of questions that are somewhat relevant. So you can scroll through all those and see if there's anything there that is of interest for what you're monitoring for. And then if you wanted to see all the questions that are currently available in the system you can actually click this show least relevant button and then you'll get a much longer list of questions that are available to choose from. But we're going to move forward with this one question just for the demonstration purposes.

>> We'll move onto our next objective which is biological diversity. We've added another question here, what exotic species are present? Are exotic plant species increasing in abundance? Again we can look though this list and choose from the relevant questions or we can go down into the longer list.

>> So we would then move onto the next step which is choosing metrics for these questions. Again, we have the same menu where we can move between the questions here with previous and next. And you have to choose at least one metric for each question in order to move onto the next step. I'm sure this is probably confusing to folks that have never seen this before.

>> There are two different ways that you can add a metric, the DTIM metrics are all the metrics that we had originally linked with the questions. Again for each question, if you pull the drop down list down, you'll see the most relevant are these two mortality and net gross, are the two most relevant to forest health. And then there were the somewhat relevant questions that have more choices for mortality and net growth. Again you can hit show least and then you can pull up the entire list of all the metrics that are in here.

>> And then you'll see this box on the right, which is ATIM compatible metrics. This a slightly newer feature for those of you who have maybe seen this DTIM tool before. ATIM compatible metrics are essentially the metrics that we have data for in the FIA database. If you pick your metrics from this side then you can potentially grab data to fill in for the next couple steps straight from this tool. Using the DTIM metrics even if you are doing something where you don't have any data, you can actually use this tool just to organize your monitoring plan by coming up with your objectives, and your associated questions, and then what data you are going to collect for each of those. And then you could use this tool just to generate a report as a way to organize that monitoring plan. The next level then is actually using existing data to look at the precision around your estimate and then playing with this precision tool in order to help you decide on your sample sizes.

>> In order to show that, I was going to pick an ATIM metric just so that I can show that next piece. In this case we're talking about forest health, we're talking about growth and mortality rate so I have chosen as my metric, and these variable names are not super helpful for people who are not FIA familiar, but just for an example I will show you that I chose this one, which is annual cubic feet of tree mortality on forest land, I have chosen that one. This is essentially designing a table of outputs with rows and columns, so for rows I have picked tree species, and

for columns I have picked diameter classes-5 inch classes. And then I hit the add button to get that metric added down here below. And we'll move on to the other question.

>> We've got to pick at least one metric to go along with this question as well to move on. So for biological diversity, what exotic species are present? I'm just going to use a DTIM metric this time to show you how that would work. So let's say we wanted to do the number of seedlings and saplings so that we could take a look at whether, for example, if the presence of exotic species was impacting trends and number of tree seedlings. So then we would want to look at, again something like tree species code or species group as the row. And something like maybe patch size for a metric. We can add that and it gets added down here so now that we've got a metric associated with each one of our questions we can move onto our next step which will be output tables.

>> So now it's showing us what our output tables are, our objective, our question and our metric for each one of those. And to go onto the next step we would want to look at the precision here. And in this case I picked variables that we don't necessarily have data available right now and so I am going to uncheck that one and we're just going to have one in this precision step for now.

>> So we'll move on and I've already filled this in so that I can show you guys how this works but essentially once you're here you still have these next and previous just like in the previous steps where you would go through your different monitoring questions, but in this case we've only chosen one so we can't select.

>> Again here is our question, what are the growth and mortality rates? And I was going to show an example of, let's say for whatever reason you're interested in the amount of mortality in American beech trees over 25 inches. I've picked Ohio as an example and I pulled out an estimate, I guess I'm going to try it, it did work pretty fast before. So for select analysis I'm going to pick my land base as forest land then I'm going to select the state as Ohio, and I'm going to pick 2010-2015 as the years. And then I'm going to do retrieve estimation attribute. We had already chosen that we wanted a table of species code as our row, mortality as our metric, and diameter class as the column. So once this runs it's going to give us the output of that. We can now scroll down here and look at all the species in Ohio. It tells us the total number of plots, the sampling error and we scroll down here to American beech and we want diameter of greater than 25 inches. If we hit select then it will fill in the numbers for us. I must have hit the wrong button, white ash, well anyway it doesn't really matter this is just an example.

>> So it fills in the estimate, the sampling error, and the number of current samples. FIA's estimates are, the sampling errors are based on a confidence level of 68% and if we have our confidence interval half-width at 10% then we know that we have a 68% confidence in our estimate of 6.2 million cubic feet of mortality of white ash and then we have a 68% confidence and a 10% confidence interval around this estimate. And that's with our current sample size of 4,100 plots. Well if we thought, well we don't need to have 10% confidence intervals, we can deal with having 25% confidence intervals. We would see the sample size recommended is currently 104,000, it should go down quite a bit, it goes down to 16,000. And so you can play with any of these numbers up here on the top, and the bottom numbers will then all update. So if

you have an estimate that has a much lower sampling error, say 5%, then your sample size needed is obviously going to go way down. So if our sampling error is that low for this particular estimate our sample size needed goes all the way down to 165.

>> So we've been trying to demo this tool and show it to folks. I know some of the forests are going into plan revision, one of them being the Wayne National Forest in Ohio. So I went through the Wayne National Forest 2012 update to their monitoring plan and pulled out a bunch of questions from that plan that were at least potentially things that FIA would have data for to come up with an example.

>> So I'm going to click over to my Wayne National Forest project that I've already developed. Now if we go back to the beginning here, you'll see I've got the FIA Intensification selected as the template.

>> I selected 5 different objectives based on some of the monitoring questions that were in their plan.

>> I picked questions to go along with each of these. In the end I came up with 13 questions.

>> We can look at the output tables here and see all 13 questions and then some of them I've included in the precision.

>> If we go onto that one we can go through and look at each of these questions. We've got estimates and sampling errors and the current sample size. For this example the question was, how are management activities providing a variety of structural classes? So I went and did an estimate of small diameter stands so we could see how much early successional forest is on the Wayne. We came up with an estimate of roughly 18,000 acres and that came from the 138 plots. And so if we, based on the sampling error which is really high at 43%, in order to have a 10% confidence interval around that 68% confidence level we're actually going to need a lot more plots, 2,600 plots in order to get this type of precision around the estimate for small diameter stands. But we can go through and look at some of the other questions that I have in here.

>> So here's an example, if we were interested in large diameter stands, because the majority of the forest is made up of large diameter stands, there is a lot less variance in that estimate. We have, for large diameter stands we have an estimate of 212,000 acres with sampling error of only 7.5%, so in order to get to this precision level we would have only needed 77 plots and we have 138.

>> So you can then come in here and if some of these questions are more important than others you can reorder them by pushing the up arrow here to move one of them to the top. And then the final step here to show you is the View Report. I'm going to click it and hope it works, but if it doesn't I have it preloaded. So let's see if it really takes minute or two. Oh it really didn't take long.

>> Okay, so when you come to the report page, this would be somewhat analogous to the questions that are listed in the National Forest Monitoring Plan, I think it was Chapter 9 I think it was or maybe it was Chapter 4 in the Wayne's monitoring plan there was a chapter based on

their monitoring and evaluation plans and so it was somewhat organized like this where there was a bunch of questions organized under different types of objectives. And so when you come to this page there's multiple ways of viewing this report, this is sort of the broadest view or we can look at the objectives. We can click beneath them to see what the questions are and what the metrics are associated with those questions.

>> We can look at output tables to get a different view and that way we can see the objectives, questions and metrics all together along with the name of the table that outlines what data we are looking at in order to answer that question. You can then filter and sort by any of these, if you just want to look at your forest health question, you can filter it that way and just look at those.

>> And there's a master tab that has everything on it.

>> And then I think the most useful or interesting is to go to this precision tab and then for each one of these questions you're getting all the statistical information that we were looking at within the tool itself. And you can go for each one of these you can look at it or you can show them all as a table. And I think this is where the rubber kind of meets the road, if you know, for this example you know you have138 plots roughly on the National Forest and you know that these are some of the types of data needs that you have and then over here in this column the tool is telling you how many plots you need to establish the type of precision that you had input into the tool. So we've got a couple questions where the data that we need, things like we have an adequate sample size, we've got 77 plots needed for the 138 that we have. Another one down here where we had 109 plots needed. But then we've got multiple questions in here where we would need a whole lot more plots in order to provide the data at the precision level that we had specified in the tool.

>> That was it for the demo that I have. Let me see if I had any other things that I wanted to show here. There's a couple other features that the tool has that would be potentially more for an admin user. If a forest developed a plan, or used this tool in order to develop a plan for monitoring a specific topic, say the Alleghany National Forest had developed a plan for monitoring the Indiana bat and then the Wayne wanted to establish a similar monitoring program for the Indiana bat then the project created in this tool could then be shared with another user on a different forest. Then they would have a place to start with developing a monitoring plan.

>> There is also a way to, these base templates, say if a region or forest had developed a project within this tool that was going to be used over and over again on an annual basis or something like that, you could actually save that project as a template that anyone could come in here and use, essentially as a starting point.

>> And I would like to open it up for questions or discussions if possible, we're looking for feedback and looking for guinea pigs to start trying to use this tool for people developing monitoring plan, particularly in a National Forest System.

>> Okay, nobody has any questions?

>> Randy, some people are typing in the chat box, so you might have some questions popping up there in a minute.

>> Okay, how do I get back to that?

>> I have a question from Nessa about what kind of support do we have? Well, we have people who are willing to work with you on a one on one basis to try to help you with the tool, and there are trainings available also.

>> Valerie Foster is asking about other sampling schemes non-FIA, anything that comes from a plot-based sample that you have an estimate and a sampling error and a sample size, you would be able to use that precision part of the tool for. I know that we have an ongoing effort also to incorporate FSVEG data into these DATIM tools as well. There might be other people on the phone who can answer that question better than me.

>> Let's see, Zachary is asking if you will have access to this if you're not in NFS? I think there is a way to do that. Liz says the tool's available to the public and there's a way to create an account so that you can save your work.

>> Thank you, Mary, for putting that link up to the RIG DATIM page in the note.

>> Thank you.

>> This is Patrice, I have a question. A few years ago the NIMAC team was using DATIM, I think to help either region 8 or 9 or some combination there, do you know anything about that project and can you describe the objectives and what sort of support you guys were able to give the regions?

>> I'm not sure if we have the right people on the line to answer that question.

>> This is Charlene. Patrice, which project are we referring to?

>> It seemed to me there was a time when regions 8 and 9 had been working heavily with an analyst at NIMAC to be able to use this. But I only caught little drips of what that project might have been about, so I just wasn't sure if I was recalling it correctly or whether or not you guys actually had multiple projects.

>> We have multiple projects. I think one interesting aspect of this, and this is Charlene Breeden in Region 9, is there are folks in the past, Mike Schanta and David Merriweather, that actually travelled from forest to forest in Region 8 and Region 9 and they ran this type of program before it was on this platform and this far along in development with the forest to figure out whether they should have 2X intensification or 3X intensification. I think by the similar concept of looking at errors and how many plots it would take to answer the question that they have, or questions. So that is where I see the parallel to what Region 8 and Region 9 did in the past was when we were setting up intensification, you might want to use this type of approach to figure out what error you can live with and what questions you want to answer. And since then we have hired an analyst to help bridge the gap between needing products, analysis product, and then getting to DATIM eventually where we are more self-sufficient to do this work on this platform. Does that answer it? And there is a series of analysts.

>> Great, thanks.

>> Thanks Charlene.

>> Sure. Thank you for all your work on the Wayne.

>> No problem, and I just have thrown it in there as an example, so I would like to kind of follow along with the Wayne as they're progressing through their plan revision and see how we might be able to try to use these tools to help out if possible.

>> Yeah, we'll do that, we'll definitely keep doing that.

>> Heidi Cunnic, is asking if they have a question that is not listed how do they go about knowing if the data exists? That is a good question. You could look through the type of data that is available from FIA and see if it seems there's potential there, otherwise you would probably want to ask somebody who either works for FIA or works on DATIM. Oh, it looks like Liz already answered that one for me, thanks Liz.

>> Now the other way of looking at that, this is Patrice, is coordination that could be done between you guys and the EMC staff because the Ecosystem Management Coordination staff in Washington is trying to work with the Resource Inventory Monitoring coordinators in the regions to identify common data sets that are frequently needed or requested for monitoring. And that is a project that will probably going to be ongoing through fiscal year 2019 and 2020 but that would be an interesting opportunity to compare what our forests are saying they need for their monitoring with what could conceivably be hooked up with the DATIM project.

>> That's good to know, thank you. And good to hear from you again Patrice.

>> Yeah, thank you. So I would definitely say it would be great for you or Liz, or the appropriate people there on the DATIM team to stay connected with Priya Shahani and Debbie McLaughlin because they will be making progress with that project with the AMC planning staff. And that's probably one reason why Valerie is on the line, because Valerie Stein Foster works with those folks too.

>> Okay, well thanks everybody for listening in and viewing our demo today. Is there any other questions or discussion points? Or anything I went over too quickly and could go back to?

>> Okay, well hearing none, I guess we will end the call and thanks everybody for calling in.