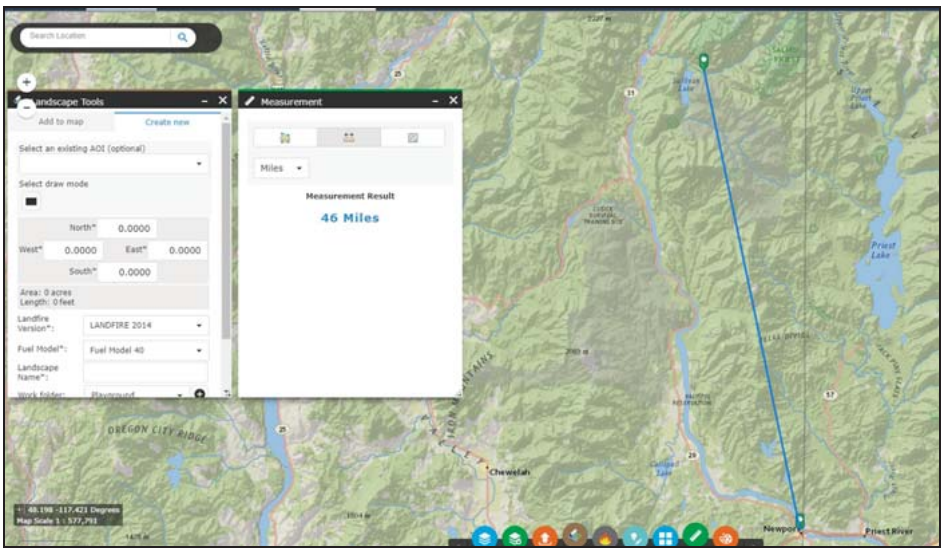
Developing Treatment Alternatives - Colville National Forest Example

Management Scenario

You are a Fuels Planner on the Colville National Forest, about 47 miles northeast of Spokane, WA. In this scenario, you will use IFTDSS to plan hazardous fuels reduction projects within three main watersheds within a proposed Collaborative Forest Landscape Restoration Program (CFLRP) project area.



The new Colville National Forest Plan has just been released and includes some new direction that allows certain fuels reduction treatments within Inventoried Road-less Areas (IRAs) and the use of wildfire for re-source benefit in certain cir-cumstances. Based on the new Forest Plan Direction, you see a need for some sort of fuels reduction treatments in the Sullivan, Slate, and Salmo Watersheds of the northeastern portion of the proposed CFLRP project area.

Based on Forest Plan direction and the CFLRP proposal guidelines, our objectives are to:

- Recommend hazardous fuels treatments that can occur through this project to: Reduce the risk of uncharacteristic wildfire and/or re-establish or maintain low-severity fire regimes; reduce surface fuel loading and the overall horizontal and vertical fuel bed con-tinuity to reduce the fire hazard to adjacent private, Tribal, and State land; and return

low intensity fire to fire adapted vegetation communities.

- Locate areas where our actions will be most effective
- Evaluate what type of treatment will help achieve these objectives
- Describe why the treatment acres were chosen. Why here? Why now? What risk assessment did you use to identify these areas, e.g. wildfire hazard potential map or regional risk assessment, forest-wide risk assessment, etc.
- Demonstrate the need for treatment, both quantitatively and spatially, to members of your district interdisciplinary (ID) team.

You will use IFTDSS to plan a treatment around these objectives.

Sullivan Lake. Photo courtesy of Daniel Brown, USFS, Colville National Forest.

Section 1- Previewing and Creating a Landscape using Map Studio

Previewing the Landscape

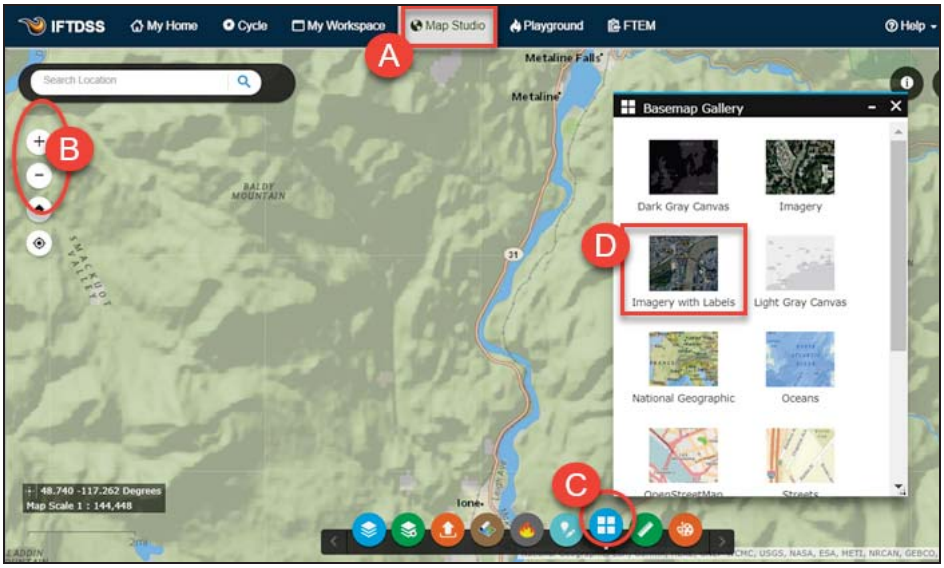
The first step takes place in **Map Studio** to get a good look at the area and create a landscape to start working from. To do this:

A. Access **Map Studio** from the top navigation panel, visible on any page in IFTDSS.

B. Use the **Zoom** widgets, and mouse, to locate your area. The location search box at the top of Map Studio can also be helpful.

C. Open the **Basemap Gallery** to choose a more detailed base layer.

D. Select “Imagery with Labels”.



Create the Landscape

The landscape serves as a starting point for the rest of the analysis. To create a landscape:

A. Click on the **Landscape Tools** widget at the bottom of the screen.

B. Select the **Create New** tab to create a new landscape.

C. Select **Draw Mode**, then drag across the area you’d like to analyze. For this example, you can follow along by inputting the coordinates below directly into the fields:

- East: -117.0336
- West: -117.3879

- North: 48.9928
- South: 48.4692

D. Select the version of LANDFIRE data you're using, in this case 2014.

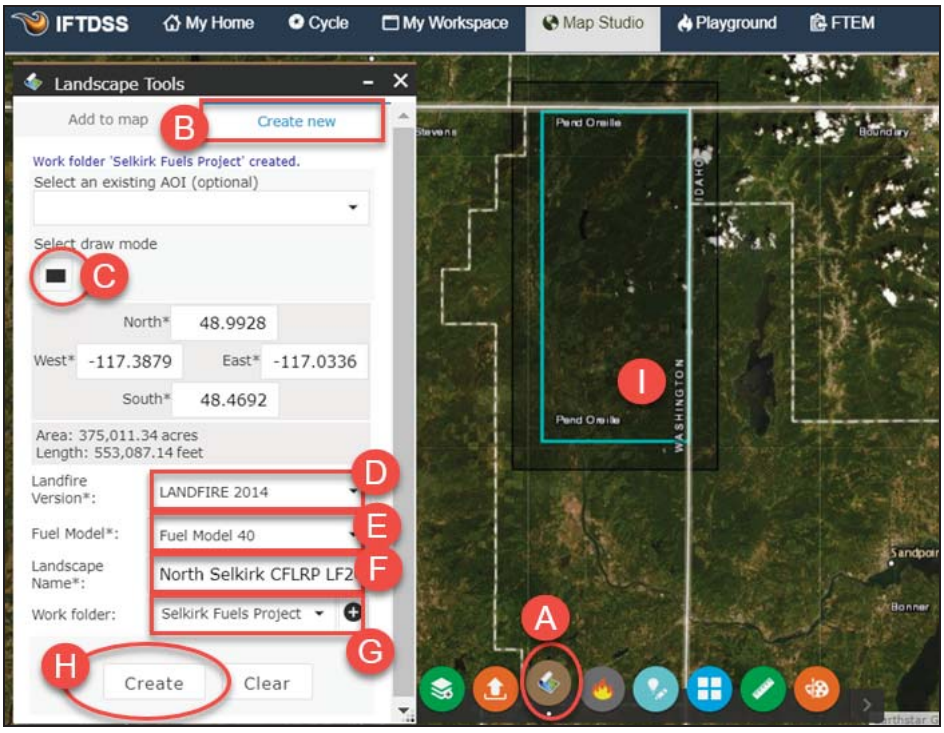
E. Select the fire behavior fuel model type (13 or 40), here Fuel Model 40 was chosen.

F. Name the new landscape "North Selkirk CFLRP LF2014 Un". Include the name, LANDFIRE version, and it's editing/treatment status. This makes it easy to discern this landscape from others once you start editing.

> Try to keep the entire name around 30 characters long to ensure it runs smoothly in future IFTDSS operations.

G. Choose or create a new folder for this landscape, this is where the landscape is stored in **My Workspace**. For this example, use the + button next to the folder name to add a new folder. Name it "Selkirk Fuels Project".

H. Once everything looks good, click **Create** and wait for the landscape to process.

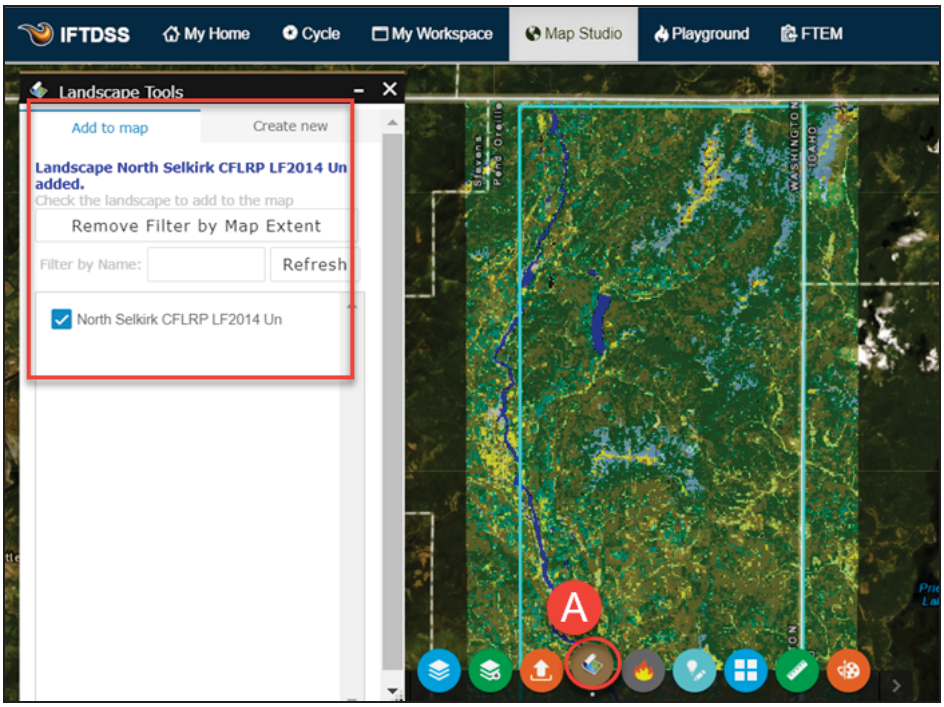


Section 2- Summarize and Assess the Land-scape

Displaying and Assessing the Landscape

Start assessing the landscape in Map Studio:

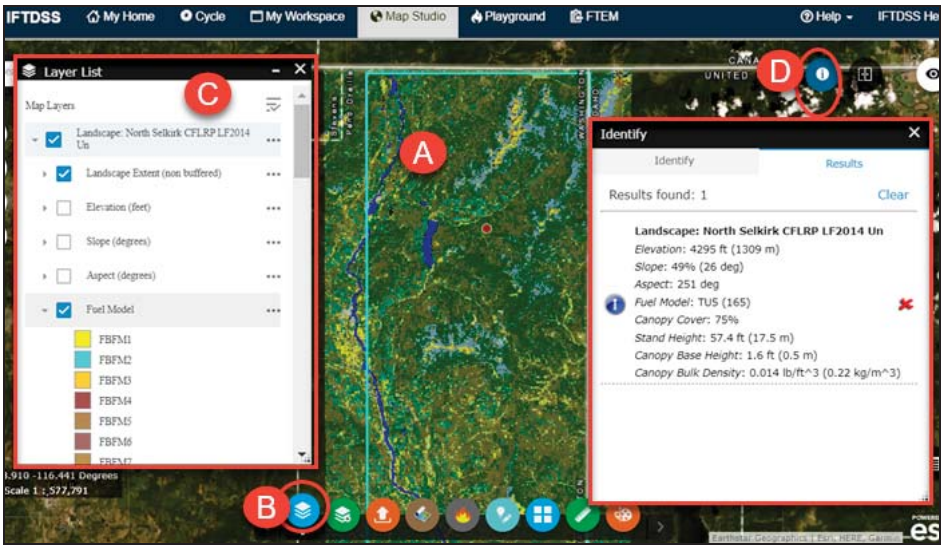
A. Use the **Landscape Tools** widget to check the landscape under the “Add to Map” tab. This adds the land-scape to the map and the map’s **Layer List** .



B. Open the **Layer List** widget, ensure your landscape is checked, and view the land-scape layers by clicking the drop-down arrow to the left of the check-box. You can check and uncheck the landscape layers to view. You’ll want to look at the fuel models to make sure they correspond to what you’re seeing on the ground in this area, so ensure the box is checked.

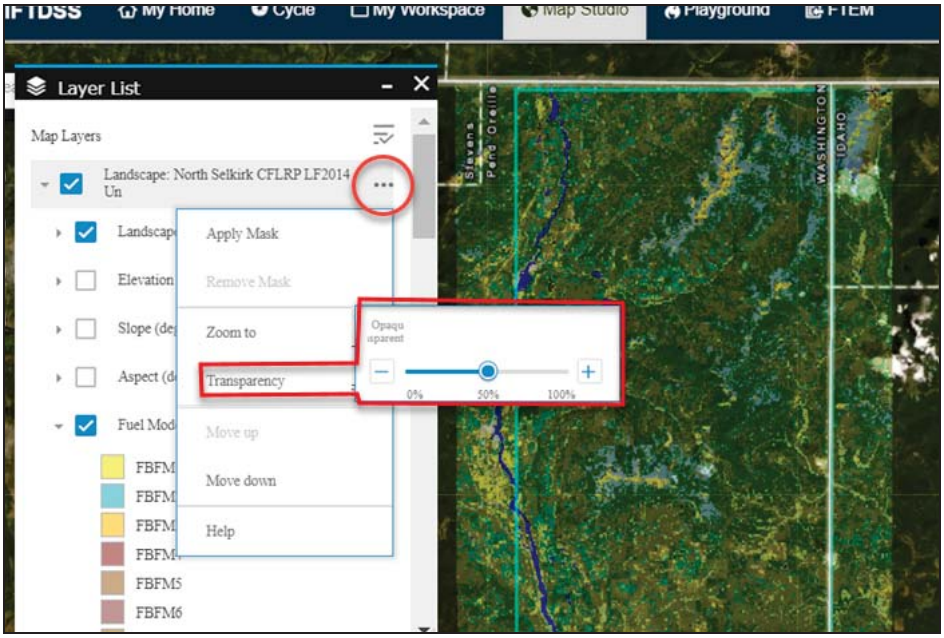
C. View the legend for each layer by clicking the drop-down arrow to the left of the check-box for that layer. In this case, check the box next to “Fuel Models”, then click on the arrow to the left of the checkbox to drop-down to the Fuel Model layer legend.

D. Click the **Identify** widget in the upper right corner of the page to view more information for each pixel. Select the layer to view (North Selkirk CFLRP LF2014 Un), then click on the landscape in an area you’d like to know more about. The Identify dialogue populates with the landscape information for this pixel. For example, by clicking you can see that the dark green pixels on the map correspond to areas of Fuel Model 165 (TU5). Continue examining various areas of interest on the landscape to learn more about what fuel-models are present and where. Notice that all of the landscape characteristics come up in the identify box when you click on the landscape with the **Identify** widget, not just the characteristic you specified in your Layer List.



Adjust Transparency

It may be helpful to adjust the transparency of the layer to better see roads, landscape characteristics, and other map features. To do this, click**More Options** ⊡ to the right of the Landscape name in **Layer List** . A drop-down menu of options opens. Choose **Transparency**, which opens a slider bar allowing you to adjust the transparency level for that layer. Once satisfied with the level of transparency, close the slider bar by clicking the **More Options** ⊡ button.



Adding Reference Layers

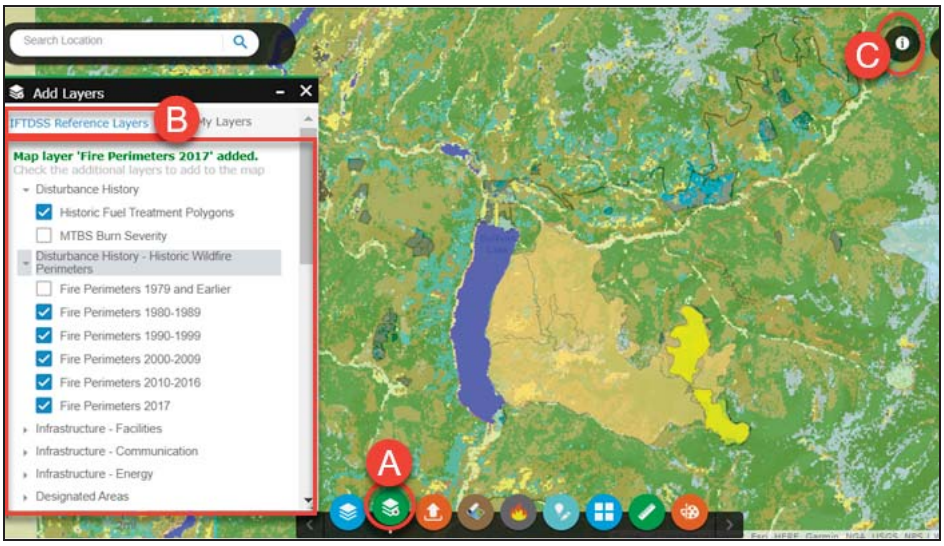
Before doing a full assessment of the landscape characteristics, you'll want to view previous fires that may have occurred in this area:

A. Click the Add Layers widget at the bottom of the screen and make sure the "IFTDSS Reference Layers" tab is selected. You'll notice there are many options for additional data layers, including "Ownership" and "Critical Habitat Areas".

B. For now, focus on disturbance history. Click the drop-down arrow next to "Disturbance History" and use the checkbox to select "Historic Fuel Treatment Polygons". Next, expand the drop-down for "Disturbance History-Historic Wildfire Perimeters", and select the perimeters for years 1980-1989, 1990-1999, 2000-2009, 2010-2016, and 2017. These appear in the **Layer List** and on the map.

C. Use the Identify widget to identify the exact year of the Kaniksu Complex, Noisy Creek Fire, and North Fork Hughes Fire. Click the applicable Fire Perimeter layers on and off to compare the landscape and fuel models under-

neath. In this example, you see they are reflective of these fires.



Follow this same process with the Historic Fuel Treatment Polygons layer as well.

After doing an assessment of all the landscape characteristics (Elevation, Slope, Aspect, Canopy Cover, Stand Height, Canopy Base Height and Canopy Bulk Density) you determine that the LANDFIRE 2014 data in this landscape reflects existing conditions, including previous fires. If there had been a more recent disturbance since this 2014 data was produced, such as a fire or fuels treatment that you would want to represent on this landscape, it could be easily represented by creating a polygon using the **Create/Edit Shapes** widget to reflect the disturbance area, then using the Landscape Editing task in the planning cycle to make changes to that area and save them. More information on Landscape Editing.

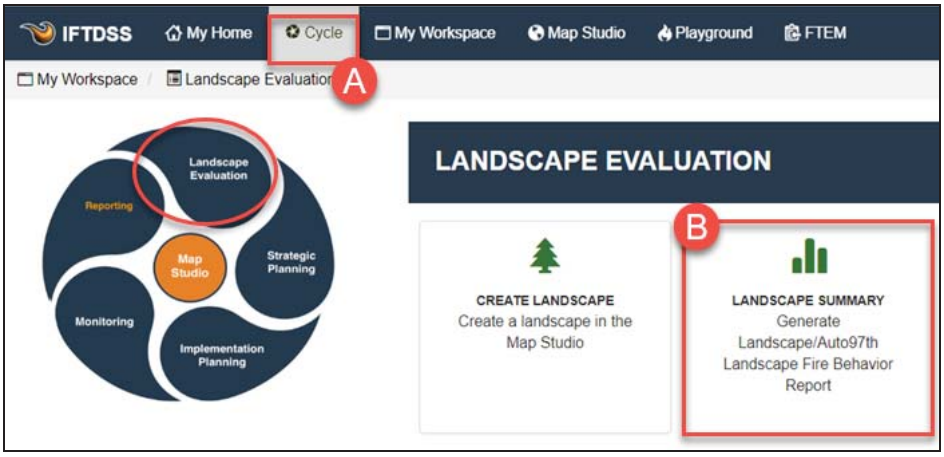
Next, run a summary report and compare these fuel models with potential landscape fire behavior.

Summarizing the Landscape

Creating an Automatic 97th Percentile Landscape Fire Behavior (Auto97th LFB) Report, makes the outputs available in Map Studio and summarizes behavior and landscape features in a downloadable report with tables and charts. It also creates a model output layer that can be viewed in Map Studio. To create these:

A. Click on **Planning Cycle** in the top navigation.

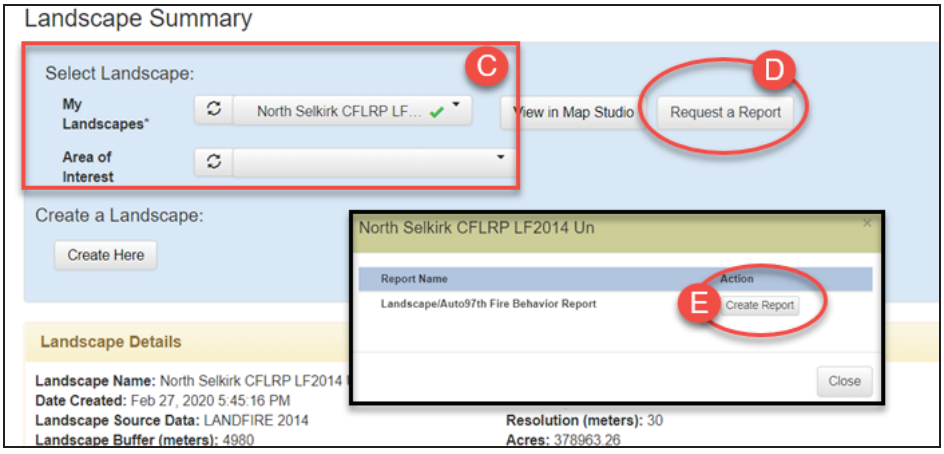
B. The cycle opens on the **Landscape Evaluation** stage by default, from there click the **Landscape Summary** task.



C. In **Landscape Summary**, click the drop-down menu next to **Select Landscapes**. If the newly created land-scape doesn't appear in the drop down, use the **Refresh** button after giving the landscape a short time to process. The landscape appears with a green check next to it (which indicates it has downloaded completely to your IFTDSS account). If you wanted to create a report just for an Area of Interest, you'd use the Area of Interest drop-down menu to select a shape or shapefile. For this example, leave Area of Interest blank in order to produce a report for the entire landscape.

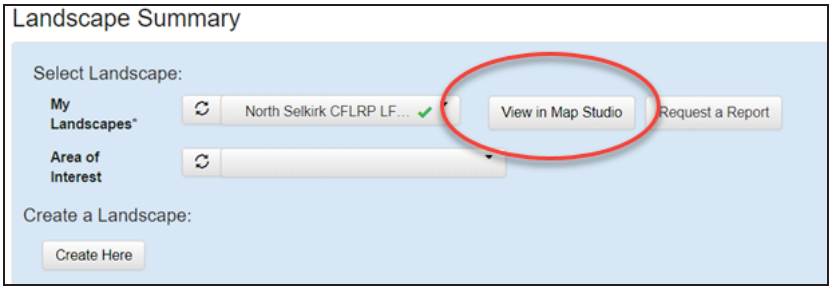
D. Click **Request a Report**.

E. Confirm your selection by clicking **Create Report** in the box that appears. The report begins processing and may take a few moments.



To make sure the report is complete, click the **Refresh** button that appears where the **Create Report** button once was. When complete, a green check-mark appears next to the report name, which becomes a hyper-link.

F. For this example you are going to view the fire behavior aspect of the report in Map Studio so it can be viewed with the landscape features, so close the report box and click the **View in Map Studio** button. The report and Map Studio outputs can be viewed anytime later by accessing them in **My Workspace**, they are saved in the same folder as the landscape they describe (in this case your Granite Creek project folder).



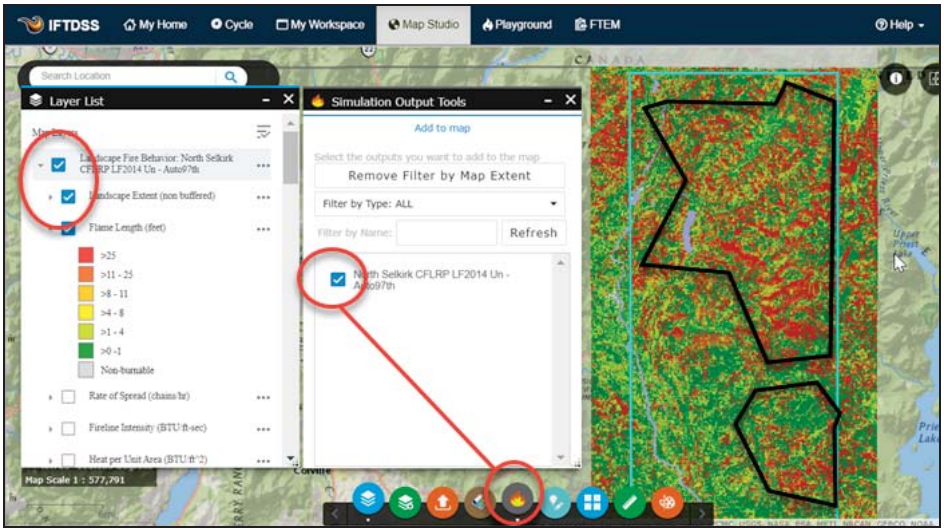
Comparing Landscape Features and Model Outputs with the Swipe Widget

After clicking **View in Map Studio**, the fire behavior model layer will automatically open. For future use, you can remove or add other modeling layer to Map Studio by clicking the **Simulation Output Tools** widget on the bottom of the screen and checking or unchecking the boxes next to each modeling output.

A. If the layer did not automatically open, click the **Simulation Output Tools** widget on the bottom of the screen.

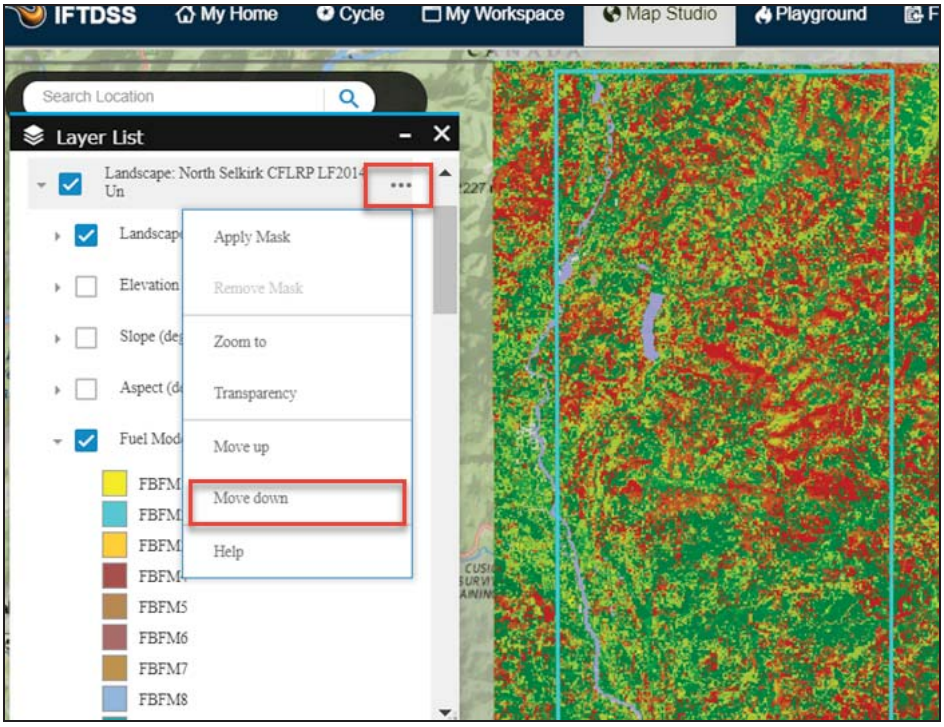
B. Ensure the box next to “North Selkirk CFLRP LF2014 UN-Auto97th” is checked so this layer opens on the map and is visible in **Layer List**. Check the appropriate boxes in **Layer List** to view Flame Lengths and the corresponding legend as displayed below.

Zoom into an orange/red area where you can see concentrated areas high Flame Lengths projected by the model. Next, you'll look at the fuel models and topography for the area of more intense fire behavior.



C. To compare these model outputs with your landscape, add the North Selkirk CFLRP LF2014 Un unedited landscape back to Map Studio by opening the **Landscape Tools** widget , clicking the **Add to Map** tab and using the checkbox to add the "North Selkirk CFLRP LF2014 Un". Use the drop-down arrows and check-boxes in **Layer List** to display only the landscape Fuel Model layer and the Model output Flame length layer.

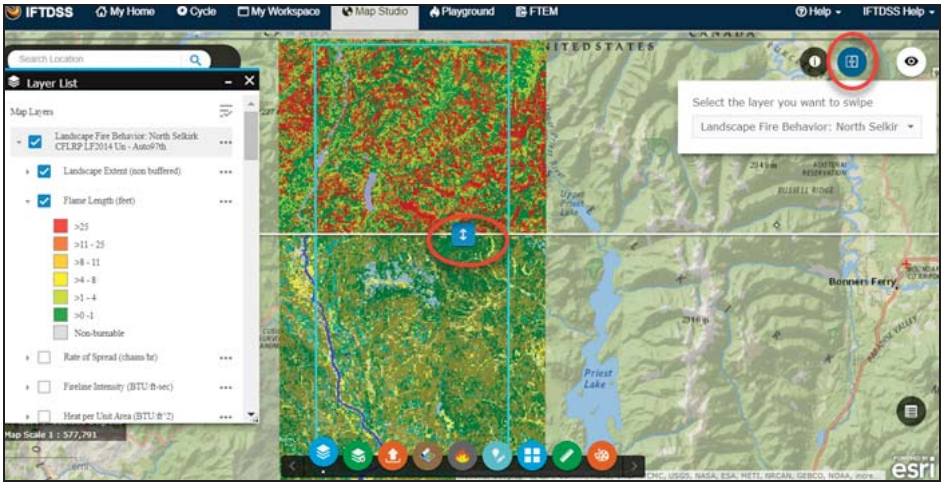
> To move a layer group, such as Landscape, up or down in Layer List, click the **More Options** button to the right of the layer and choose "Move up" or "Move down".



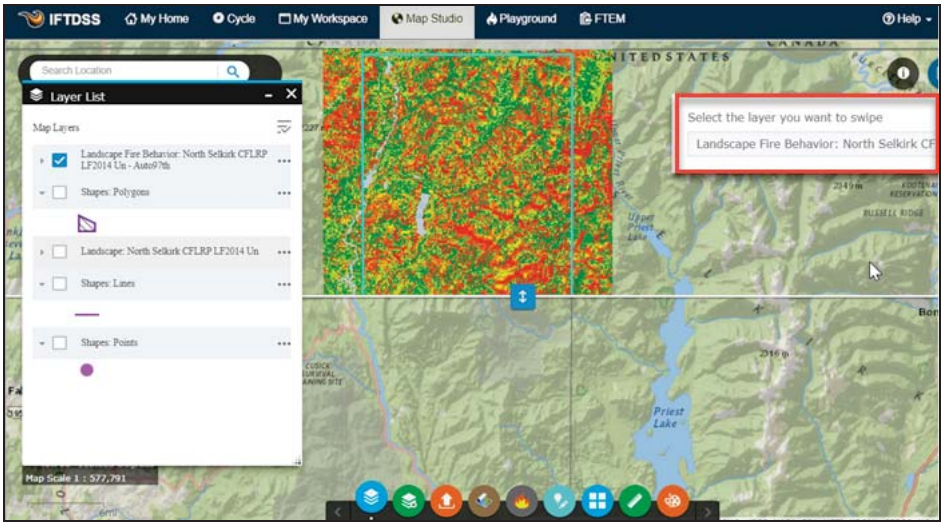
Next you'll compare the two using Swipe:

A. Click the **Swipe** widget in the top right of Map Studio.

B. Next, specify the layers to swipe. By default, the first layer in **Layer List** will be the one displayed in the Swipe box, and will appear in the top portion of the map, the next visible layer in the Layer List will be the layer displayed under it. In the example below, "Model Output: North Selkirk CFLRP- LF2014 Un—Auto97th" is displayed on the top, and the Landscape layer is displayed on the bottom. Slide the bar in the middle of the screen up and down. Notice the areas with high flame lengths correspond to areas of Fuel Model 165 (TU5) with small patches of 122 (GS2).



Next, you'll want to view the topography to see how it corresponds to the areas displaying more intense fire behavior. Uncheck the boxes in the Layer List then recheck the "North Selkirk CFLRP- LF2014 Un—Auto97th" layer. This will display only that behavior layer, and allow you to see the topography underneath. If this does not occur on your map, move your mouse up to the swipe box and make sure the Model Output layer is selected (See Swipe widget for more detail).



As you swipe up and down, you will notice all the areas displaying more intense fire behavior are south, southeast, and southwest facing slopes. Wrapping up this analysis by repeating this process in the northern part of the landscape, you notice there appears to be several areas that would produce more intense fire behavior. Also compare other aspects of fire behavior, such as Rate of Spread and Crown Fire Activity.

With this information, you decide to create two Areas of Interest, or areas on which you'd like to focus the analysis and treatments.

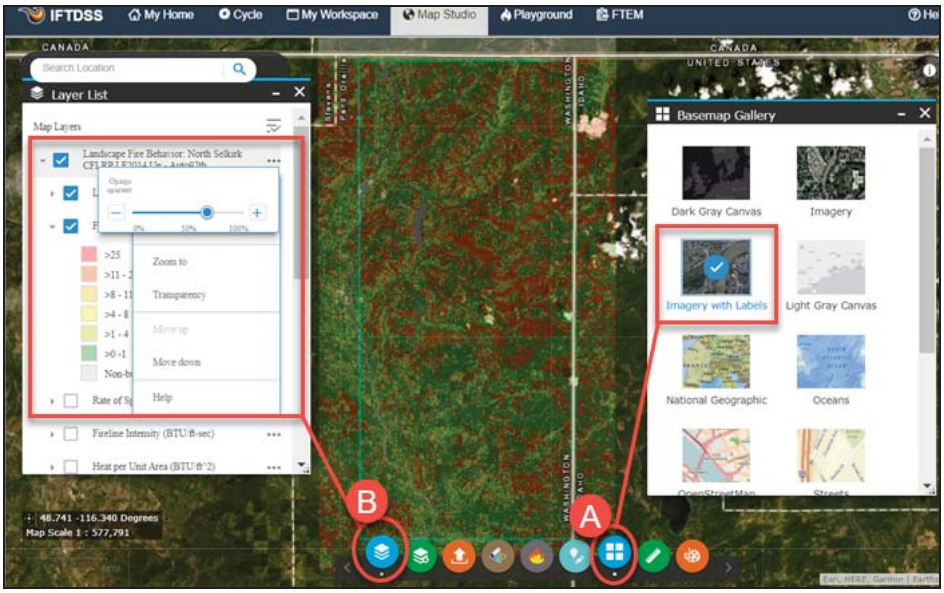
Section 3– Creating Areas of Interest

To create an Area of Interest (AOI), or polygon, you'll first adjust the layer visibility to make it easier to identify the area on which you'd like to focus:

A. If you have not done so already, change the **Basemap Gallery** layer to "Imagery with Labels" so you can see the landscape imagery.

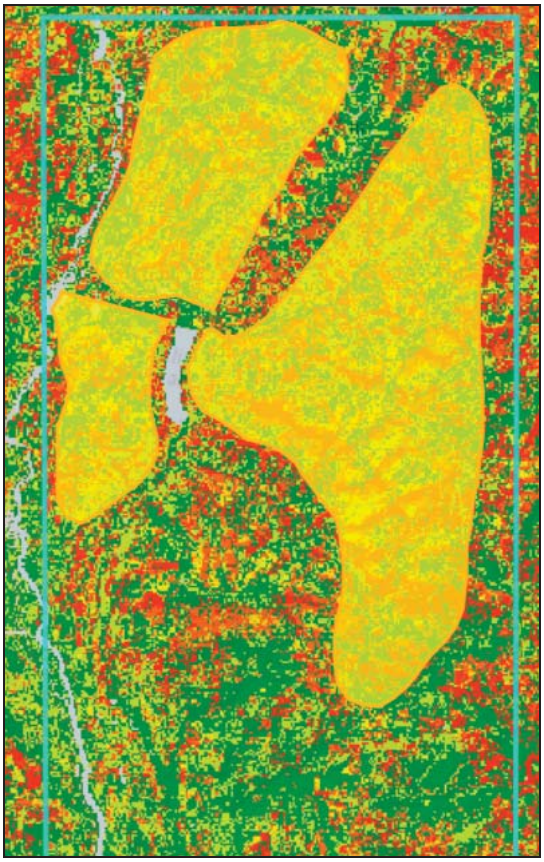
B. Set up the **Layer List** to show the 97th percentile fire behavior output layer for "Flame Lengths", and set the transparency so you can see roads and

topography as you create your AOI, or treatment area.



C. Select the **Create/Edit Shapes** widget at the bottom of the screen and ensure Polygons is selected in the drop-down box in **Create/Edit Shapes**.

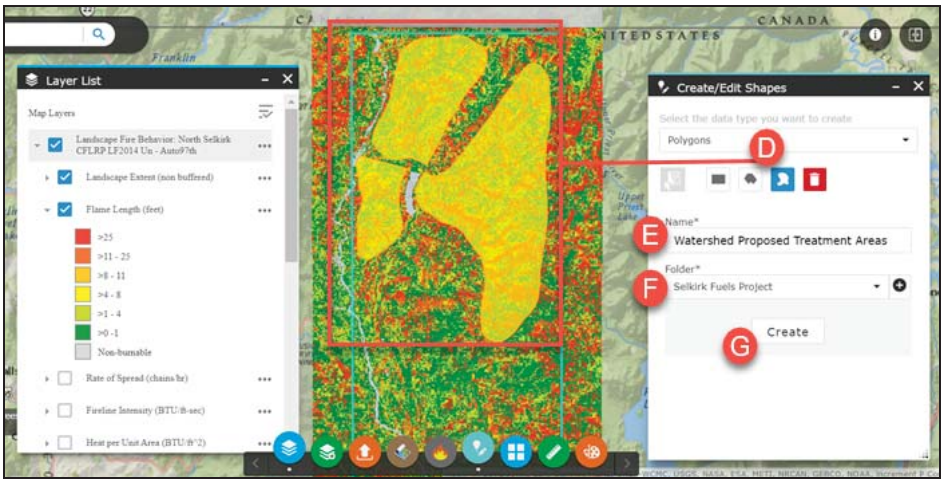
D. Next you will create two shapes similar to those shown below (they need not match exactly). Select the **Freehand Polygon** option, and draw a shape around one of the areas of significant fire behavior. Select the Freehand Polygon option again and draw a second shape around the second area that exhibited significant fire behavior. You'll concentrate on these areas for developing and comparing treatments to meet the objectives of reducing the fire hazard in this area, and returning low intensity fire to this land-scape.



E. Name this “Watershed Proposed Treatment Areas”.

F. Select the “Selkirk Fuels Project” folder. This will ensure that AOI is filed in the same location in **My Workspace** as all the other Selkirk Fuels Project files.

G. Click **Create**. These three areas are now saved as a single shape and available in the Layer List in Map Studio, as well as in your “Selkirk Fuels Project” folder in **My Workspace**.



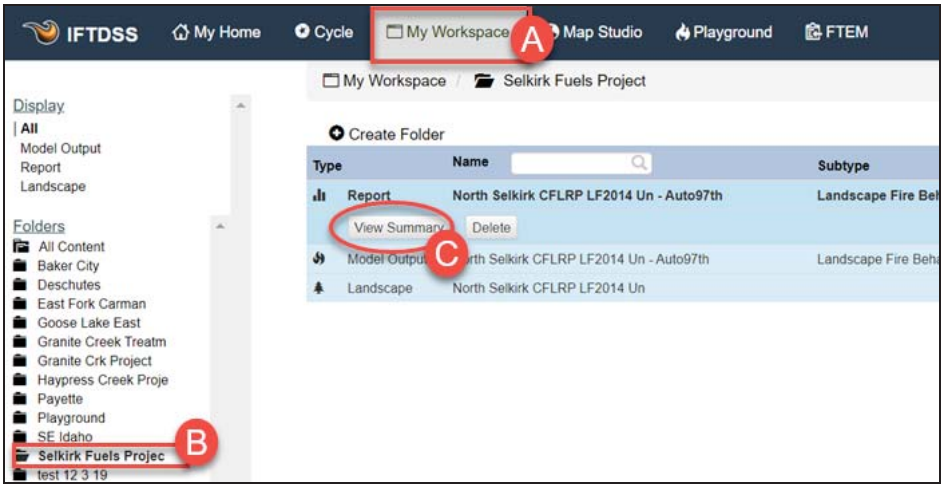
Section 4– Reviewing the Auto97th LFB Report

Now that you've thoroughly reviewed the map to assess the landscape, modeled fire behavior, and areas for treatment, you'll want to look at the corresponding landscape and fire behavior summary reports.

A. Navigate away from Map Studio and click on **My Workspace** at the top of the screen.

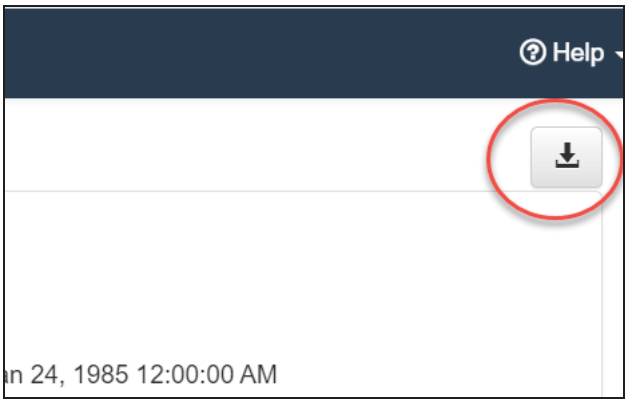
B. Because the Landscape was assigned to the Selkirk Fuels Project folder when you first created it, the model output summary report will also be stored there by default. Select the "Selkirk Fuels Project" fold-er from the panel on the left of the screen. As you navigate, you'll notice the information in the right-hand panel changes too, updating as you move through different screens.

C. Select the "North Selkirk CFLRP LF2013 Un—Auto97th" report file and click the **View Summary** button. The report will open in a new browser tab.

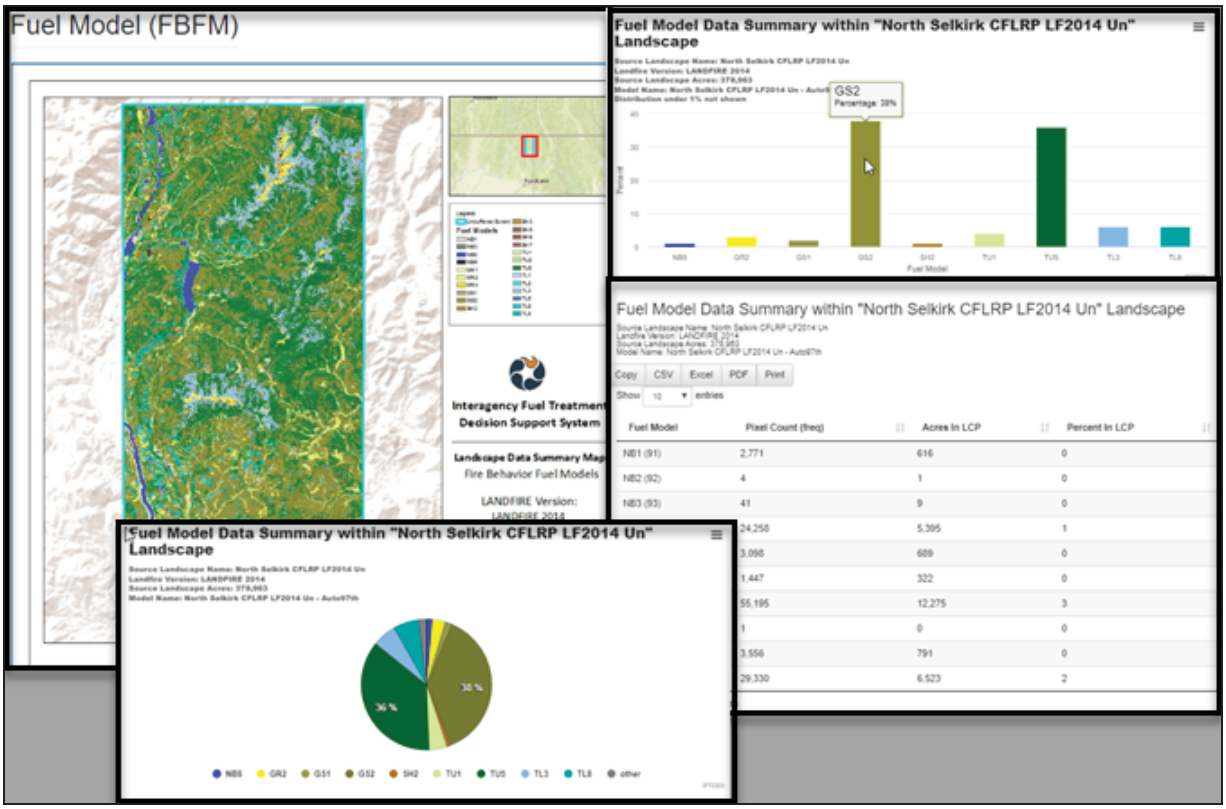


D. In the top right of the report, click the **Download** button to save a copy to your

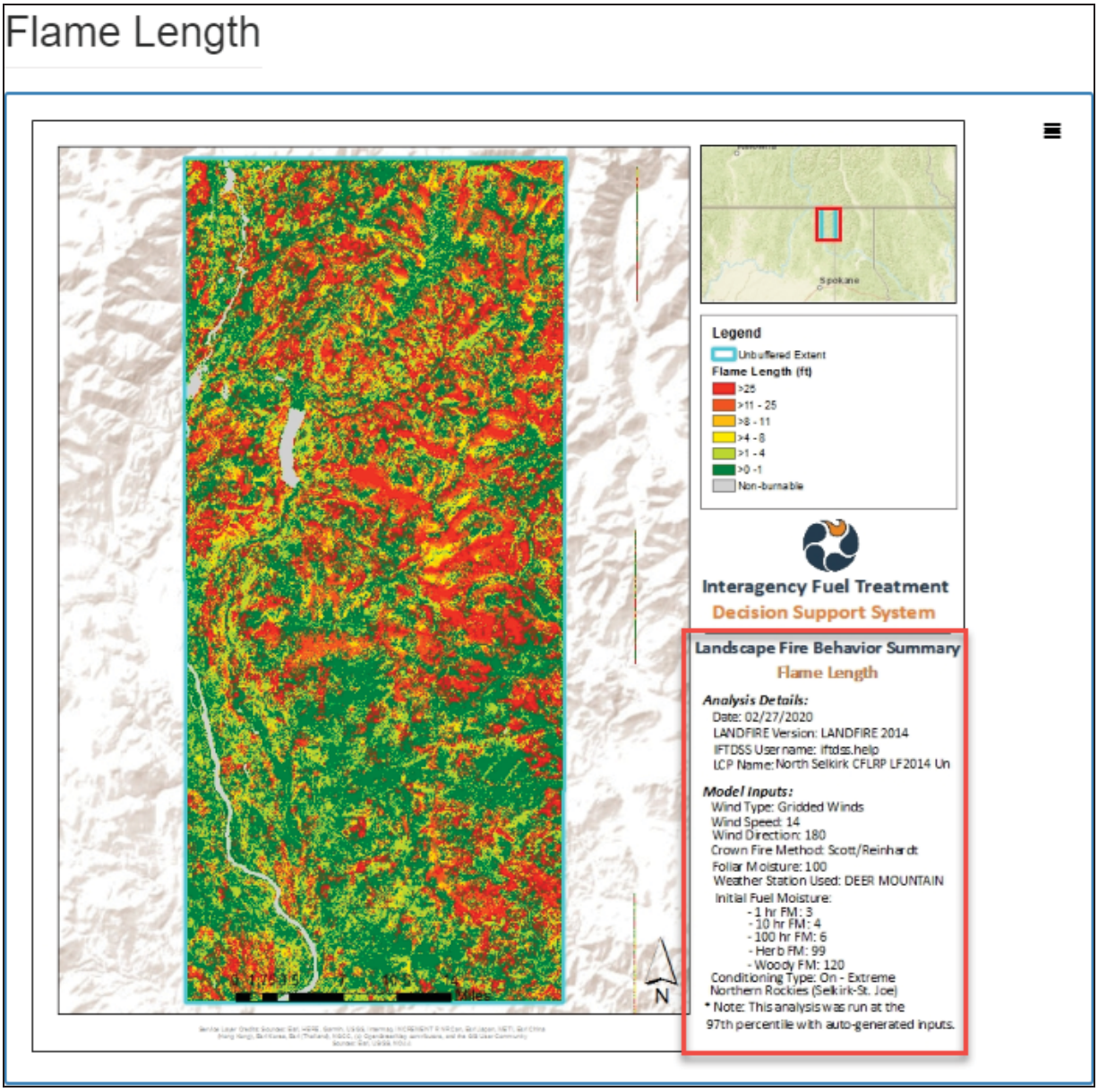
local computer, you'll re-fer to this PDF again later in this tutorial.



All of the Landscape characteristics and Fire Behavior outputs you viewed in Map Studio are quantitatively displayed in several different formats in this report. You'll find a lot of value in these reports because they break each component (Canopy Cover, Canopy Base Height, Rate of Spread, etc.) down in a way that makes it even easier, after viewing the spatial data, to assess the landscape and 97th percentile modeled fire behavior. For example, in viewing the Fuel Model map (upper left corner), you can see that there is a lot of Fuel Model TU5 on the landscape, but it's not until you take a look at the graphs that you can really assess that, in fact 36% of this landscape is attributed to the TU5 fuel model.

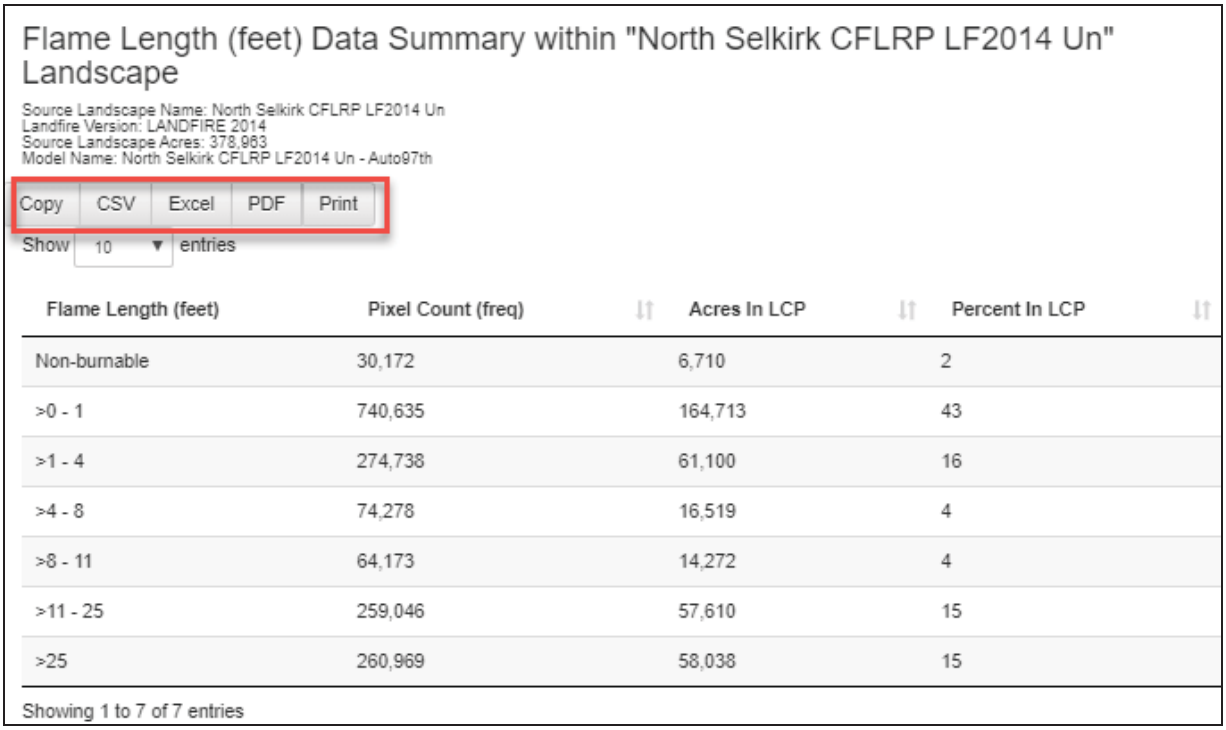


Take a good look at the report in it's entirety, including the Flame length outputs:



Notice the Auto97th Fire Behavior section of the report has recorded the 97th percentile weather and fuel moisture inputs used to run the fire behavior model. You'll want to use these values when you re-run the fire behavior model a little later in this tutorial. If you have not already saved a PDF copy of the report, scroll up to the top of the report, look to the top right, and click the **Download** button to save this report as a PDF on your local machine.

Each chart also has a download button to the right so it may be downloaded individually for use in your own documents. Tables have download buttons under the table descriptions.



Flame Length (feet) Data Summary within "North Selkirk CFLRP LF2014 Un" Landscape

Source Landscape Name: North Selkirk CFLRP LF2014 Un
Landfire Version: LANDFIRE 2014
Source Landscape Acres: 378,983
Model Name: North Selkirk CFLRP LF2014 Un - Auto97th

Copy CSV Excel PDF Print

Show 10 entries

Flame Length (feet)	Pixel Count (freq)	Acres In LCP	Percent In LCP
Non-burnable	30,172	6,710	2
>0 - 1	740,635	164,713	43
>1 - 4	274,738	61,100	16
>4 - 8	74,278	16,519	4
>8 - 11	64,173	14,272	4
>11 - 25	259,046	57,610	15
>25	260,969	58,038	15

Showing 1 to 7 of 7 entries

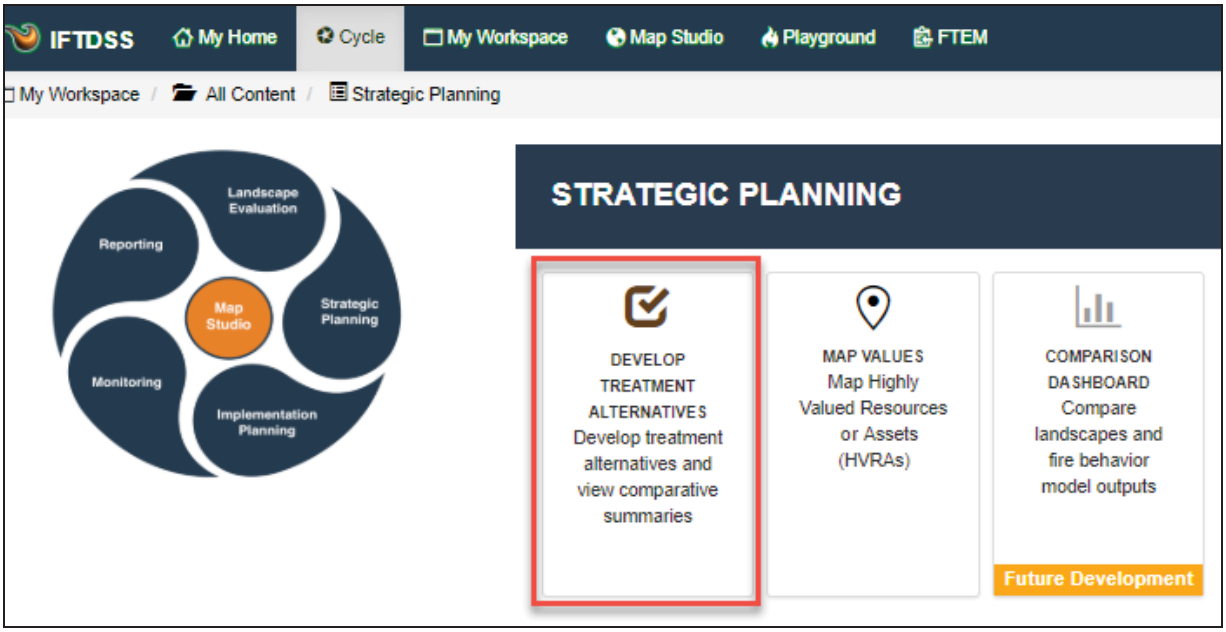
Next, it's time to develop some treatment alternatives.

Section 5– Developing Treatment Alternatives

Starting the Develop Treatment Alternatives Task

Now that you have a baseline data for the landscape and fire behavior, and specific areas for which you'd like to propose treatments, you'll move on to the Develop Treatment Alternatives workflow. This task is under the **Strategic Planning** stage of the **Cycle**. Here you will develop and compare fuels treatment alternatives so you can determine how changes in the fuels characteristics affect fire behavior outputs.

Start by selecting the **Develop Treatment Alternatives** task.



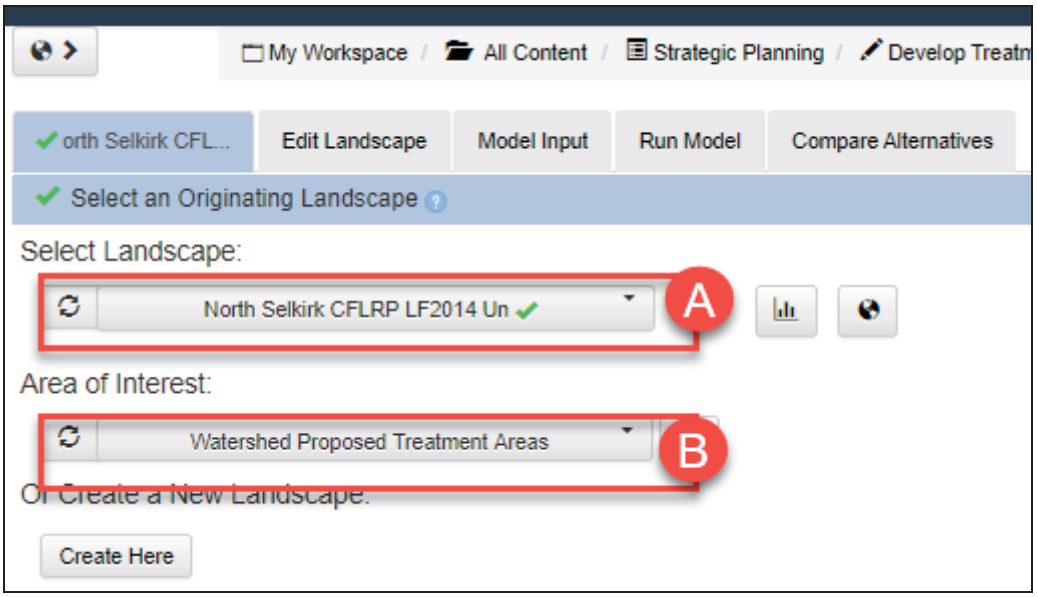
The Develop Treatment Alternatives screen contains five tabs, or steps. You'll proceed through each one using the steps below.

Pick a landscape and area of interest

A. A. Select the "Originating Landscape" (North Selkirk CFLRP LF2014 Un). The Originating landscape sets the landscape extent for the rest of the workflow. Originating landscapes displayed in the drop-down menu will always be unedited LANDFIRE layers. Any edited layers you've created that match that extent will become available in subsequent tabs.

B. B. Select the AOI created earlier in Map Studio (Watershed Proposed Treatment Areas). This will constrain the analysis to the treatment areas. If Area of

Interest was left blank, the analysis would be applied to the entire landscape.



Edit the landscape to simulate treatment scenarios

Next, move to the **Edit Landscape** tab, where you'll select a Default Fuels Treatment rule, and apply it to the AOI to simulate a thin and pile burn. This will create a version of your landscape with edits applied to your areas of interest. Later you will see how this proposed treatment affects fire behavior. To create the edited landscape:

A. Select the "North Selkirk CFLRP LF2014 Un"landscape as your starting landscape. If you'd like to see your selected landscape while editing, click the **Split Screen** button in the top left.

B. Click **Add Default Fuels Treatment/Disturbance Edit Rule** to display editing options.

C. Click **Thin: Slash Removed**, then select the "Light Thinning; Pile Burning" option.

D. Choose the "Light Thinning: Pile Burning" option.

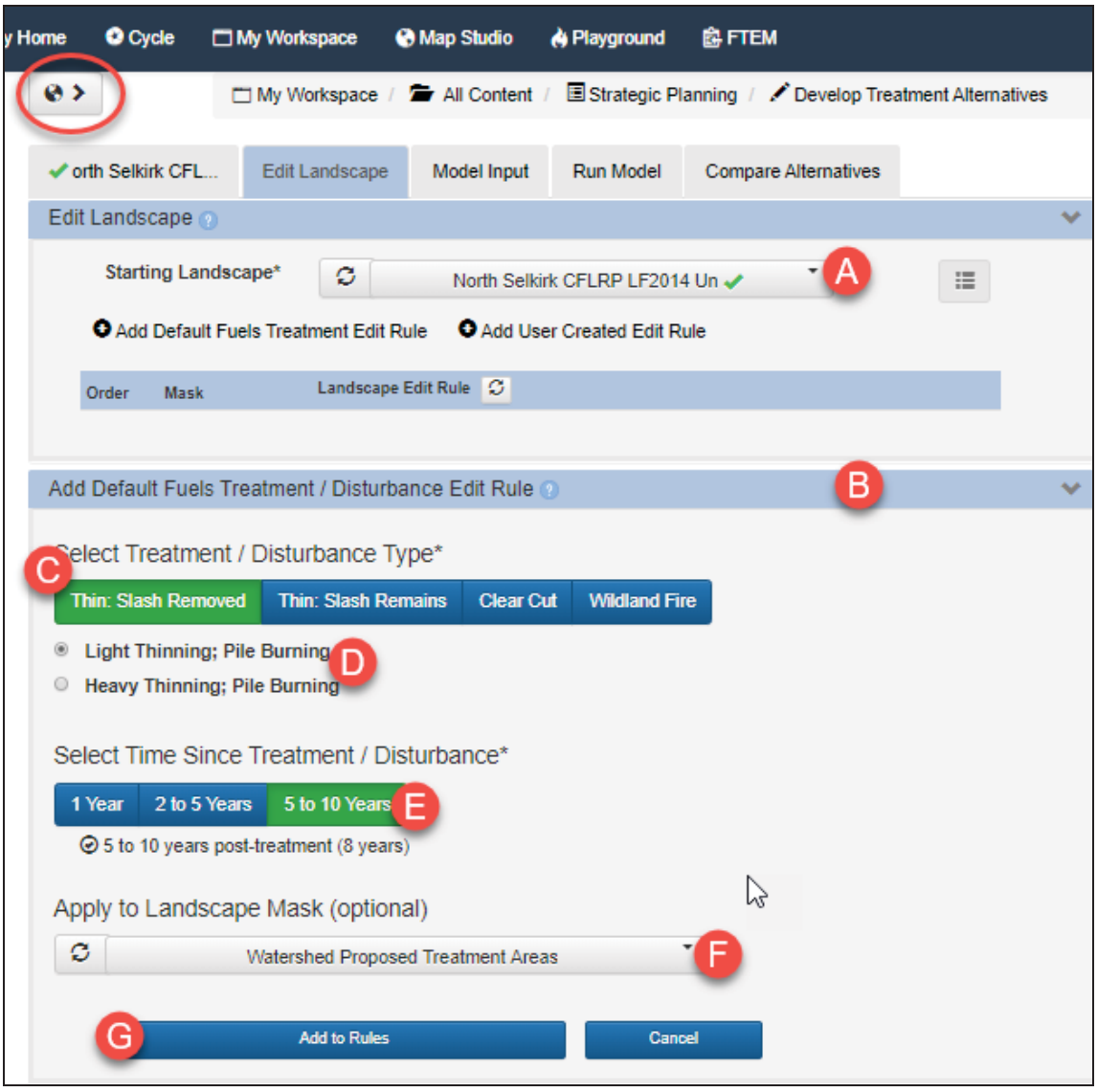
> If you hover your mouse over the "Light Thinning: Pile Burning" option, it will give you the details on what the rule represents.

E. Select 5 to 10 Years since disturbance.

F. Select the “Watershed Proposed Treatment Areas” mask to apply the rule to that area.

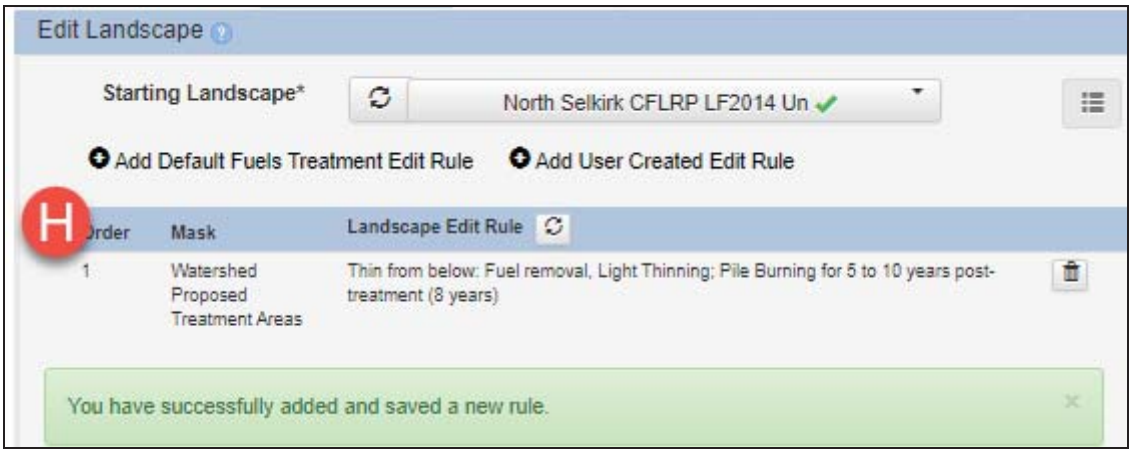
G. Click the **Add to Rules** button.

This rule will mimic thinning the AOI to about 80 % present density by removing understory up to 8” DBH with subsequent pile burning of thinned material. This information appears if you hover over the “Light Thinning: Pile Burning” option described in step C above. Alternatively, the description of each default rule can be read in the Landscape Editing—Default Fuel Treatment and Disturbance topic.



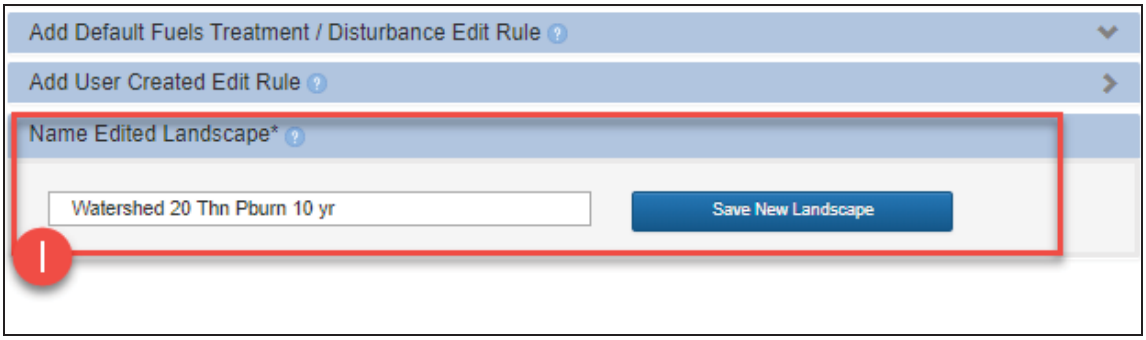
H. Your rule will be displayed at the top of the screen along with a green confirmation box. Leave this rule as-is, but know that if you had made a mistake and needed to discard the rule, it could be deleted using the **Delete** button

shown to the right of the rule.



Later, you'll also mimic a broadcast burn after the thin and pile. While you could create a second rule that would be applied after the first (See Rule Ordering Considerations for more detail on these), you'll apply one at a time so it's easier to track the results of the rule on the landscape. It's always a good idea to assess your landscape after editing to ensure the rule has been applied correctly and the result makes sense.

I. To finalize and create your edited landscape, scroll to the bottom of the editing page, input a landscape name that is representative of the edits (Watershed 20 Thn Pburn 10 yr), and click Save New Landscape.



Proceed to the Model Input tab.

Keep the landscape names around 30 characters in length so they run smoothly through the comparison and reporting process within IFTDSS.

Enter parameters for a fire behavior modeling scenario

In the **Modeling Input** tab you'll use 97th percentile weather and fuel moisture inputs that were supplied in the PDF report you downloaded earlier. Open the PDF

copy of the Auto97th report and scroll until you find the Crown fire output map, values will be displayed in the bottom right o f the map box. If you did not save a PDF, you could also obtain this information by accessing my Auto97th report in **My Workspace**, but with a PDF, you don't have to navigate back to this point in the treatment alternatives task.

A. Enter the inputs for wind, crown fire inputs, and initial fuel moisture, based on the Auto97th report run earlier:

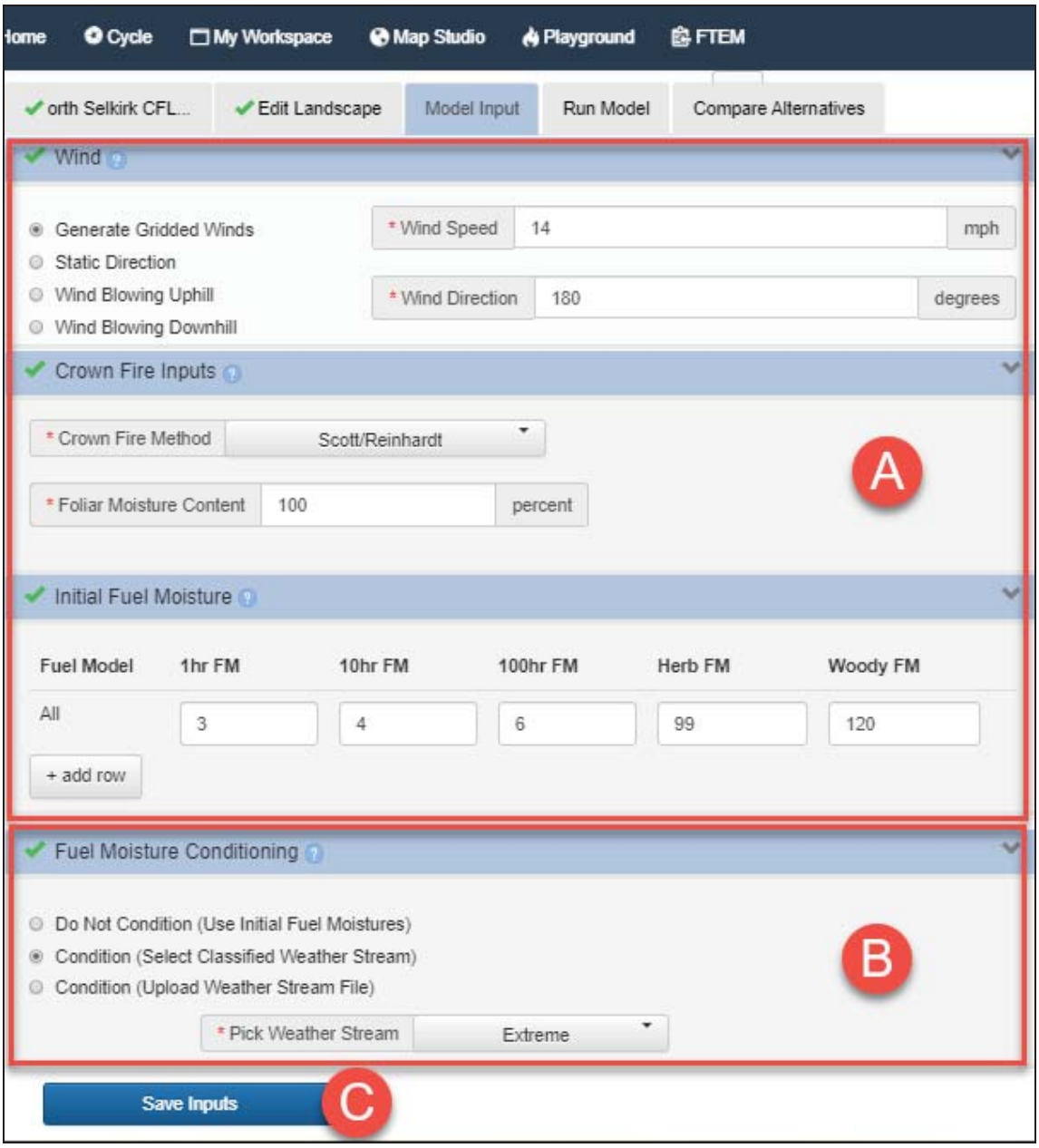
   - Generate Gridded Winds left selected
   - Wind Speed: 14
   - Wind Direction: 180
   - Crown Fire Inputs: Scott/Reinhardt selected and a foliar moisture percent of 100
   - Initial fuel moistures of 3, 4, 6, 99, and 120 for 1hr, 10hr, 100hr, herb, and woody fuel moistures, respectively.

   By not clicking **+ add row** under the "Initial Fuel Moisture" section, the fuel moistures will remain the same for all fuel models across the landscape. If you had clicked **+ add row**, you could enter specific fuel models and assign unique moisture conditions for each one.

B. For Fuel Moisture Conditioning, select "Condition (Select Classified Weather Stream)". This matches the conditioning indicated in the Auto97th PDF.

C. Click **Save Inputs** at the bottom of the screen and move to the **Run Model**

tab.

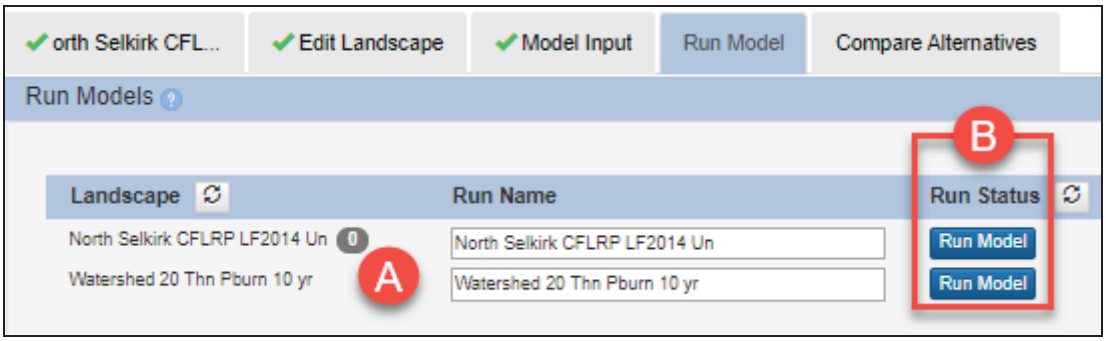


Running Fire Behavior

You'll want to run the fire behavior model on both of these landscapes here so you can compare the results:

A. Examine the names next to each o f the landscapes. If you wanted, you could rename them here, but leave them as-is for this tutorial.

B. Click **Run Model** next to each landscape.



C. Give the models a couple minutes to run. Hit the refresh button to the right of "Run Status" to see the model status, until both are completed.

Next, move to the **Compare Alternatives** tab.

Compare Alternatives

Once on the **Compare Alternatives** tab, you'll select each landscape you want to compare. The will be numbered in the order you select them, and from reading the right hand panel information, you 'll see that this order is very important:

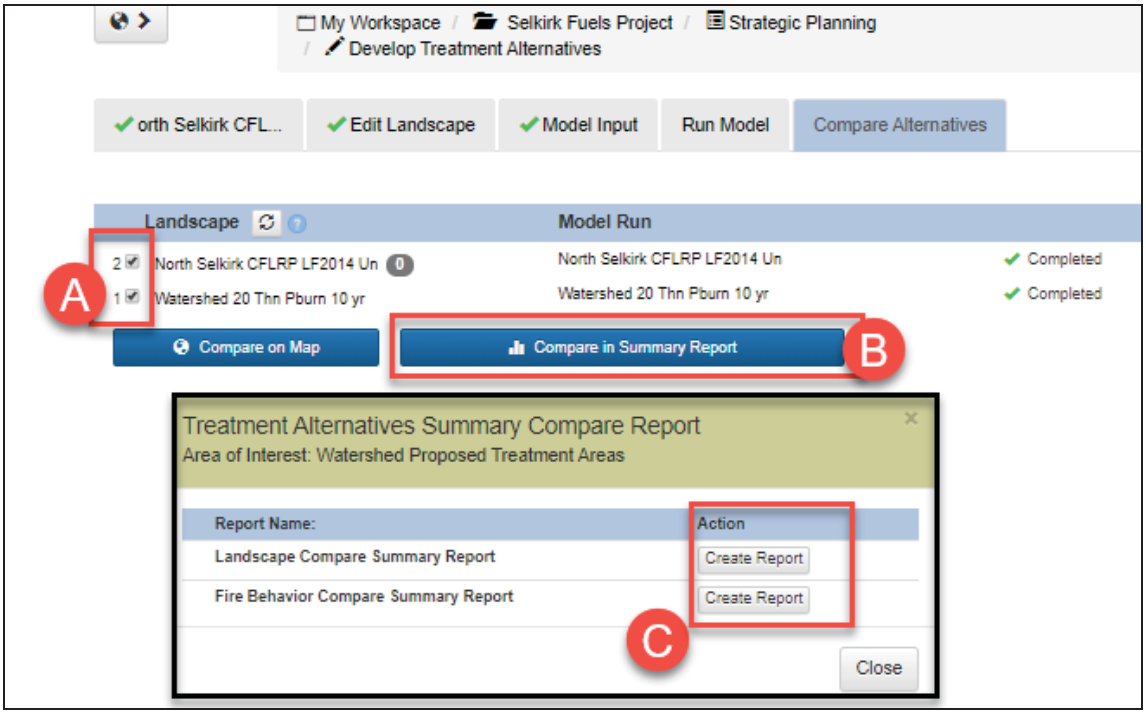
A. First, select the edited landscape so it has a "1" next to it. Then, select the original landscape, so it has a "2" next to it.

   This order tells IFTDSS to calculate the difference created by your treated landscape (1) on your original land-scape (2). For example, if your new landscape has flame lengths of 3 feet, and the original has flame lengths of 7 feet, the difference will be 3-7= -4. Or in other words, a 4 foot reduction in flame length resulting from the treatment.

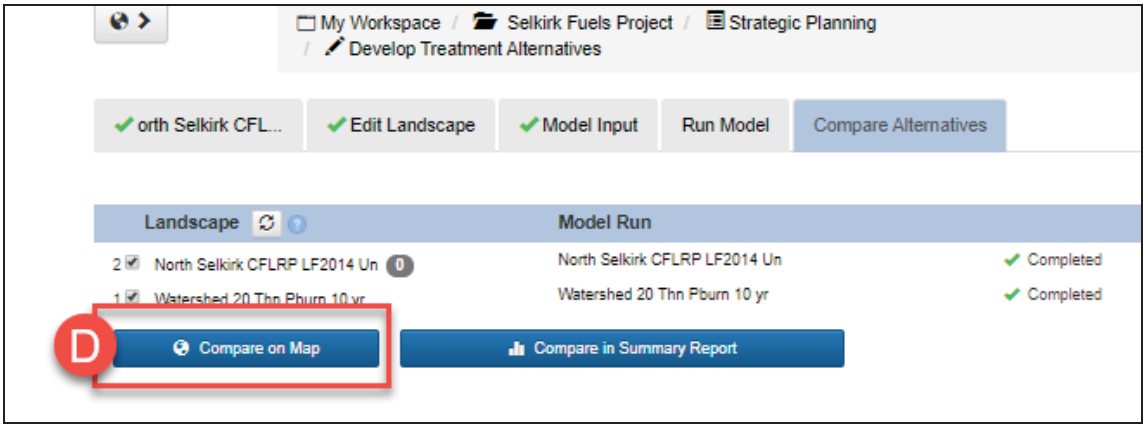
B. Now you'll want to view comparison outputs on the map and as a report. First, click the

   Compare in Summary Report button so the reports can begin processing.

C. Click both **Create Report** buttons.



D. Next, click the **Compare on Map** button to view results on the map and give the comparison layers a few seconds to download.



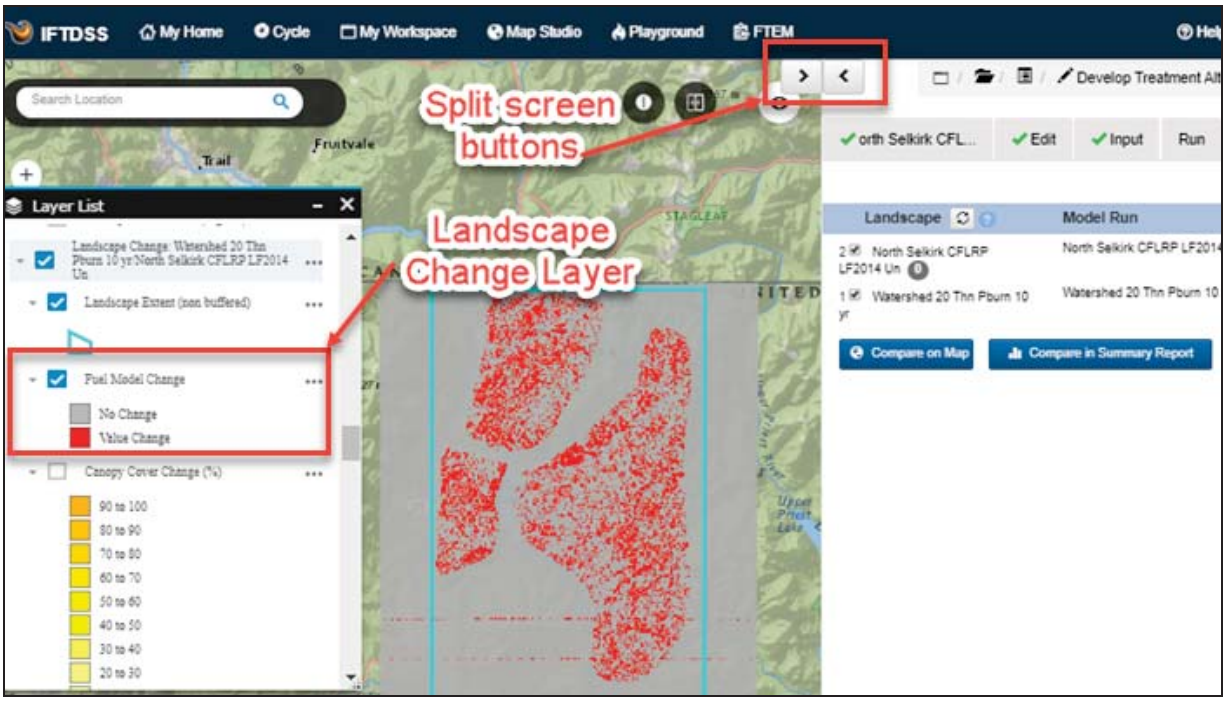
Section 6– Comparing and Adding Treatment Alternatives

Comparing the Alternatives

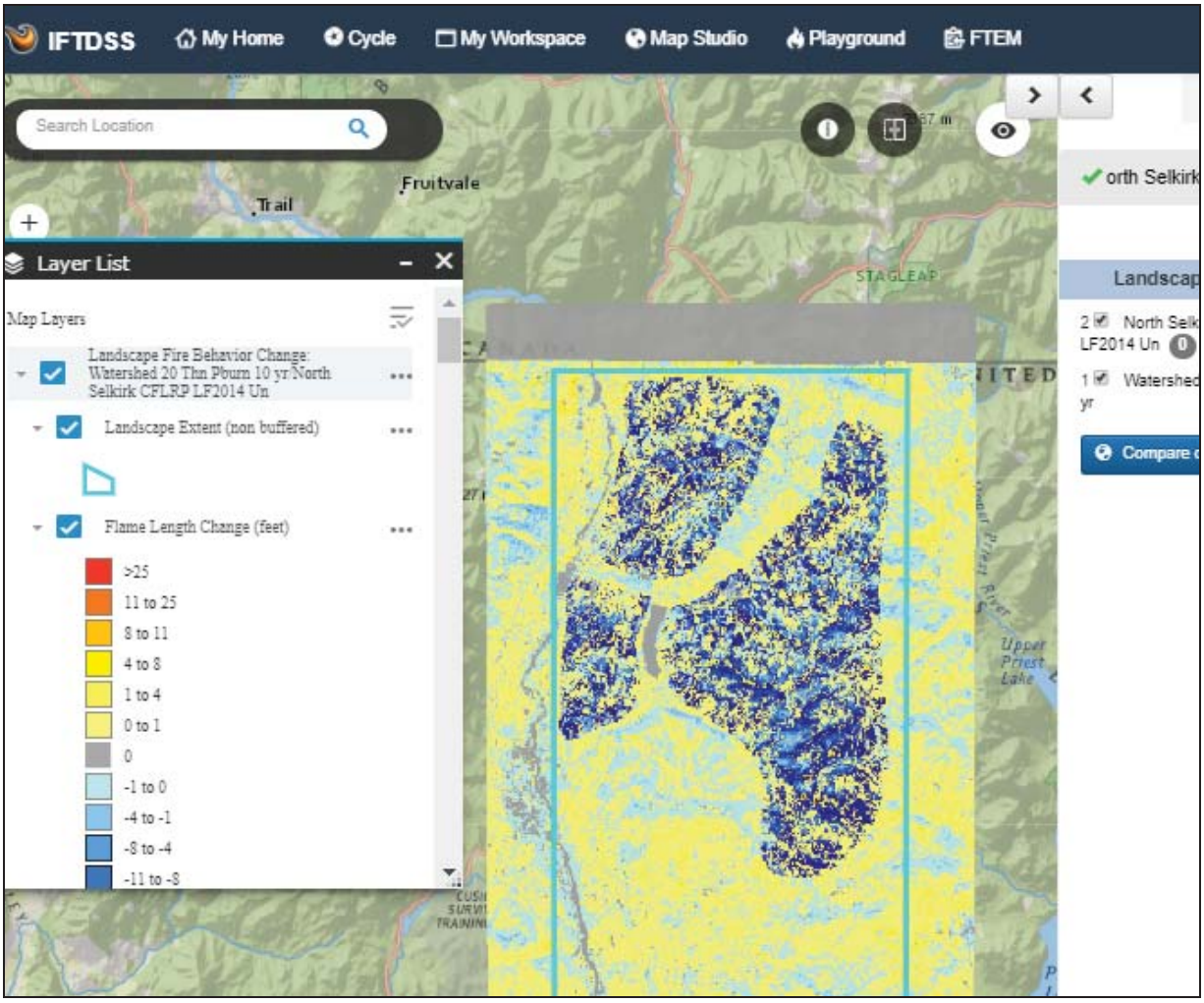
After clicking **Compare on Map**, the map appears in splitscreen mode. This allows you to view information from each tab on the right side of the screen, while allowing

you to view “My Map” on the left. You can open or close this feature anytime by selecting the opposing arrows icon at the top of the screen.

Initially, you’ll see a simple landscape change map, indicating which pixels experienced a Fuel Model change post-treatment.\



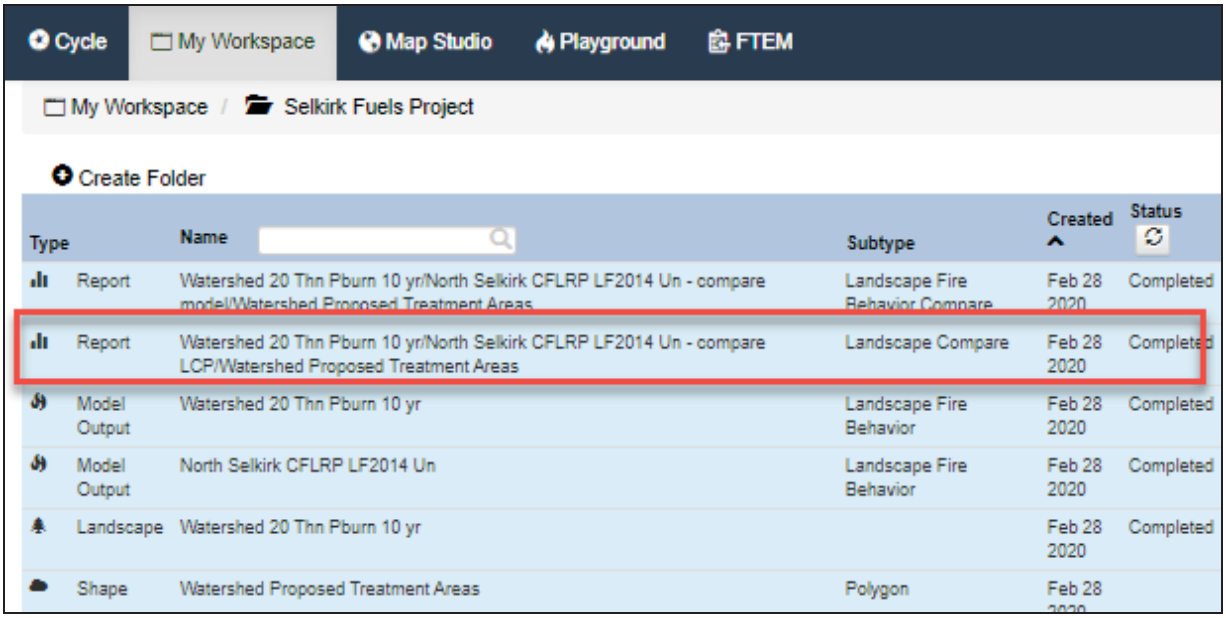
To view the change in Flame Length after the treatment, open **Layer List** and check the box next to: “Landscape Fire Behavior Change: Watershed 20 Thn Pburn 10 yr/North Selkirk CFLRP LF2014 Un”. This layer shows the difference between post-treatment and pre-treatment Flame Lengths. With a glance, you can see that all the dark blue showing on those South/North Facing slopes that had initially shown very high flame lengths, are now indicating significantly decreased flame lengths and fire intensity.



The change map is generated on the fly. To access the map later you can select the landscape in the **Develop Treatment Alternatives** task, and click through each tab to get back to this point.

To access the summary reports, you can either find them in your project folder in **My Workspace**, or click the **Compare in Summary Report** button again and click on the links displayed in the pop-up box.

In this case, go to **My Workspace** and first select, “Watershed 20 Thn Pburn 10 yr/North Selkirk CFLRP LF2014 Un - compare LCP/Watershed Proposed Treatment Areas”, you may have to hover over the shortened name to display the full name. Once this is selected, click **View Summary**.

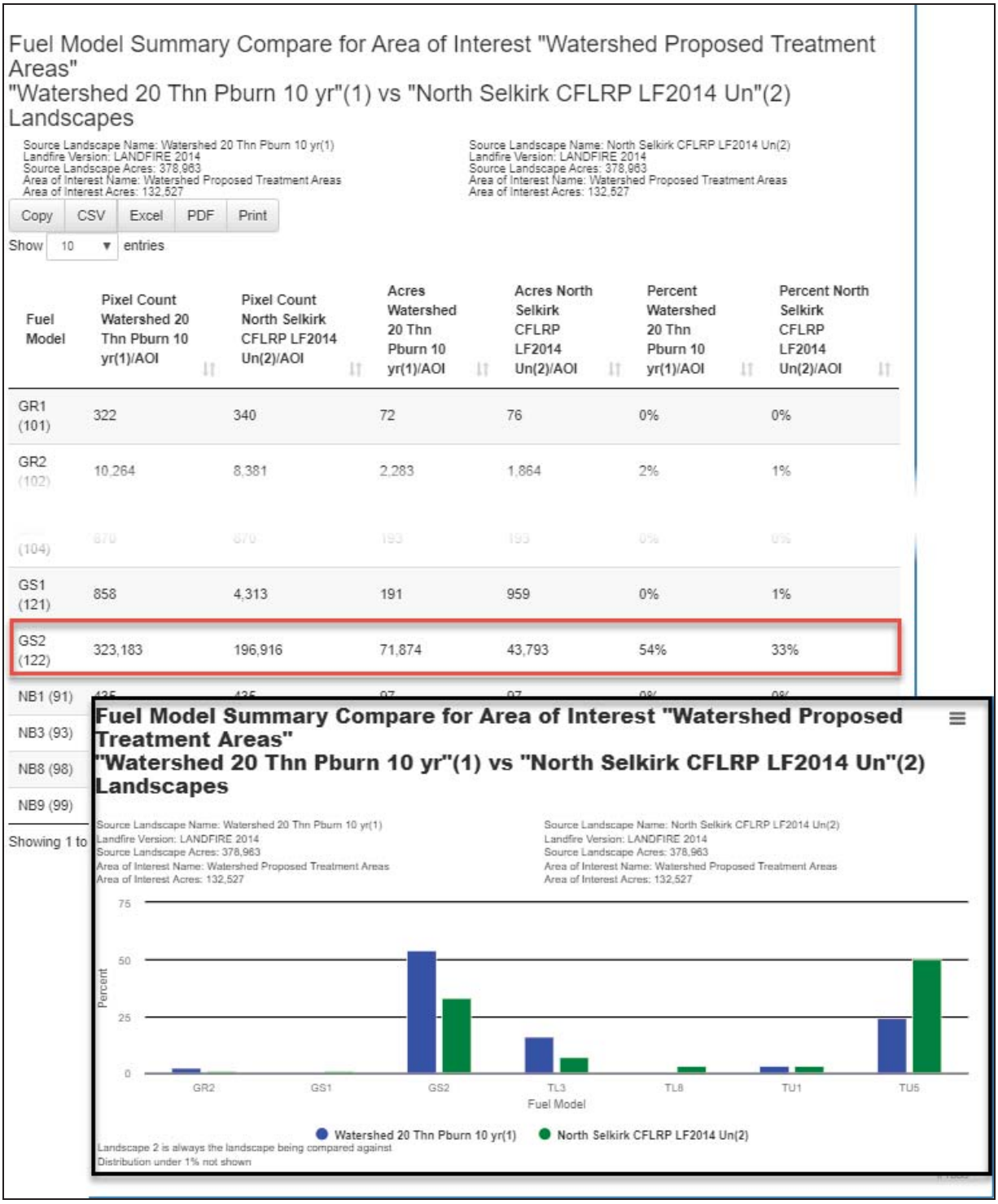


In the first bar graph, note the acreage for the AOI is displayed. This is a quick way to confirm the Develop Treatment Alternative task and resulting reports were actually run to quantify only the AOI, not the entire landscape.

Review the pre– and post– treatment results for each landscape characteristic. These reports have the same quantitative components as the reports you viewed earlier, but they compare the change in acreages in the specified treatment area, or mask, before and after the selected treatment was applied.

> Note the values in your report may vary slightly from the ones we're about display. This is because the area of interest you drew at the beginning at this tutorial won't exactly match the one we drew here.

In the Fuel Model bar graph, you can see that the green corresponds to pre-treatment fuel models in the treatment area, while blue corresponds to post-treatment. It appears that most of the TU5 acres were changed to GS2 post-treatment. Looking at the tabular data below, you can see that in fact, 54 % of the treatment area is now Fuel Model GS2 following this treatment, which (according to the fuel model) will re-sult in a decrease in spread rate and flame length.



Fuel Model Summary Compare for Area of Interest "Watershed Proposed Treatment Areas"
"Watershed 20 Thn Pburn 10 yr"(1) vs "North Selkirk CFLRP LF2014 Un"(2) Landscapes

Source Landscape Name: Watershed 20 Thn Pburn 10 yr(1)
Landfire Version: LANDFIRE 2014
Source Landscape Acres: 378,963
Area of Interest Name: Watershed Proposed Treatment Areas
Area of Interest Acres: 132,527

Source Landscape Name: North Selkirk CFLRP LF2014 Un(2)
Landfire Version: LANDFIRE 2014
Source Landscape Acres: 378,963
Area of Interest Name: Watershed Proposed Treatment Areas
Area of Interest Acres: 132,527

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Show 10 entries

Fuel Model	Pixel Count Watershed 20 Thn Pburn 10 yr(1)/AOI	Pixel Count North Selkirk CFLRP LF2014 Un(2)/AOI	Acres Watershed 20 Thn Pburn 10 yr(1)/AOI	Acres North Selkirk CFLRP LF2014 Un(2)/AOI	Percent Watershed 20 Thn Pburn 10 yr(1)/AOI	Percent North Selkirk CFLRP LF2014 Un(2)/AOI
GR1 (101)	322	340	72	76	0%	0%
GR2 (102)	10,264	8,381	2,283	1,864	2%	1%
(104)	870	870	193	193	0%	0%
GS1 (121)	858	4,313	191	959	0%	1%
GS2 (122)	323,183	196,916	71,874	43,793	54%	33%
NB1 (91)	435	435	97	97	0%	0%
NB3 (93)						
NB8 (98)						
NB9 (99)						

Showing 1 to

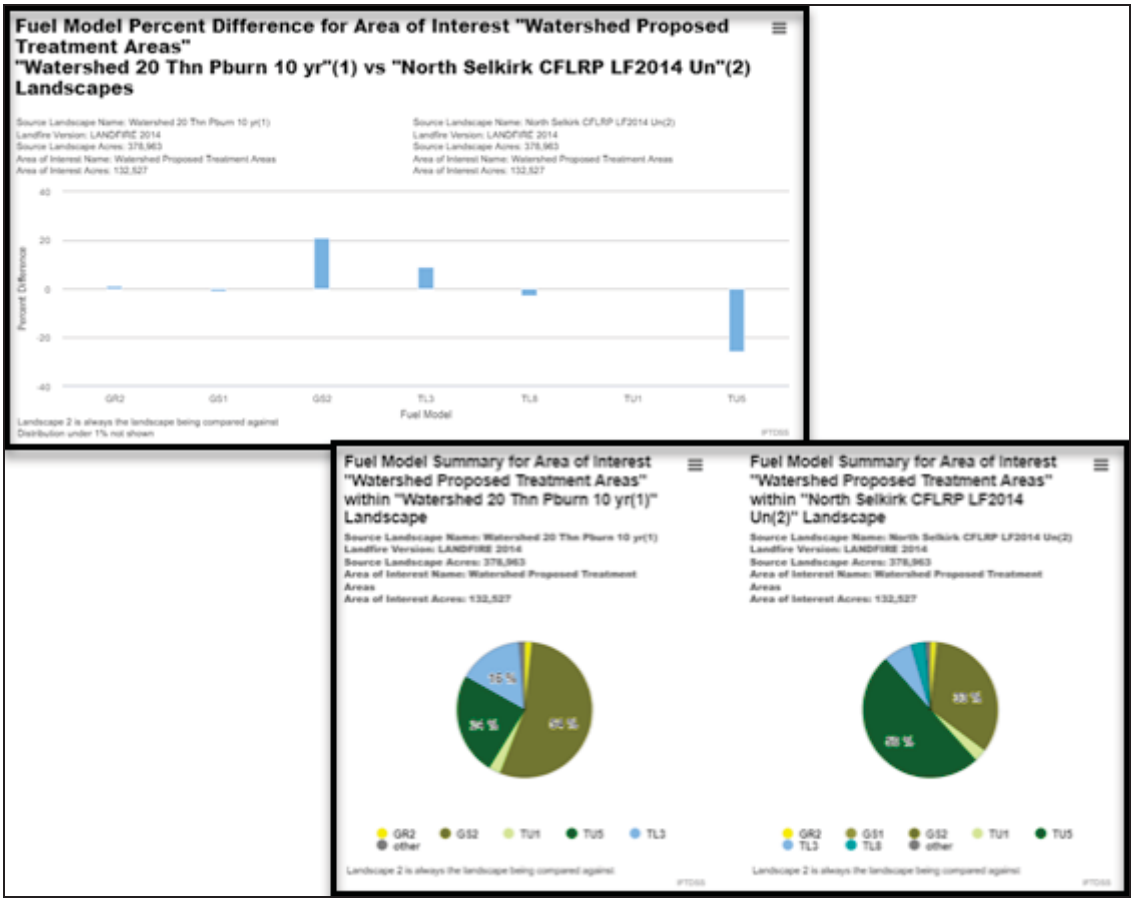
Fuel Model Summary Compare for Area of Interest "Watershed Proposed Treatment Areas"
"Watershed 20 Thn Pburn 10 yr"(1) vs "North Selkirk CFLRP LF2014 Un"(2) Landscapes

Source Landscape Name: Watershed 20 Thn Pburn 10 yr(1)
Landfire Version: LANDFIRE 2014
Source Landscape Acres: 378,963
Area of Interest Name: Watershed Proposed Treatment Areas
Area of Interest Acres: 132,527

Source Landscape Name: North Selkirk CFLRP LF2014 Un(2)
Landfire Version: LANDFIRE 2014
Source Landscape Acres: 378,963
Area of Interest Name: Watershed Proposed Treatment Areas
Area of Interest Acres: 132,527

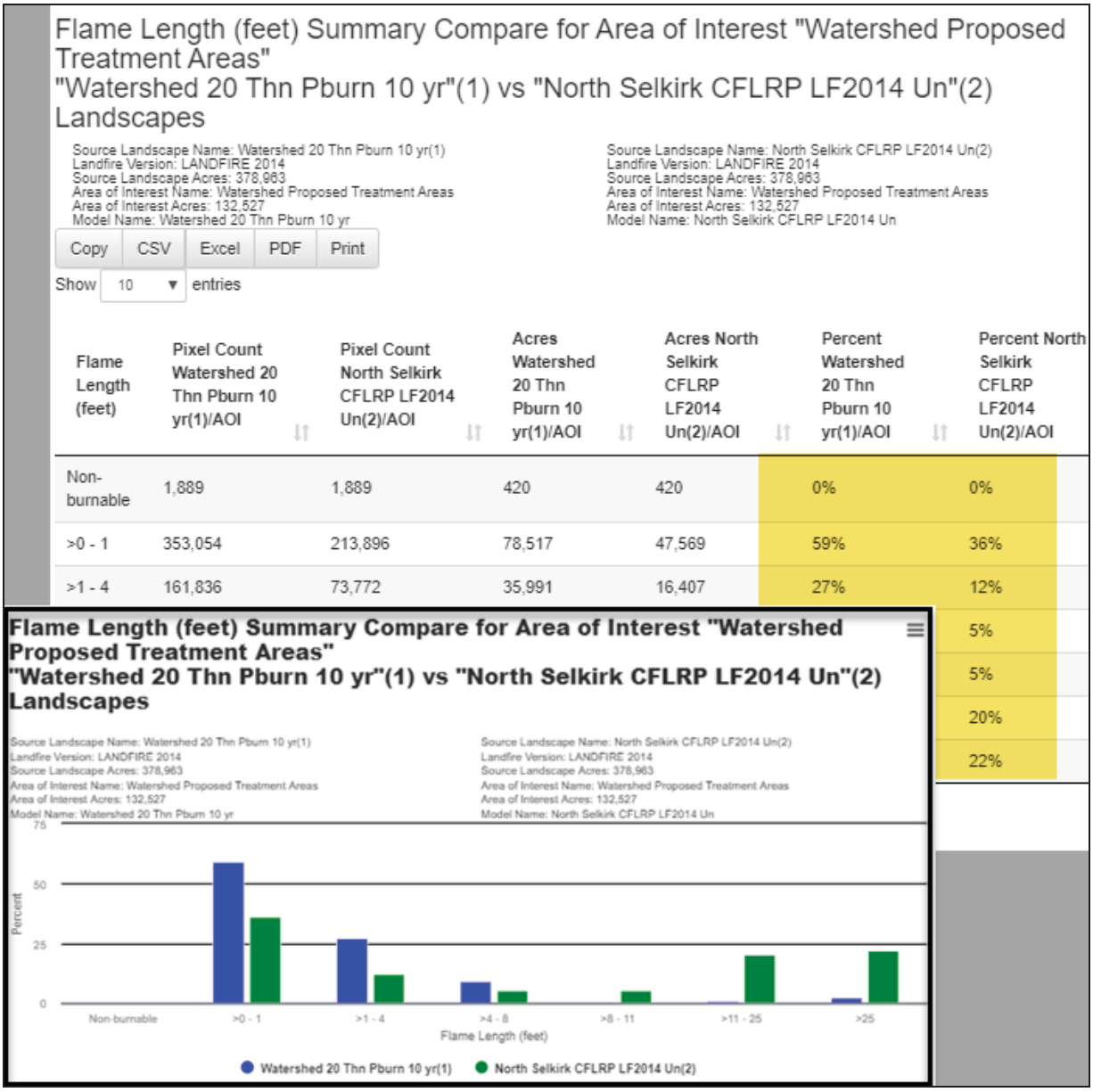
Landscape 2 is always the landscape being compared against
Distribution under 1% not shown

The Fuel Model Percent Difference graph and pie charts tell the same story.



Next, go to **My Workspace** and navigate to the Fire Behavior (Model) Compare Report, “Watershed 20 Thn Pburn 10 yr/North Selkirk CFLRP LF2014 Un - compare model/ Watershed Proposed Treatment Areas”, and click **View Report**.

As in the landscape Compare Report, green correlates with pre-treatment, while blue indicates post-treatment results in the bar chart. You can see from this bar chart that the number of acres in the lower Flame Length bins goes up post-treatment, while the number in the higher Flame Length bins goes down, indicating a decrease in higher Flame Length post-treatment. The table to the right quantitatively supports this, clearly showing the acres shifting toward the lower flame length bins, post-treatment.



Flame Length (feet) Summary Compare for Area of Interest "Watershed Proposed Treatment Areas"
"Watershed 20 Thn Pburn 10 yr"(1) vs "North Selkirk CFLRP LF2014 Un"(2) Landscapes

Source Landscape Name: Watershed 20 Thn Pburn 10 yr(1)
Landfire Version: LANDFIRE 2014
Source Landscape Acres: 378,963
Area of Interest Name: Watershed Proposed Treatment Areas
Area of Interest Acres: 132,527
Model Name: Watershed 20 Thn Pburn 10 yr

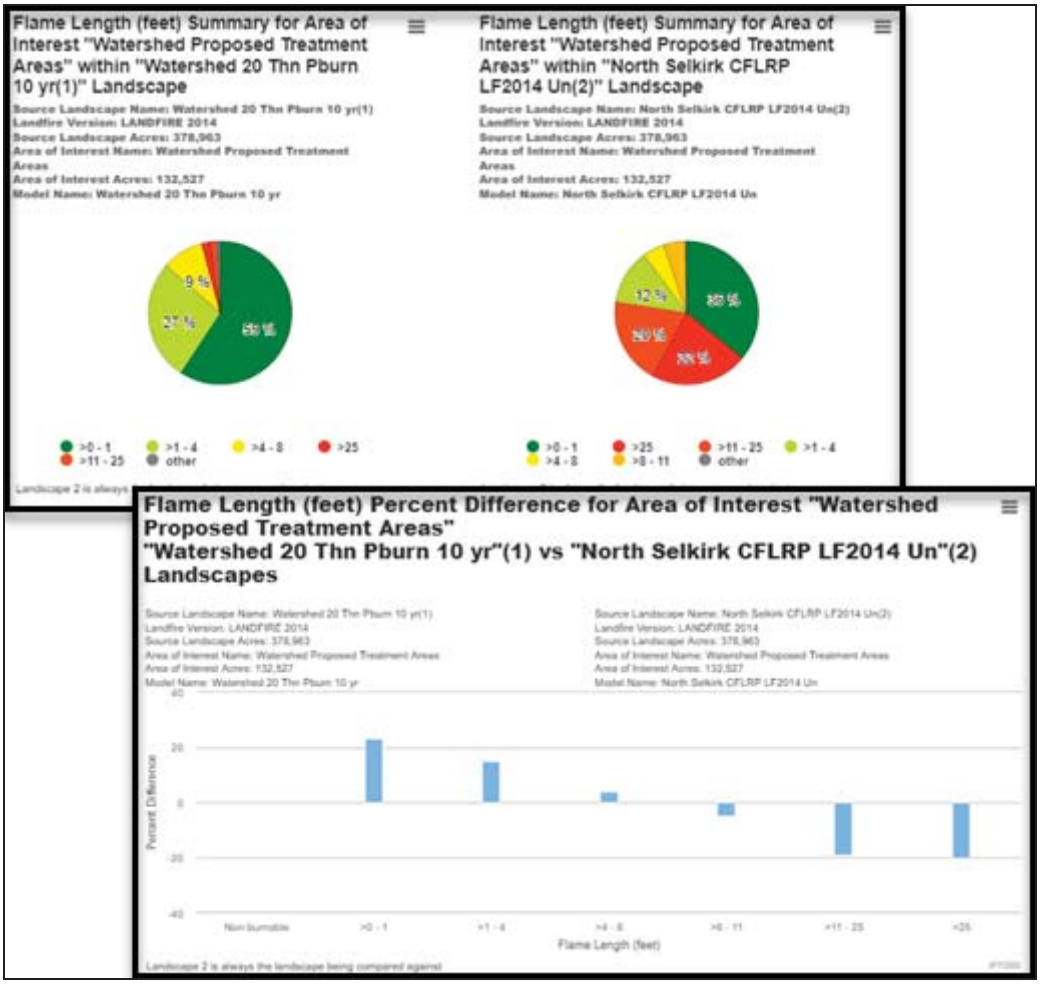
Source Landscape Name: North Selkirk CFLRP LF2014 Un(2)
Landfire Version: LANDFIRE 2014
Source Landscape Acres: 378,963
Area of Interest Name: Watershed Proposed Treatment Areas
Area of Interest Acres: 132,527
Model Name: North Selkirk CFLRP LF2014 Un

Copy | CSV | Excel | PDF | Print

Show 10 entries

Flame Length (feet)	Pixel Count Watershed 20 Thn Pburn 10 yr(1)/AOI	Pixel Count North Selkirk CFLRP LF2014 Un(2)/AOI	Acres Watershed 20 Thn Pburn 10 yr(1)/AOI	Acres North Selkirk CFLRP LF2014 Un(2)/AOI	Percent Watershed 20 Thn Pburn 10 yr(1)/AOI	Percent North Selkirk CFLRP LF2014 Un(2)/AOI
Non-burnable	1,889	1,889	420	420	0%	0%
>0 - 1	353,054	213,896	78,517	47,569	59%	36%
>1 - 4	161,836	73,772	35,991	16,407	27%	12%
						5%
						5%
						20%
						22%

The Percent Difference Graph for Flame Lengths demonstrates the shift towards lower Flame Lengths post-treatment. You can see the positive percent difference in the 0-1, 1-4, and 4-8 foot bins, while the bins correlating to higher Flame Lengths indicate a drop in the percent difference. The pie charts tell the same story, plainly showing the smaller sections of red/orange/yellow in the post-treatment chart.



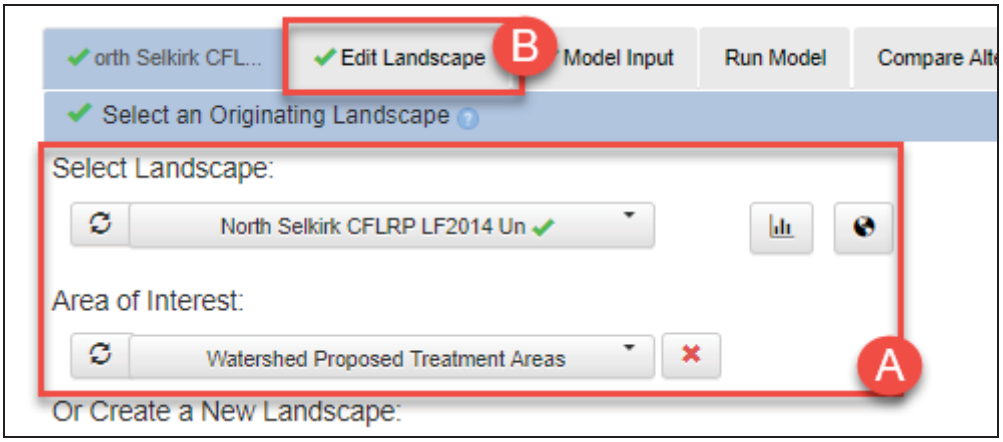
Scroll through the rest of the summary report to view the rest of fire behavior characteristics.

Adding an Additional Treatment to Treatment Alternatives

Now you'll look at the effects of applying a subsequent broadcast burn after the light thinning/pile burning. One of the initial objectives is to re-introduce low intensity fire in this area and it's an important step in treating this landscape. Additionally, you can see how this follow-up treatment will affect modeled fire behavior:

A. Navigate to the Develop Treatment Alternatives workflow again and select the same Originating Land-scape and AOI.

B. Navigate to the **Edit Landscape** tab.



C. This time, choose the landscape with your earlier edits as the Starting Landscape: "Watershed 20 Thn Pburn 10 yr"

D. Select **the Wildfire Default Rule**.

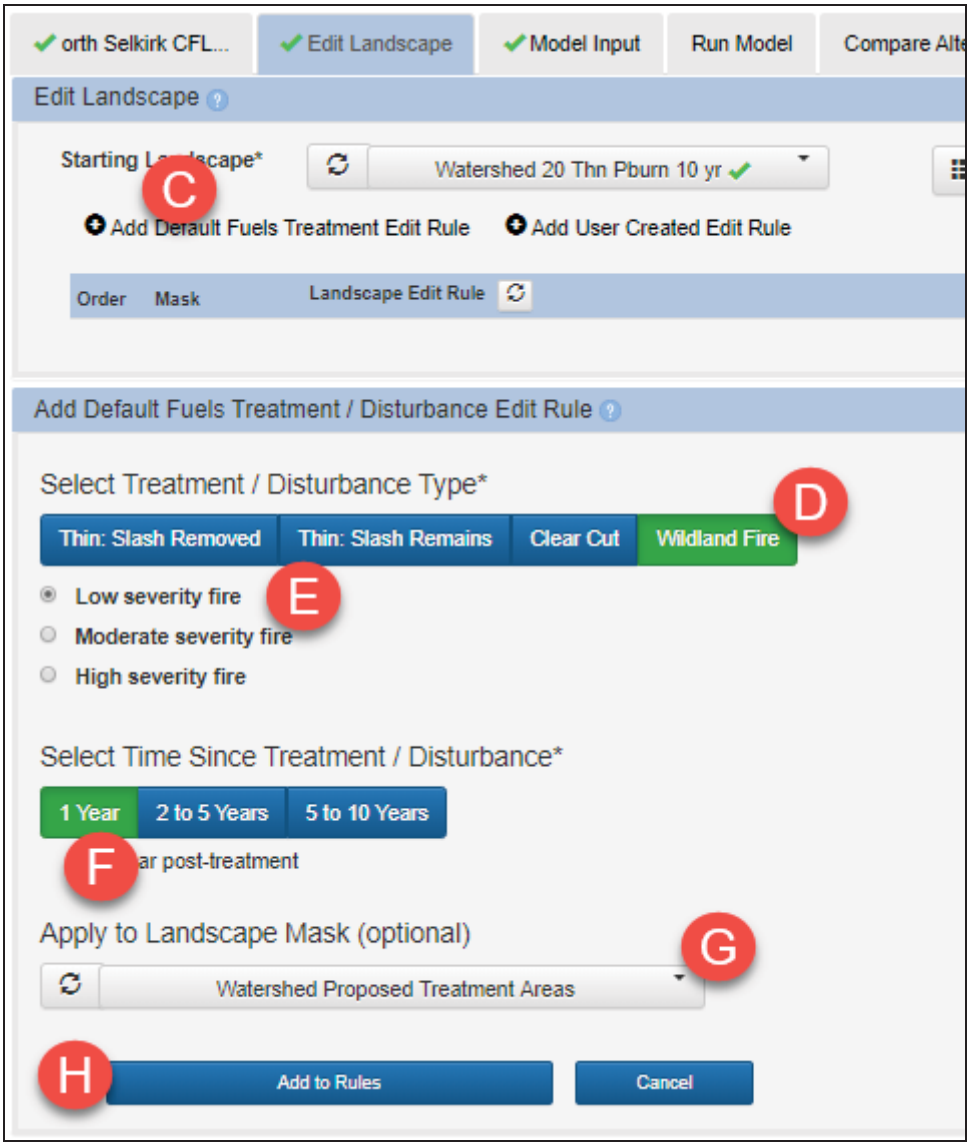
E. Specify **Low severity fire**. As before, you can hover over this text or consult Landscape Editing—Default Fuel Treatment and Disturbance for the detailed explanation of the rule.

F. Select a treatment time of 1 year

G. Apply this rule to your "Watershed Proposed Treatment Areas" mask.

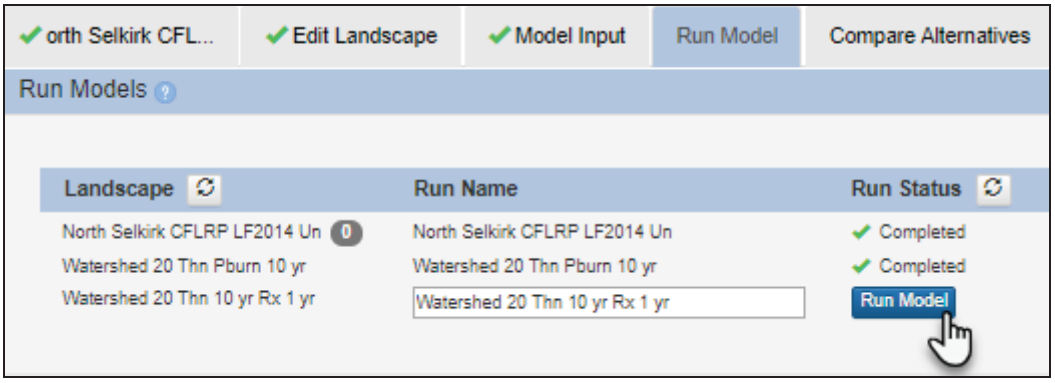
H. Click **Add to Rules**.

I. After the rule is added, give the landscape a detailed name (Watershed 20 Thn 10 yr Rx 1 yr) and click **Save New Landscape**.



Skip the Model Input tab this time. That input was saved from your last run, and the weather parameters must be kept constant in order to compare the results of the landscape changes.

Go to the **Run Model** tab and click **Run Model**. You may need to click the **Refresh** button next to Landscape if your edited landscape is still being built.



Next, move to the **Compare Alternatives** tab.

Compare the original landscape with this new one by selecting:

A. "Watershed 20 Thn 10 yr Rx 1 yr" as landscape "1".

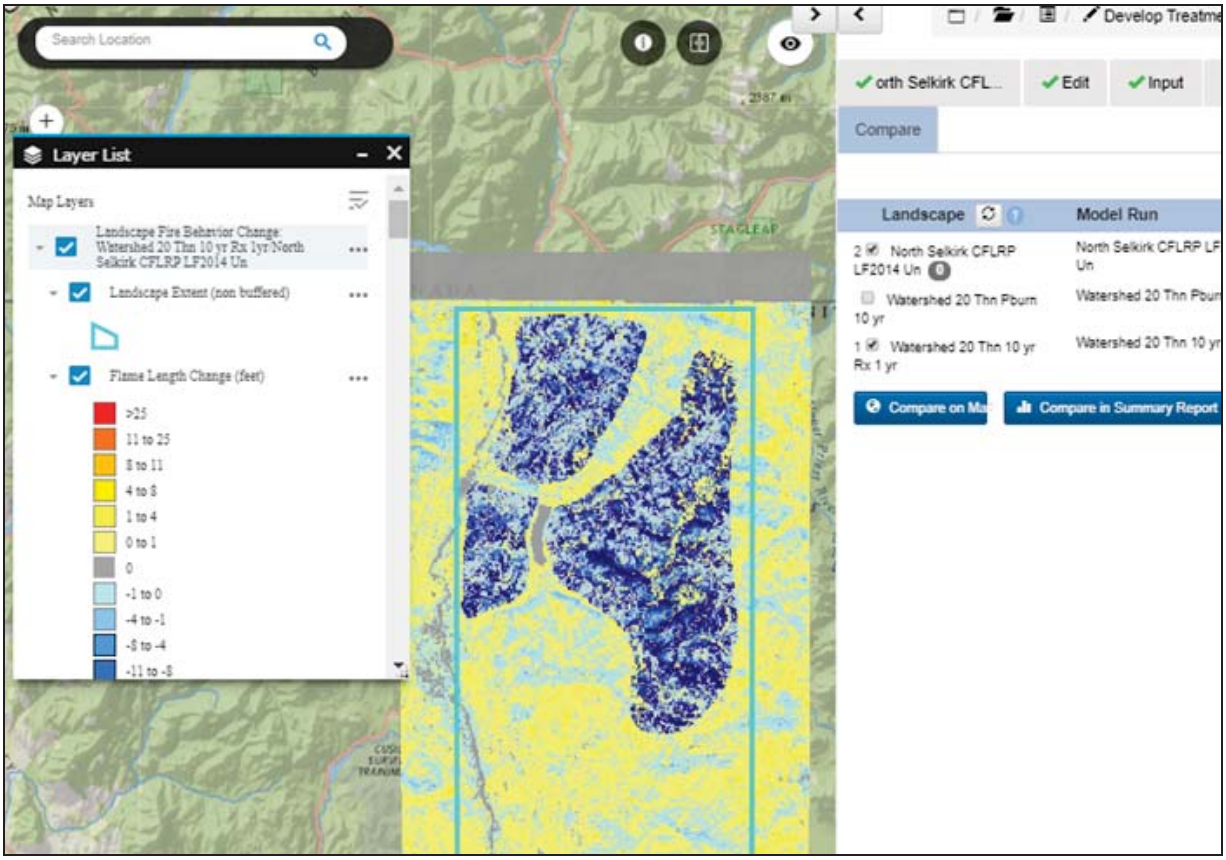
B. Select "North Selkirk CFLRP LF2014 Un" as landscape "2".

C. Click **Compare in Summary Report** and initiate those reports.

D. Click **Compare on map** to get a map view of your changes.

Section 7– Comparing Added Treatments and Concluding

As before, select the model change layer to evaluate flame length reduction. Now compare the original untreated landscape with this new treated landscape. What you'll really want to know is how much of an affect this added treatment of low severity wildfire, or a broadcast burn, will have compared to just the light thinning and pile burn applied earlier. You'll need to compare the first treatment to the second one to answer this.



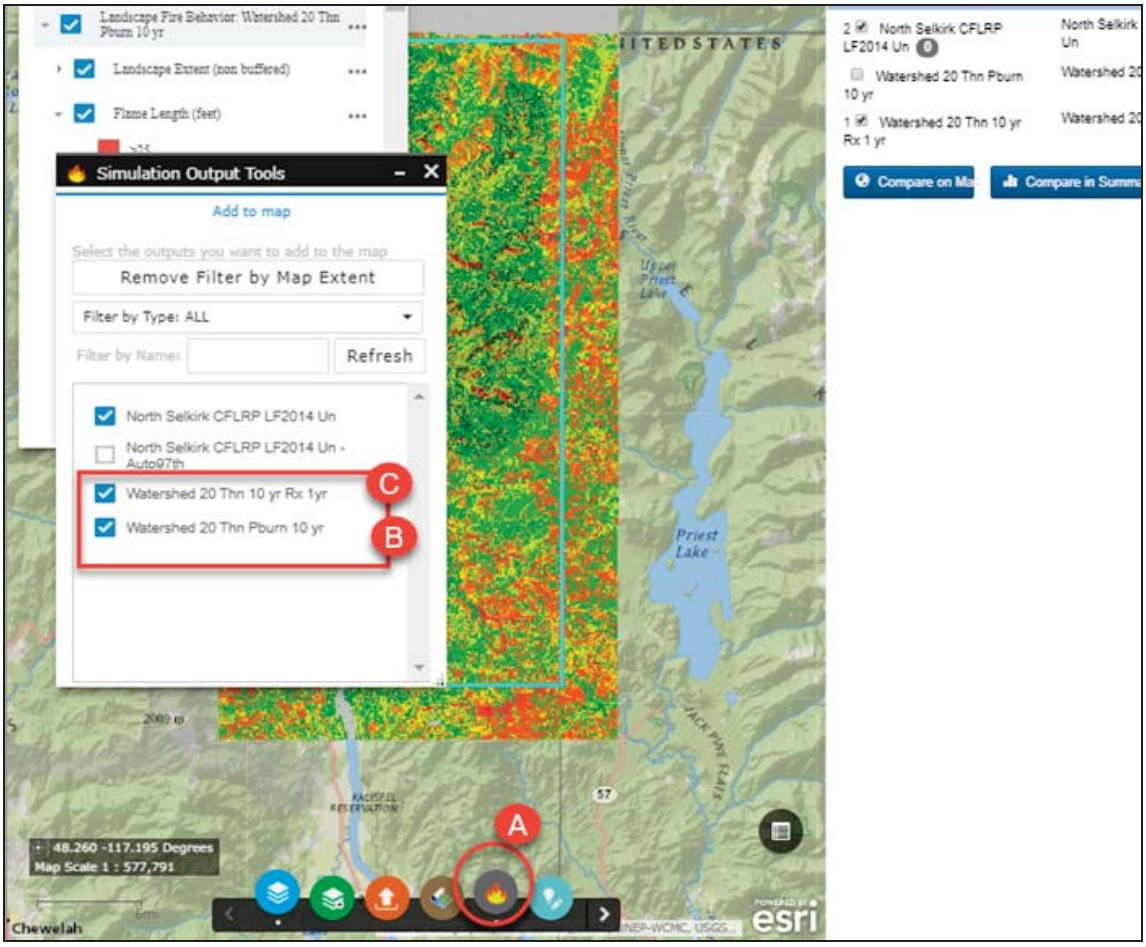
Swipe between layers

To compare these “treatments” (default disturbance edits) on the landscape, first use the **Swipe** widget:

A. Click **Simulation Output Tools** and check the boxes next to:

B. “Watershed 20 Thn Pburn 10 yr” the first treatment of thinning and pile burning.

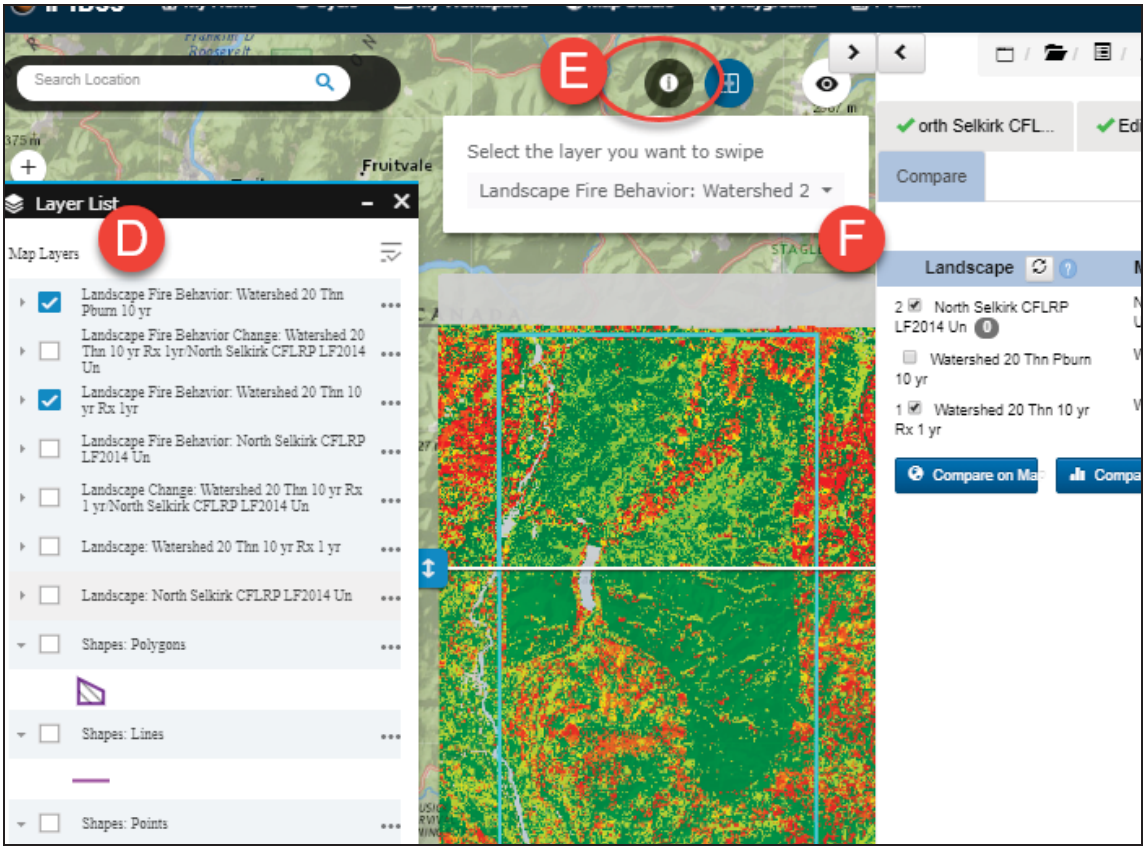
C. “Watershed 20 Thn 10 yr Rx 1 yr” the second treatment, which follows the thin with a low-severity burn.



D. In Layer List, check or uncheck the layers until only your landscapes of interest are displayed. In this example, “Watershed 20 Thn Pburn 10 yr” is shown on top, and “Model Output: Watershed 20 Thn 10 yr Rx 1 yr” is shown on the bottom.

E. Click the **Swipe** widget.

F. You can control the layers that appear in the **Swipe** widget using the box in the top right of the map that appears once the **Swipe** widget is clicked. The layer selected in this box is the layer that appears in the top half of the slider, and hidden on the bottom half.

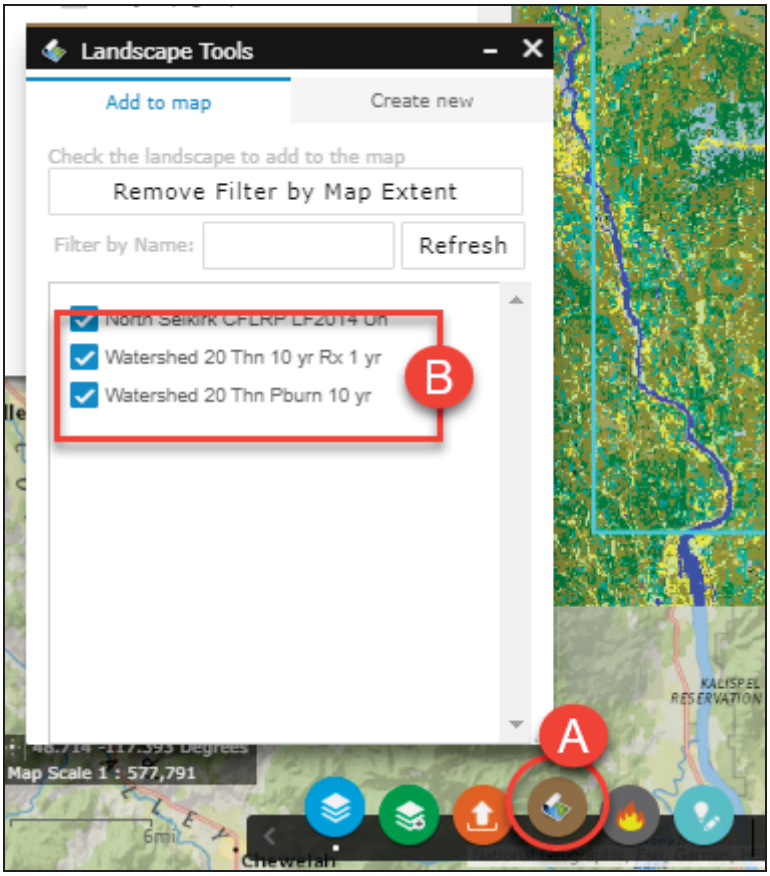


Swipe between the layers and compare: In this example, the light thin and pile burn is shown as the top swipe layer, followed by light thin, pile burn, and low severity wildfire (broadcast burn). Sliding back and forth and looking at the legend indicates that the Flame Lengths were in fact reduced by several feet in some areas with just the addition of the Low Severity Wildfire! Next, you'll want to see how the Fuel Models have changed with the addition of the Low Severity Wildfire.

Set the Layer List up again, this time opening:

A. **Landscape Tools** widget.

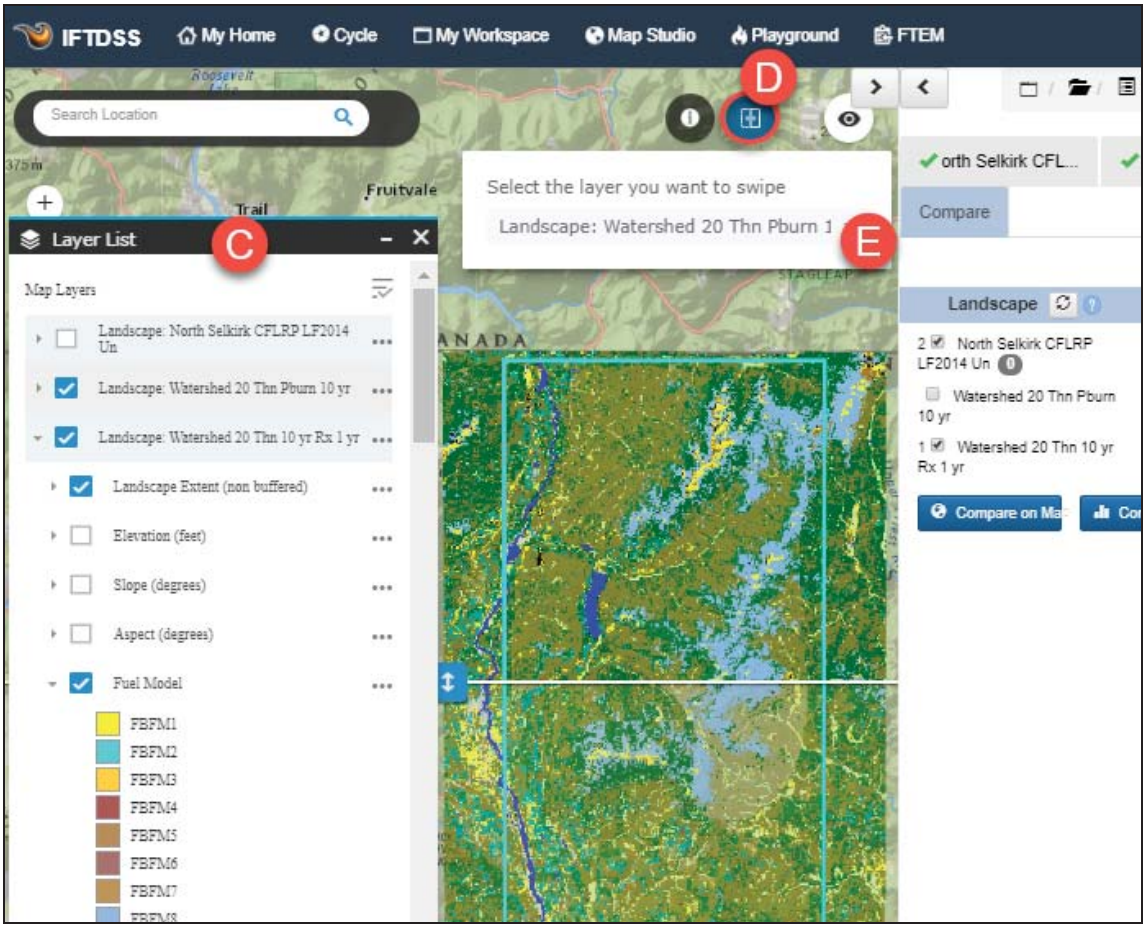
B. Select the two treatment layers.



C. Make sure these layers appear on the **Layer List** .

D. Click the **Swipe** widget.

E. Set the layers to swipe.



In comparing these two edited landscapes, as well as the landscape Change Map earlier, you see there was a significant shift in Fuel Model between the thinning/pile burn treatment and the addition of the low severity wildfire.

Review Summary Reports

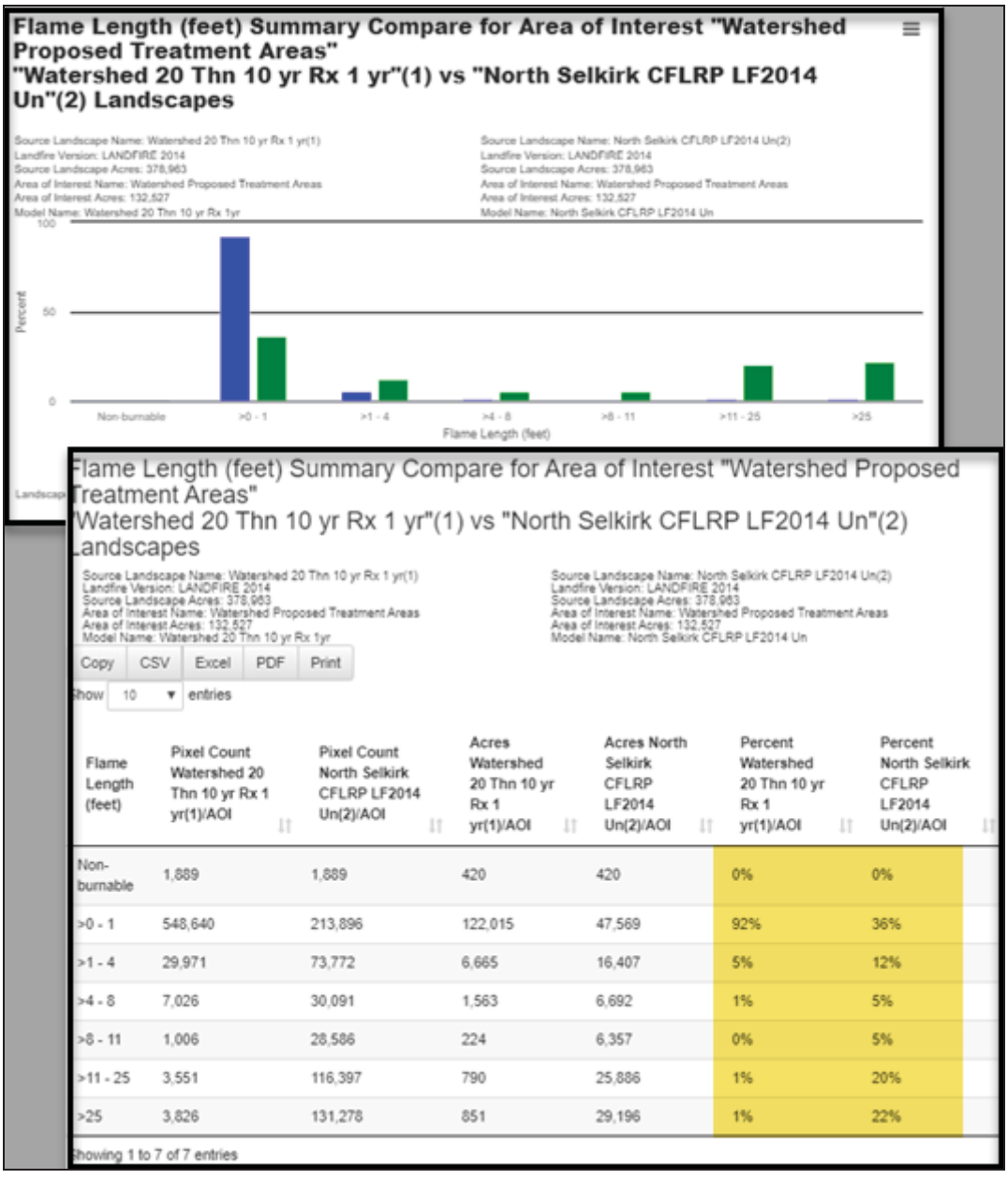
Next, open the **Compare Summary Reports** to get the full picture and make a more informed decision about what treatments should be applied to achieve the preliminary objectives.

Navigate to **My Workspace** and open the Fire Behavior Summary Compare Report.

The Fire Behavior Compare Reports for a modeled Light Thin/Pile Burn/ Low Severity Broadcast Burn treatment show even more of a difference in pre– and post–treatment fire behavior.

The Flame Length bar chart shows a large increase in the post-treatment acreage for lower Flame Length bins and no post-treatment acres in the higher Flame Length bins.

The table indicates the pre– treatment percentage of pixels in the >0-1 foot Flame Length bin is 36%, while post-treatment, the percentage went up to 92%. The table also indicates that the percentage of post-treatment pixels were drastically decreased for all of the Flame Length categories but the >0-1 feet.



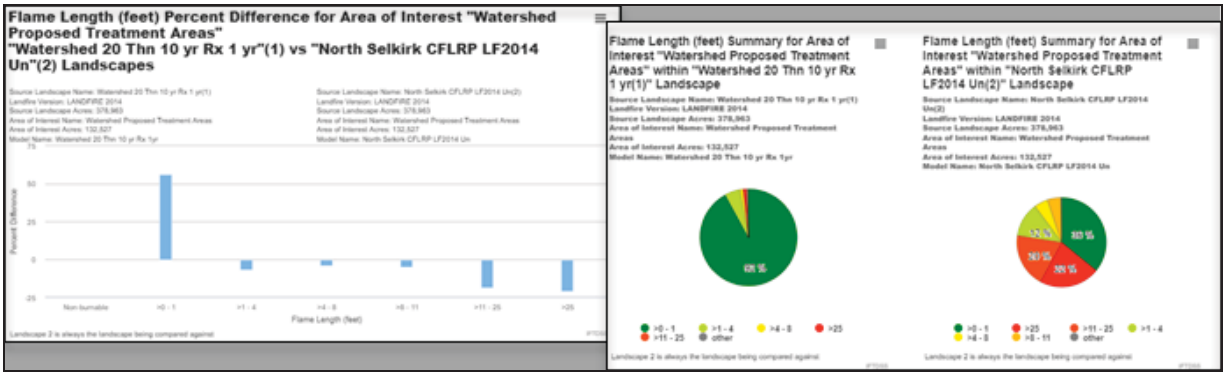
Flame Length (feet)	Pixel Count Watershed 20 Thn 10 yr Rx 1 yr(1)/AOI	Pixel Count North Selkirk CFLRP LF2014 Un(2)/AOI	Acres Watershed 20 Thn 10 yr Rx 1 yr(1)/AOI	Acres North Selkirk CFLRP LF2014 Un(2)/AOI	Percent Watershed 20 Thn 10 yr Rx 1 yr(1)/AOI	Percent North Selkirk CFLRP LF2014 Un(2)/AOI
Non-burnable	1,689	1,689	420	420	0%	0%
>0 - 1	548,640	213,896	122,015	47,569	92%	36%
>1 - 4	29,971	73,772	6,665	16,407	5%	12%
>4 - 8	7,026	30,091	1,563	6,692	1%	5%
>8 - 11	1,006	28,586	224	6,357	0%	5%
>11 - 25	3,551	116,397	790	25,886	1%	20%
>25	3,826	131,278	851	29,196	1%	22%

Showing 1 to 7 of 7 entries

The Percent Difference Graph for Flame Lengths demonstrates the shift toward lower Flame Lengths post-treatment. You can see the significant positive percent

difference in the >0-1 foot bins, while the bins correlating to higher Flame Lengths indicate a drop in the percent difference.

The pie charts tell the same story, showing the shift to significantly lower flame lengths post-treatment.



Scroll through the rest of the fire behavior model outputs in the report. Their story is the same, significantly reduced Rates of Spread, as well as almost no Crown Fire Activity post-treatment.

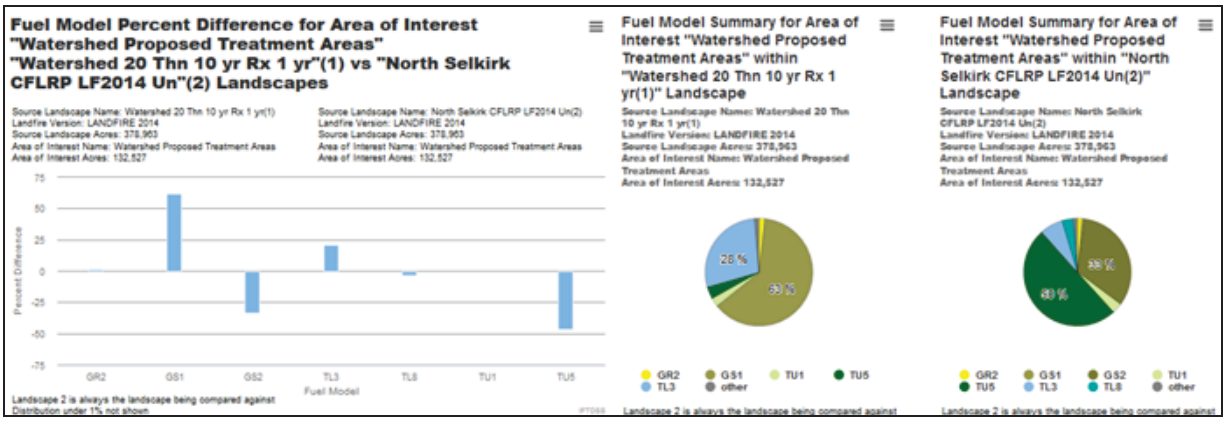
Next, navigate back to **My Workspace** and open the Landscape Compare Summary Report.

The Landscape Compare Reports for a modeled Light Thin/Pile Burn/Low Severity Broadcast Burn treatment show quite a change in Fuel Model pre– vs. post-treatment.

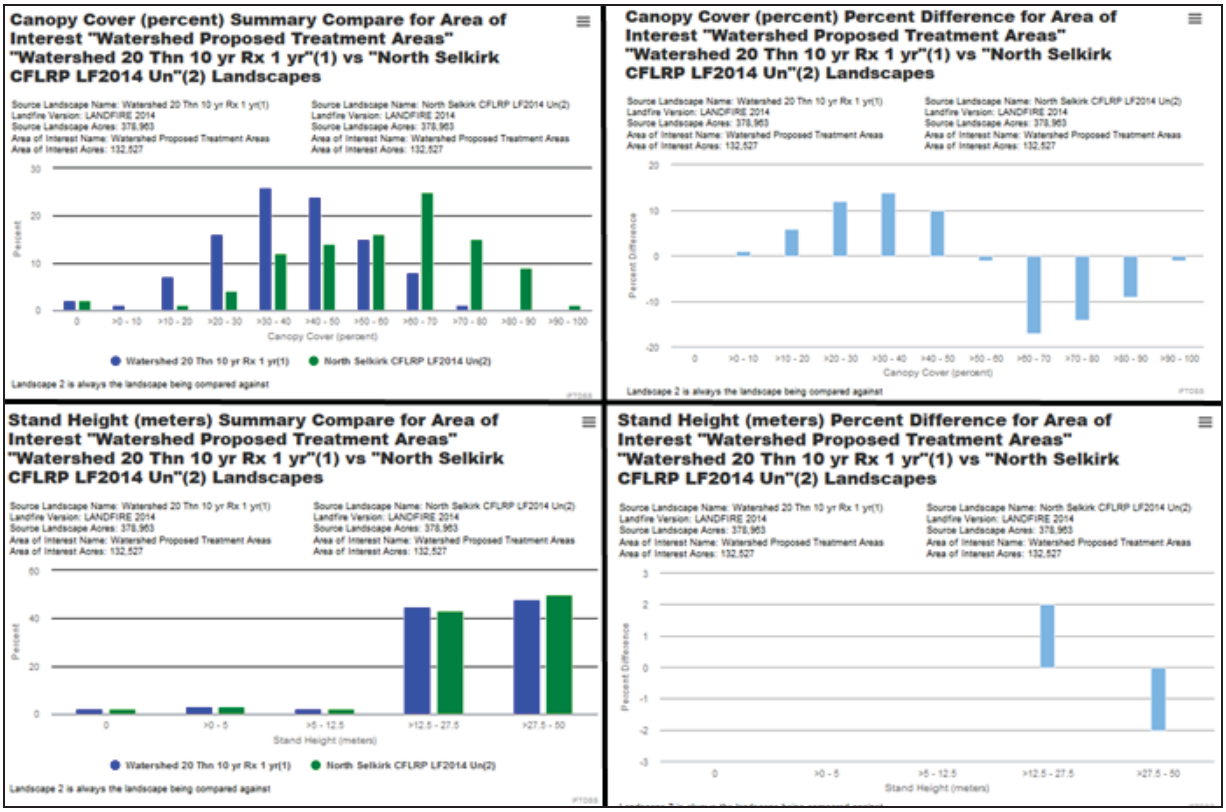
From the compare bar graph, you can tell that a significant portion of the TU5 Fuel Model (Very High Load, Dry Climate Timber-Shrub) has shifted to GS1 (Low Load, Dry Climate Grass-Shrub). The table further confirms this quantitatively, indicating that 50% of the treatment area was comprised of a TU5 Fuel Model pretreatment, while just 4% of the treatment area was a TU5 Fuel Model post-treatment. Conversely, 1% of the treatment area contained the GS1 Fuel Model pretreatment, while post-treatment, 63% of the treatment area was comprised of Fuel Model GS1.

The Percent Difference chart reflects the shift in Fuel Model displayed by the bar graph and table above, clearly showing the drop in the TU5 Fuel Model, as well as the increase in the GS1 Fuel Model post-treatment.

The pie charts visually display these changes in Fuel Model as well.



Review the rest of the Landscape Compare Summary Report and note the changes in the various landscape characteristics. Pay close attention to the increase in Canopy Base Height, as well as the decrease in Canopy Cover, post-treatment. This coincides with the information you see in the rest of the report, and justifies the fact that this series of treatments will help achieve the stated objectives for this North Selkirk study area.



Conclusion

Based on Forest Plan direction and the CFLRP proposal guidelines, the preliminary results of this study show that we are meeting our objectives for the North Selkirk Project Areas, which are to:

- Recommend hazardous fuels treatments that can occur through this project to: Reduce the risk of uncharacteristic wildfire and/or re-establish or maintain low-severity fire regimes; reduce surface fuel loading and the overall horizontal and vertical fuel bed continuity to reduce the fire hazard to adjacent private, Tribal, and State land; and return low intensity fire to fire adapted vegetation communities.
- Locate areas where our actions will be most effective.
- Evaluate what type of treatment will help achieve these objectives.

- Describe why the treatment acres were chosen. Why here? Why now? What risk assessment did you use to identify these areas, e.g. wildfire hazard potential map or regional risk assessment, forest-wide risk assessment, etc.
- Demonstrate the need for treatment, both quantitatively and spatially, to members of your Forest Natural Resources Staff Officer and district interdisciplinary (ID) team.

This study was modeling more extreme fire behavior, given 97th percentile fire weather and fuel moisture conditions used, than the low-intensity/moderate-sever-ity fire the study area typically sees in this portion of the Colville National Forest. This will help to justify future treatments during increasingly dry and hot sea-sons predicted for the future. You have set the foundation for a good report to give to your FLT and, if necessary, can go back and test out different treatment methods, such as a heavier thinning or increased mortality from a more severe broadcast burn.