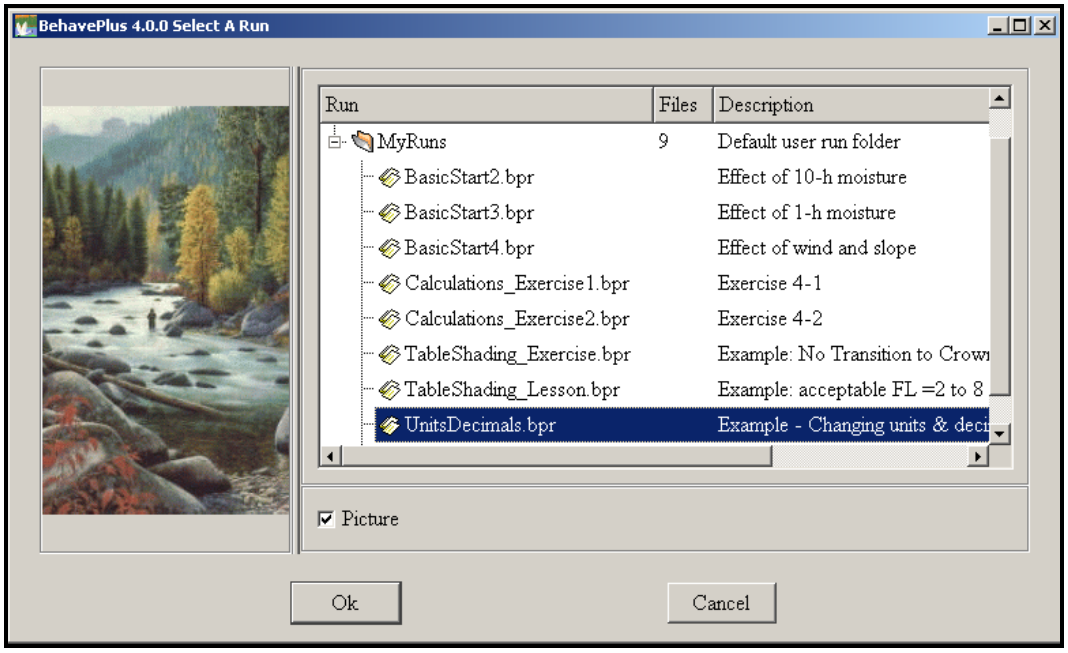
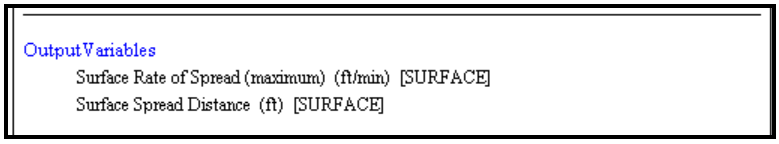
Exercise Answers

1. Open the run that you saved in the lesson, called "UnitsDecimals".

- Click on **File > Open Run** or .
- Click on the **+** next to **MyRuns**.
- Double-click on **UnitsDecimals.bpr** or click on it and then click **Ok**.



- Look at the **Output Variables** Section; Surface Spread Distance is in units of feet.



- **Change the units for Spread Distance to miles (mi) with one decimal place.**

- Open the **Units Editor** by clicking on **Configure > Custom units preference**.
- Click on the **Fire & Effects Units** tab.

- Change the Spread Distance Units to miles (mi) and Decimals to 1.
- Click **Ok**.
- Click **NO**; don't save the Custom Units Set.

The outputs should now look like this.

Output Variables

Surface Rate of Spread (maximum) (ft/min) [SURFACE]

Surface Spread Distance (mi) [SURFACE]

- Calculate the run.

The results should look like this.

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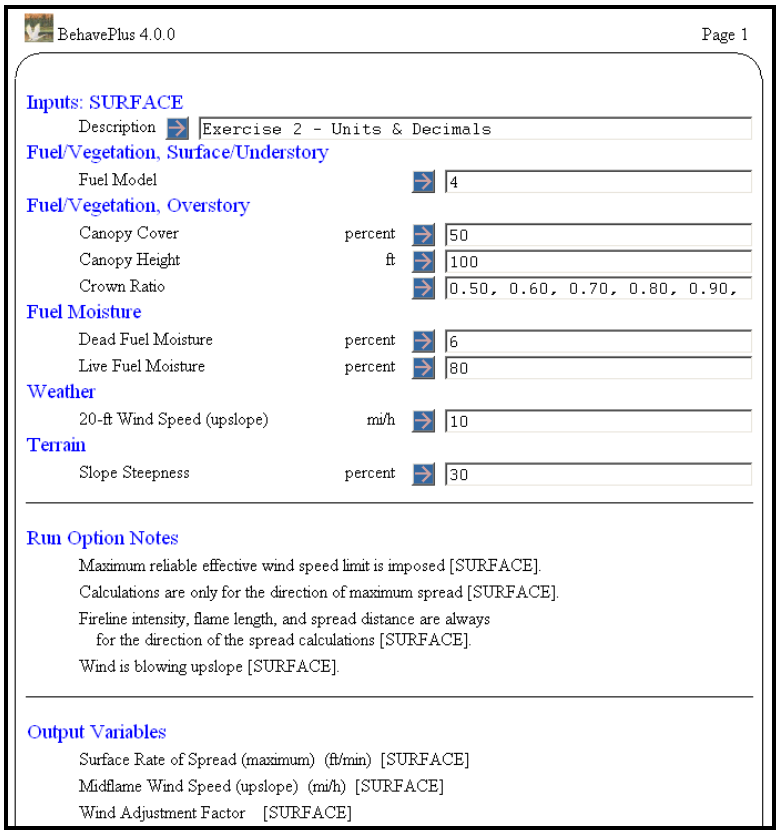
Example - Changing units & decimals

Midflame Wind Speed mi/h	ROS (max) ft/min	Spread Distance mi
0.0	19	0.2
2.0	44	0.5
4.0	86	1.0
6.0	139	1.6

- Save the run as "UnitsDecimals_Exercise1".
- Close the worksheet before starting Exercise 2.

2. Open the Example Worksheet SurfaceSimple.bpw. Develop a worksheet that looks like this (Crown Ratio ranges from 0.50 to 1.00).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Inputs: SURFACE
Description: Exercise 2 - Units & Decimals
Fuel/Vegetation, Surface/Understory
Fuel Model: 4
Fuel/Vegetation, Overstory
Canopy Cover (percent): 50
Canopy Height (ft): 100
Crown Ratio: 0.50, 0.60, 0.70, 0.80, 0.90,
Fuel Moisture
Dead Fuel Moisture (percent): 6
Live Fuel Moisture (percent): 80
Weather
20-ft Wind Speed (upslope) (mi/h): 10
Terrain
Slope Steepness (percent): 30

Run Option Notes
Maximum reliable effective wind speed limit is imposed [SURFACE].
Calculations are only for the direction of maximum spread [SURFACE].
Fireline intensity, flame length, and spread distance are always for the direction of the spread calculations [SURFACE].
Wind is blowing upslope [SURFACE].

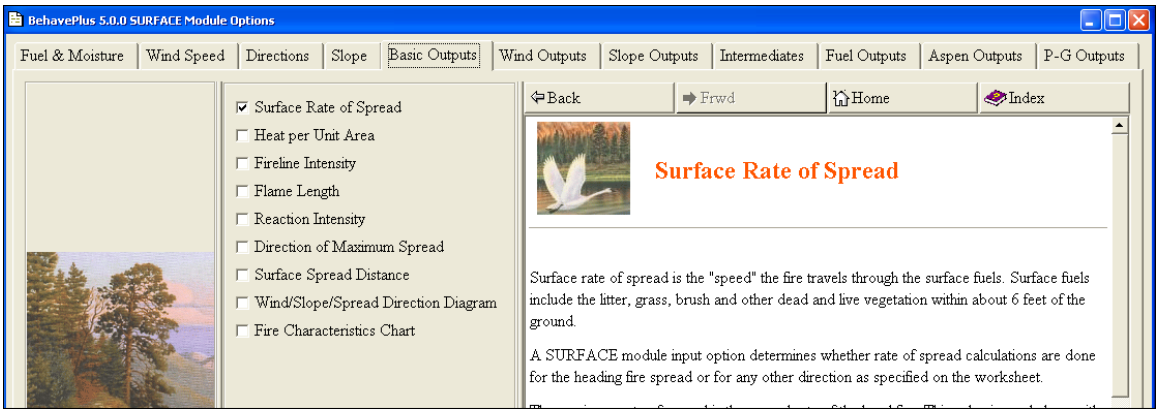
Output Variables
Surface Rate of Spread (maximum) (ft/min) [SURFACE]
Midflame Wind Speed (upslope) (mi/h) [SURFACE]
Wind Adjustment Factor [SURFACE]

- Click on **File > Open Worksheet** or .
- Click on the **+** next to **ExampleWorksheets**.
- Double-click on **SurfaceSimple.bpw** or highlight it and click **Ok**.
- Enter the description "Exercise 2 – units & decimals" and Fuel Model 4.

You need to change some options before you continue.

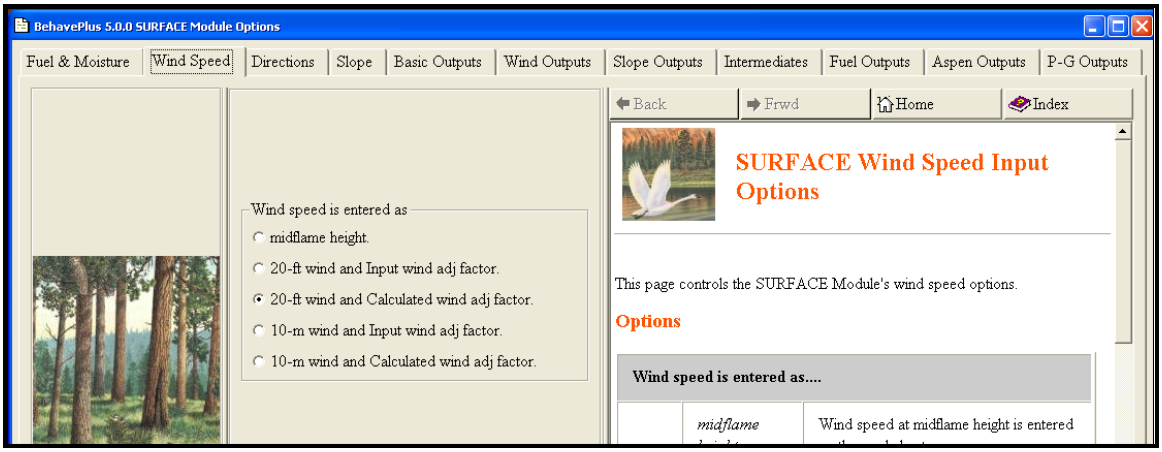
- Open the **Module Selection** dialog box ( ).
- Click on **SURFACE Options…** to open the **SURFACE Module Options** dialog box.

- On the **Basic Outputs** tab, change the outputs so that only the Surface Rate of Spread.



- On the **Wind Outputs** tab, change the outputs so that only Midflame Wind Speed, and Wind Adjustment Factor are selected.

- Open the **Wind Speed** tab.
- Change the **Wind speed is entered as** to **20-ft wind and Calculated wind adj factor**.



- Click **Ok** to close the **SURFACE Options…** dialog box.
- Click Ok to close the **Module Selection** dialog box.

Notice that the Canopy Height and Crown Ratio are blue, indicating they are not needed unless you enter a Canopy Cover value greater than zero. When you enter the value for the Canopy Cover, they will change to white, indicating you must enter values.

- Enter values into the boxes per the sample worksheet.
- When you get to Crown Ratio, click on the guide button. Enter the following: **From** 0.5 **Thru** 1.0 **Step** 0.1.

- Check the **Output Variables**. Surface Rate of Spread is in ch/h, but the sample worksheet has units of ft/min. This needs to be changed.

Output Variables
Surface Rate of Spread (maximum) (ch/h) [SURFACE]
Midflame Wind Speed (upslope) (mi/h) [SURFACE]
Wind Adjustment Factor [SURFACE]

- Click on **Configure > Units set selection > Custom**.
- Click on the **+** by **MyUnitsSets**. Highlight the Units Set created as part of the lesson (**NoChains.bpu**). Click **Ok**.
- Look at the **Output Variables** again. The units for Surface Rate of Spread have changed to ft/min.

Output Variables
Surface Rate of Spread (maximum) (ft/min) [SURFACE]
Midflame Wind Speed (upslope) (mi/h) [SURFACE]
Wind Adjustment Factor [SURFACE]

- Calculate the run.
- The resulting table should look like the following.

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Exercise 2 - units & decimals

Crown Ratio fraction	ROS (max) ft/min	Midflame Wind Speed mi/h	Wind Adj Factor
0.5	33	1.3	0.13
0.6	31	1.2	0.12
0.7	30	1.1	0.11
0.8	29	1.0	0.10
0.9	28	1.0	0.10
1.0	27	0.9	0.09