# Example Using Engine Response Feature

The "Engine Response" feature in WFIPS allows for distinguishing between the different engine sizes and their varied ability to traverse forest roads. This example illustrates how the differing capabilities of Type 3 and Type 6 engines at the Lake Tahoe Basin Management Unit can be included in the WFIPS analysis. An engine response polygon file is used to divide the analysis area into regions where the different engine types can travel and regions where engine crews must walk into the fire. Optionally walk-in distance grids can be provided for the different engine types. The specified travel rate in miles per hour is used to calculate the time it will take for engine crews from the different engine types to travel to the each fire to be analyzed.

During a WFIPS run if a fire occurs in one of the areas covered by the engine response polygon the "EngType" value from the polygon file is used to determine how the engines will be deployed and how to calculate the time the engines/crews will begin constructing fireline. If the fire does not occur in one of the covered areas the "standard" dispatch logic and arrival time calculation will be used. The "EngType" value indicates the largest engine type that can drive to the fire. In our example both Type 3 and Type 6 engines can drive to fires that occur in polygons labeled "3". Only Type 6 engines can drive to fires that occur in polygons labeled "6". Type 3 engines deployed to these fires deliver crews that have to walk into the fires from a road the Type 3 engines can traverse. If the "EngType" value is "0" then all engines will deliver crews that have to walk into the fire. If Walk-In Distance Grids are provided, different walk in distances can be used for the different engine types reflecting how close each type can get to the fire. If the Walk-In Distance Grids are not provided for the engine type the "standard" WFIPS 2k walk-in delay value is used. (The standard walk-in delay for engines can be viewed using View>>Raster Layers>>Walk In Engine. In the case of the Lake Tahoe Basin Management Unit most of the area has a walk_in time of 5 minutes with a few areas where the time is 30 minutes.)
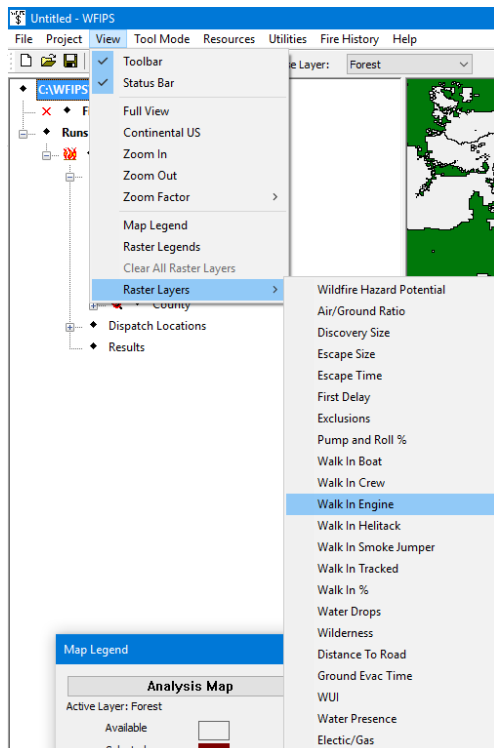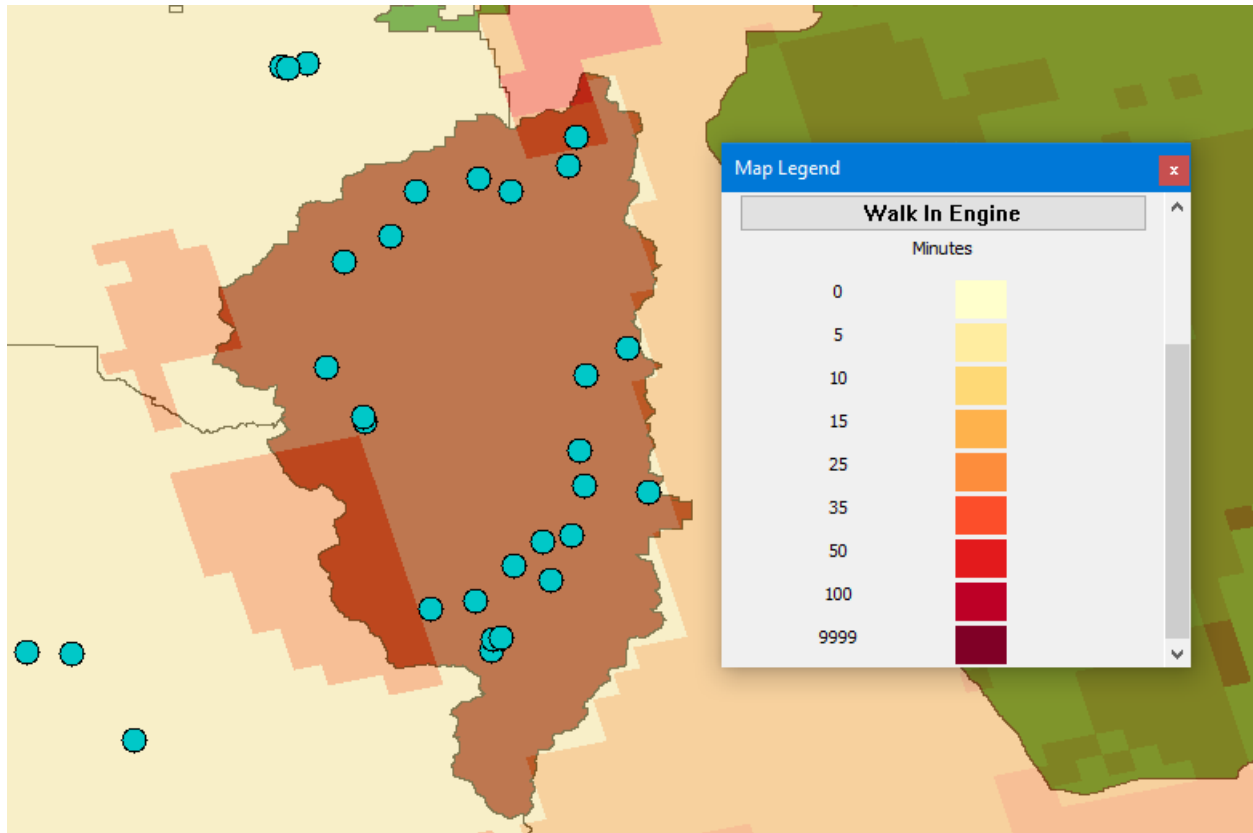
The Engine Response Polygon file is used to divide the analysis area into regions where the different engine types can drive to fires and where crews from the engines must walk into the fires. The polygons must contain an integer field named "EngTyp" that represents the largest engine type that can drive to the area. An "EngType" 0 indicates that no engines can drive to the area.

Values for EngType:

0 – All engines walk-in

1 – Type 1 thru Type 7 engines can drive to this area

3 – Type 3 thru Type 7 engines can drive to this area Type 1 and Type 2 engines walk-in

4 – Type 4 thru Type 7 engines can drive to this area Type 1 thru Type 3 engines walk-in

5 – Type 5 thru Type 7 engines can drive to this area Type 1 thru Type 4 engines walk-in

6 – Type 6 and Type 7 engines can drive to this area Type 1 thru Type 5 engines walk-in

7 –Type 7 engines can drive to this area Type 1 thru Type 6 engines walk-in

WFIPS T6 / T3 Access
Access Data
from LTBMU

0 0.75 1.5   3   4.5   6
                                  Miles

Legend

TMU_Roads
Engine_Typ
——— 0
——— 3
——— 6

Engine_Response_Area
Engine_Typ
  0
  3
  6

Optionally Walk-In Distance Grids for the engine types can be used to specify the walk-in distances from the nearest road the engine type can drive. WFIPS used combined engine types so grids for engine Types 1 or 2 (EN12), 3 or 4 (EN34), 5 or 6 (EN56), and engine Type 7 (EN70) can be entered. Not all engine type grids have to be provided. If a grid for the engine type is not provided the "standard" WFIPS 2k engine walk-in delay will be used.
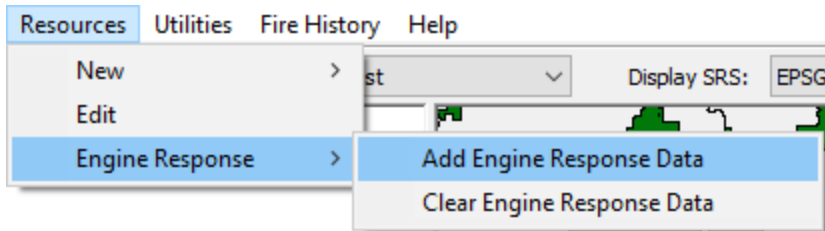
Walk-In Distance Grid for Type 3 Engines:
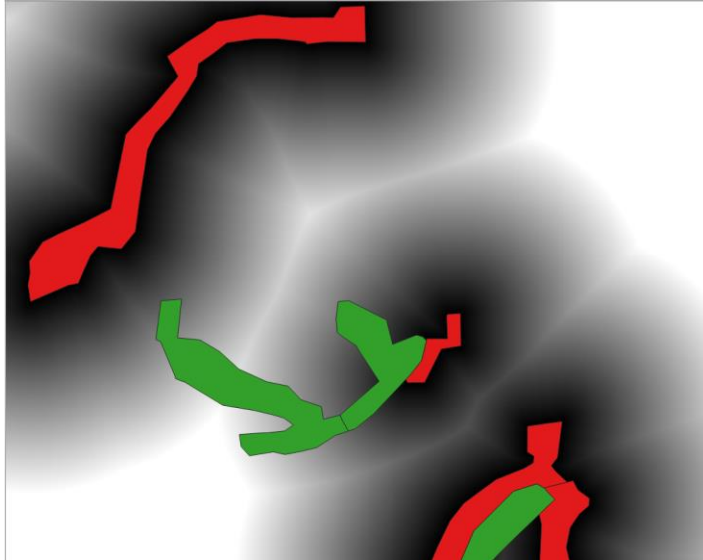
Walk-In Distance Grid for Type 3 Engines:
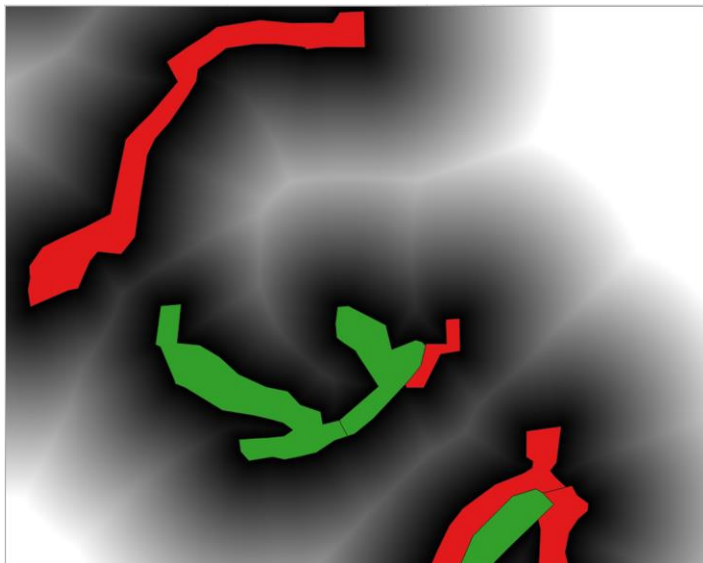
The Spatial information is entered under the Resources Menu item: Resources>>Engine Response>>Add Engine Response Data. The Engine Response data in WFIPS can be cleared using Resources>>Engine Response>> Clear Engine Response Data.

The appropriate spatial files are entered into the Engine Response Processing dialog. Since Type 7 engines can be deployed to fires in the Lake Tahoe Basin Management Unit and because the "standard" walk_in delay is often 5 minutes, the Type 6 engine Walk_In distance grid was entered for EN70 so these engines to provide more reasonable delays for Type 7 engines. "Walk-in rate (mph)" defaults to 2.0 miles per hour, but can be adjusted to reflect conditions in the area.
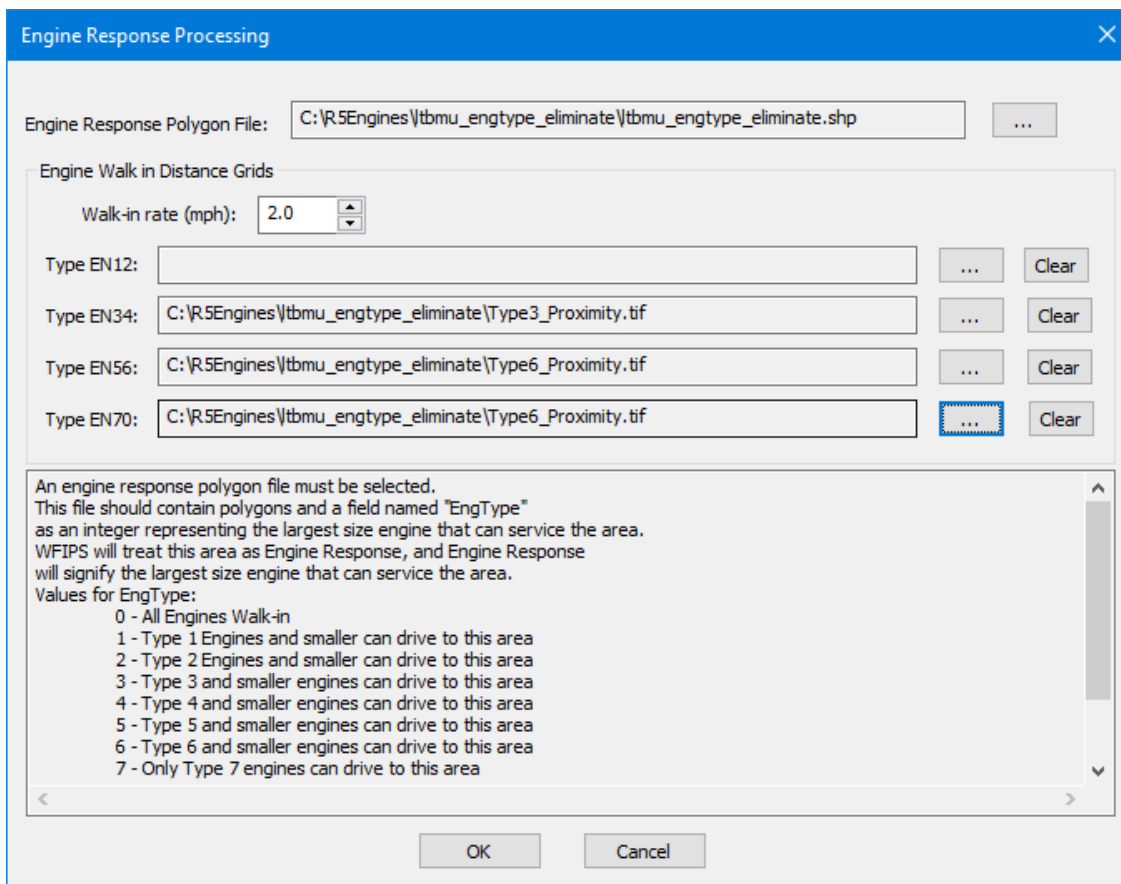
Click "OK" and the spatial information will be processed. The number of records updated and appended are indicated when the process is complete.
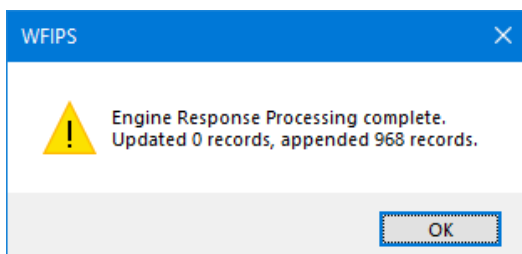
Your WFIPS databases have been modified with the engine response information and the changes will remain until they are cleared. Additional modifications can be added for different areas and the existing engine response information can be updated using the same process. All future runs on your computer will use this updated Engine Response information, unless it has been cleared. The number of fires that are affected by the Engine Response information is provided in the "Run Summary".

Excluded Resources:

- None

Fires Using Updated Engine Response: 935

Summaries

Year	Fires	Acres	Treat Acres	Non-Treat Acres	No Resources Sent	Contained
1992	47	33.9	0.0	33.9	0	47
1993	5	0.5	0.0	0.5	0	5

(Note: if you want the ability to run both with and without the Engine Response information, enter all the spatial information, make a copy of "historicalfig.db" found in your data file and rename it as you wish; run WFIPS and clear the Engine Response information. When you want to use the Engine Response information select the appropriate "Fires Database" for the run.)

Run : Run 1

General Resources Fuel Treatments Step Series

Run Name: Run 1

Fire Ignitions

Fires Databse: C:\WFIPS\data\historicalfigEng.db [...]

Years

☑ 1992   ☑ 1997   ☑ 2002   ☑ 2007