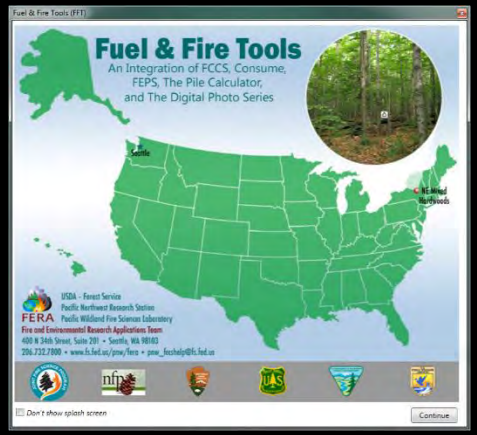
FCCS & Consume Exercises

Using Fuel and Fire Tools- FFT

White spruce insect damage



FFT Exercise

White spruce

White Spruce
Insect damage

Difference??

Step 1: Find a representative fuel bed:

- Open the Fuel and Fire Tools (FFT)
- Select the Baileys ecoregion (subartic 130)
- Select vegetation form (conifer)
- Search for fuelbeds

Fuel & Fire Tools (FFT)

Fuel & Fire Tools

An Integration of FCCS, Consume,
FEPS, The Pile Calculator,
and The Digital Photo Series

USDA - Forest Service
Pacific Northwest Research Station
Pacific Wildland Fire Sciences Laboratory
FERA
Fire and Environmental Research Applications Team
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206.732.7800 • www.fs.fed.us/pnw/fera • pnw_fccshelp@fs.fed.us

Don't show splash screen

Continue

1. Select from the list below. Filter list of all fuelbeds by: Clear all filters

Ecoregion: Subarctic

Vegetation Form: Conifer Forest

Cover Type:

Structural Class:

Change Agent:

2. Browse your file system to select fuelbed (.xm LANDFIRE fuelbed list (.lf) files:

Browse to file(s)...

3. Load a saved unit:

Duluth | 1000 | 2 fuelbed(s)

List of all fuelbeds:7 *Right-click on selected fuelbed to make copies*

85: Black spruce/lichen forest
87: Black spruce/feathermoss forest
88: Black spruce/sphagnum moss forest
89: Black spruce/cottonsedge woodland
91: White spruce/prickly rose forest
101: White spruce forest
102: White spruce forest with beetle damage

Selected Fuelbeds:

Save/edit this unit

Delete this unit

Start over/ Create new unit

Help

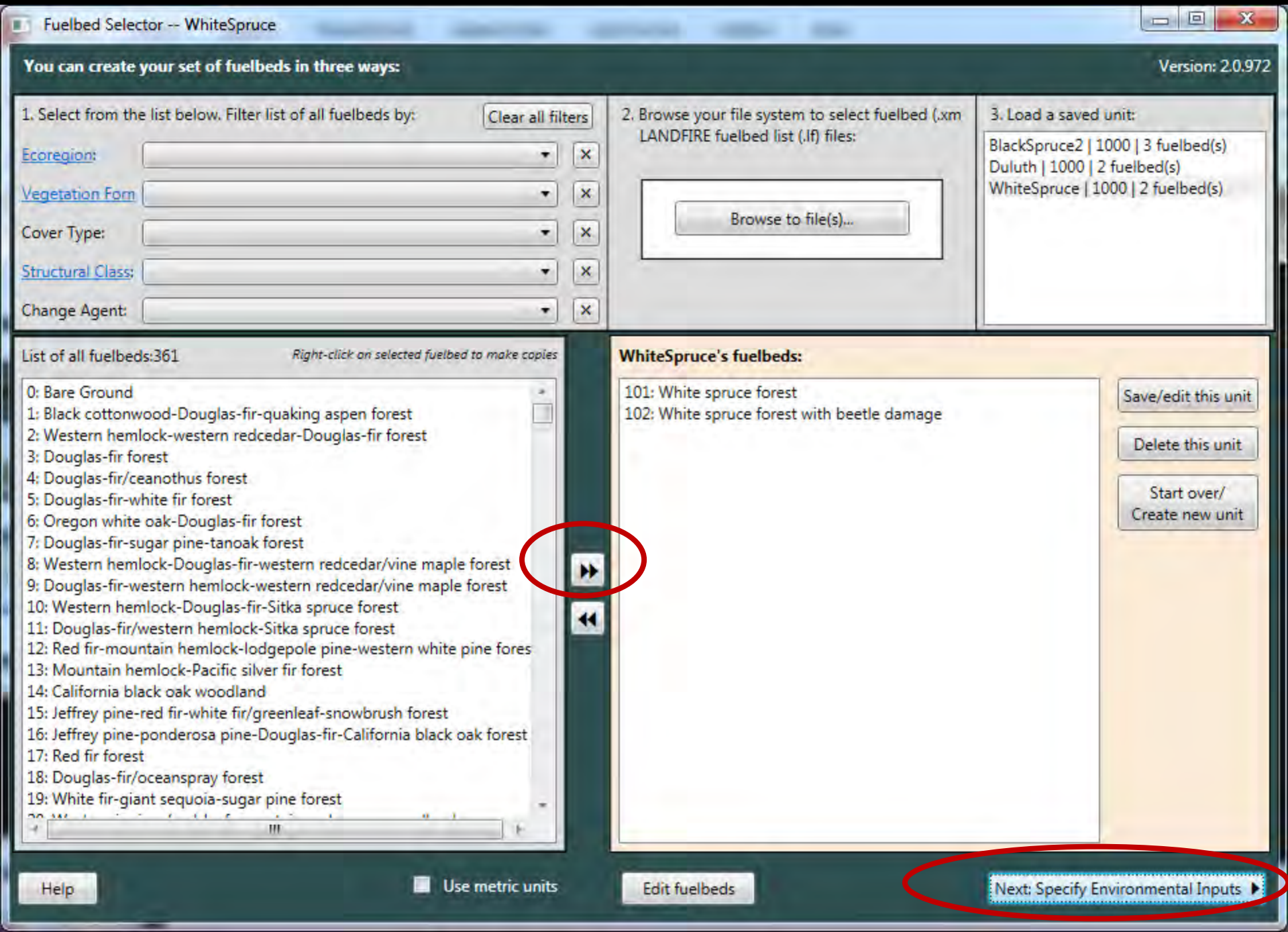
Use metric units

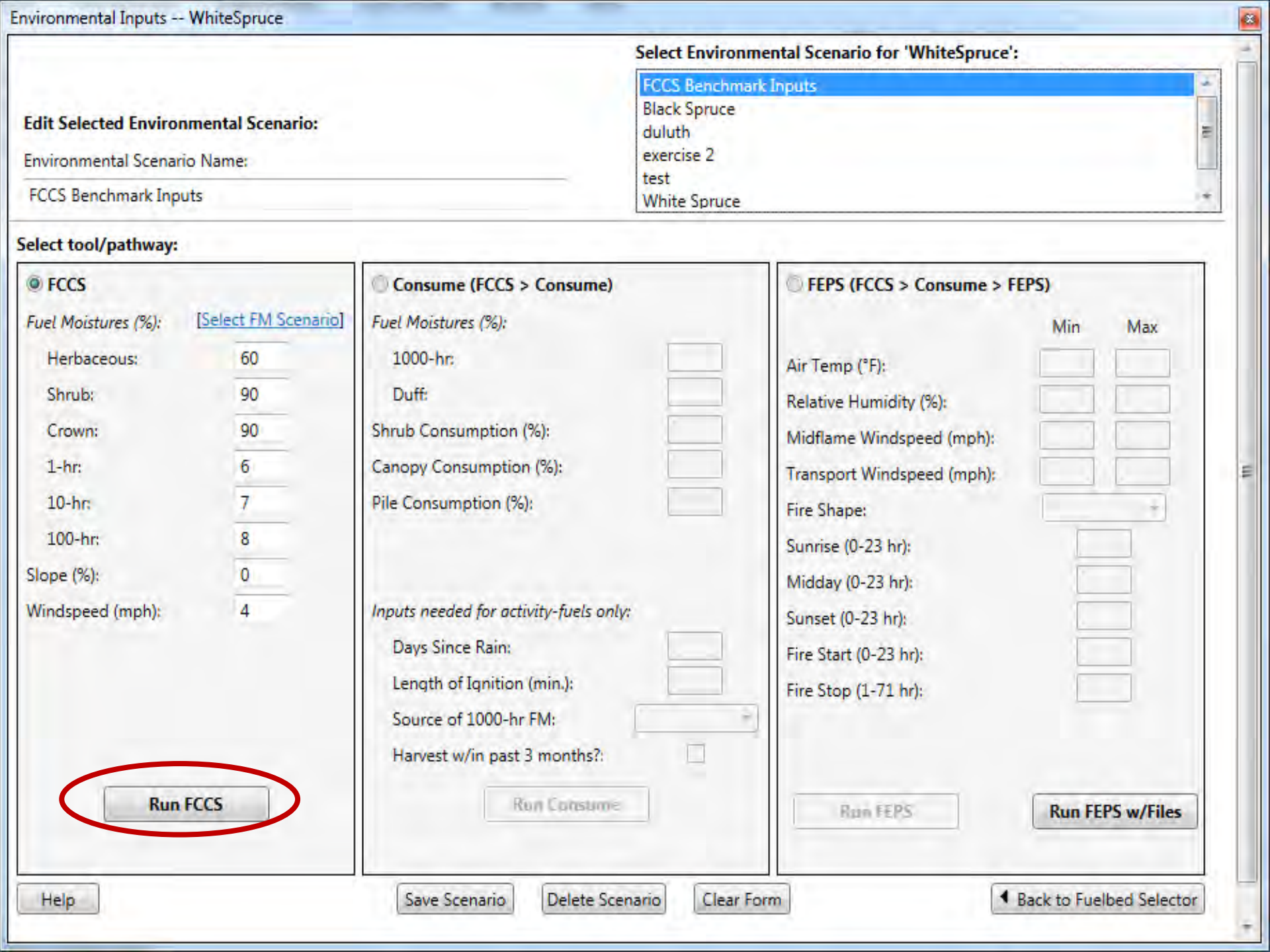
Edit fuelbeds

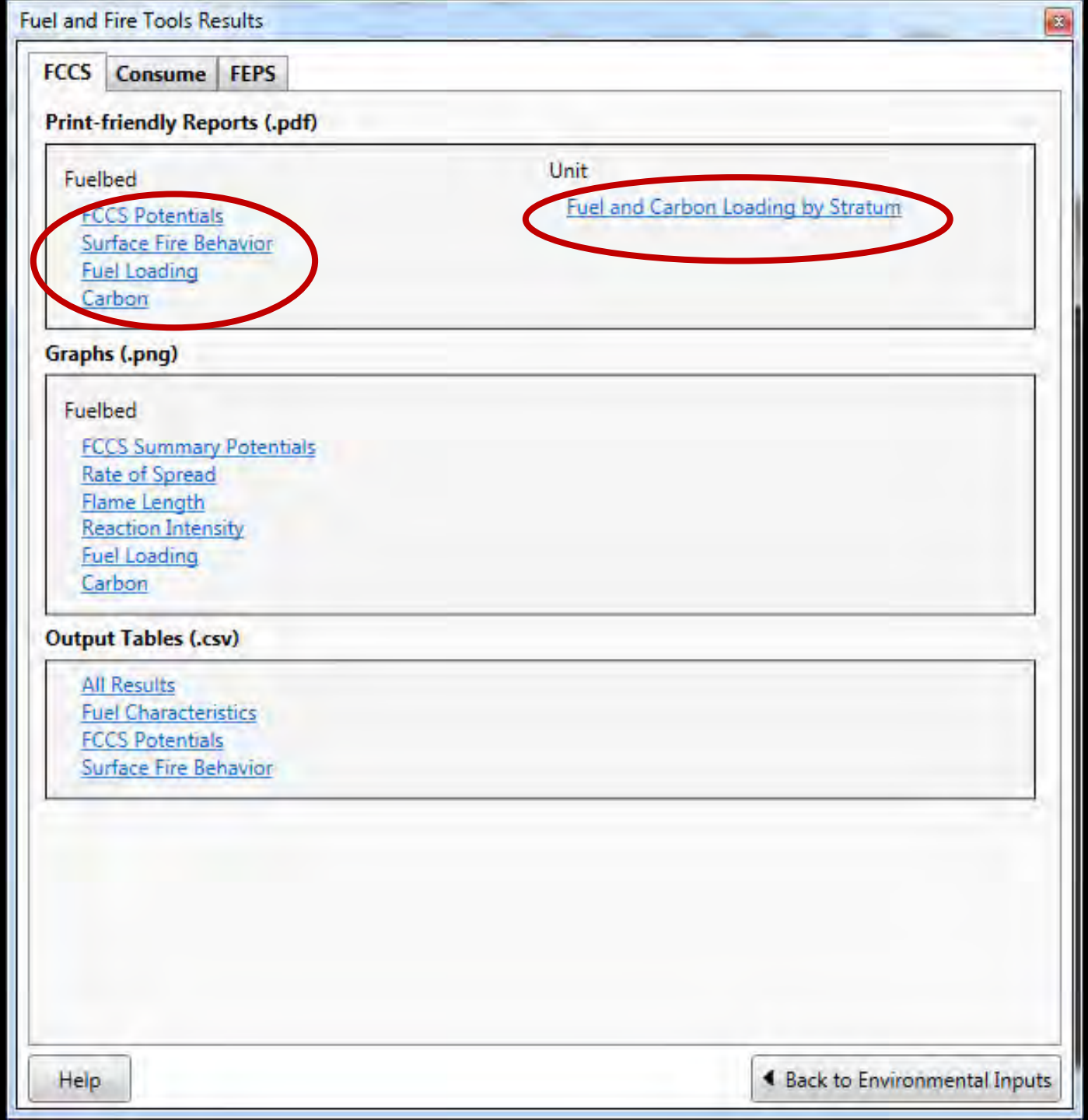
Next: Specify Environmental Inputs

For this exercise we will select white spruce with and without insect damage

FCCS Fuelbed 101 and 102: White spruce with and without insect damage


Fuelbed Selector -- WhiteSpruce
You can create your set of fuelbeds in three ways:
Version: 2.0.972
1. Select from the list below. Filter list of all fuelbeds by:
Clear all filters
Ecoregion:
Vegetation Form
Cover Type:
Structural Class:
Change Agent:
2. Browse your file system to select fuelbed (.xm
LANDFIRE fuelbed list (.lf) files:
Browse to file(s)...
3. Load a saved unit:
BlackSpruce2 | 1000 | 3 fuelbed(s)
Duluth | 1000 | 2 fuelbed(s)
WhiteSpruce | 1000 | 2 fuelbed(s)
List of all fuelbeds:361
Right-click on selected fuelbed to make copies
0: Bare Ground
1: Black cottonwood-Douglas-fir-quaking aspen forest
2: Western hemlock-western redcedar-Douglas-fir forest
3: Douglas-fir forest
4: Douglas-fir/ceanothus forest
5: Douglas-fir-white fir forest
6: Oregon white oak-Douglas-fir forest
7: Douglas-fir-sugar pine-tanoak forest
8: Western hemlock-Douglas-fir-western redcedar/vine maple forest
9: Douglas-fir-western hemlock-western redcedar/vine maple forest
10: Western hemlock-Douglas-fir-Sitka spruce forest
11: Douglas-fir/western hemlock-Sitka spruce forest
12: Red fir-mountain hemlock-lodgepole pine-western white pine fores
13: Mountain hemlock-Pacific silver fir forest
14: California black oak woodland
15: Jeffrey pine-red fir-white fir/greenleaf-snowbrush forest
16: Jeffrey pine-ponderosa pine-Douglas-fir-California black oak forest
17: Red fir forest
18: Douglas-fir/oceanspray forest
19: White fir-giant sequoia-sugar pine forest
WhiteSpruce's fuelbeds:
101: White spruce forest
102: White spruce forest with beetle damage
Save/edit this unit
Delete this unit
Start over/
Create new unit
Help
Use metric units
Edit fuelbeds
Next: Specify Environmental Inputs


Environmental Inputs -- WhiteSpruce
Select Environmental Scenario for 'WhiteSpruce':
FCCS Benchmark Inputs
Black Spruce
duluth
exercise 2
test
White Spruce
Edit Selected Environmental Scenario:
Environmental Scenario Name:
FCCS Benchmark Inputs
Select tool/pathway:
FCCS
Fuel Moistures (%):
[Select FM Scenario]
Herbaceous: 60
Shrub: 90
Crown: 90
1-hr: 6
10-hr: 7
100-hr: 8
Slope (%): 0
Windspeed (mph): 4
Run FCCS
Consume (FCCS > Consume)
Fuel Moistures (%):
1000-hr:
Duff:
Shrub Consumption (%):
Canopy Consumption (%):
Pile Consumption (%):
Inputs needed for activity-fuels only:
Days Since Rain:
Length of Ignition (min.):
Source of 1000-hr FM:
Harvest w/in past 3 months?:
Run Consume
FEPS (FCCS > Consume > FEPS)
Min
Max
Air Temp (°F):
Relative Humidity (%):
Midflame Windspeed (mph):
Transport Windspeed (mph):
Fire Shape:
Sunrise (0-23 hr):
Midday (0-23 hr):
Sunset (0-23 hr):
Fire Start (0-23 hr):
Fire Stop (1-71 hr):
Run FEPS
Run FEPS w/Files
Help
Save Scenario
Delete Scenario
Clear Form
Back to Fuelbed Selector


Fuel and Fire Tools Results
FCCS
Consume
FEPS
Print-friendly Reports (.pdf)
Fuelbed
FCCS Potentials
Surface Fire Behavior
Fuel Loading
Carbon
Unit
Fuel and Carbon Loading by Stratum
Graphs (.png)
Fuelbed
FCCS Summary Potentials
Rate of Spread
Flame Length
Reaction Intensity
Fuel Loading
Carbon
Output Tables (.csv)
All Results
Fuel Characteristics
FCCS Potentials
Surface Fire Behavior
Help
Back to Environmental Inputs

Fire Potentials

Variable	White Spruce 101	White Spruce 102 Insect Damage
	Potentials (0-9)	**Potentials (0-9)**
Surface Fire Behavior Potential	**6**	**9**
Reaction	3.5	6.4
Spread	5.6	9.0
Flame length	3.5	6.2
Crown Fire Potential	**7**	**7**
Crown fire initiation	7.2	9.0
Crown-to-crown transmissivity	8.9	5.8
Crown fire spread	5.7	5.9
Available Fuel Potential	**9**	**9**
Flame Available	2.7	3.4
Smolder Available	4.0	4.7
Residual Available	2.2	3.6
FCC Potential	**679**	**979**

Surface Fire Behavior Potential at Benchmark Conditions

Variable	White Spruce 101	White Spruce 102 Insect Damage
Rate of Spread (ft/min)	8.0	27.2
Flame Length (ft)	3.1	9.5
Reaction Intensity BTUs/ft^2-min	1967	6383
FBPS (original 13)	9 (Timber)	13 (Slash)
Standard 40	TU4 (Timber-Understory)	SB3 (Slash)

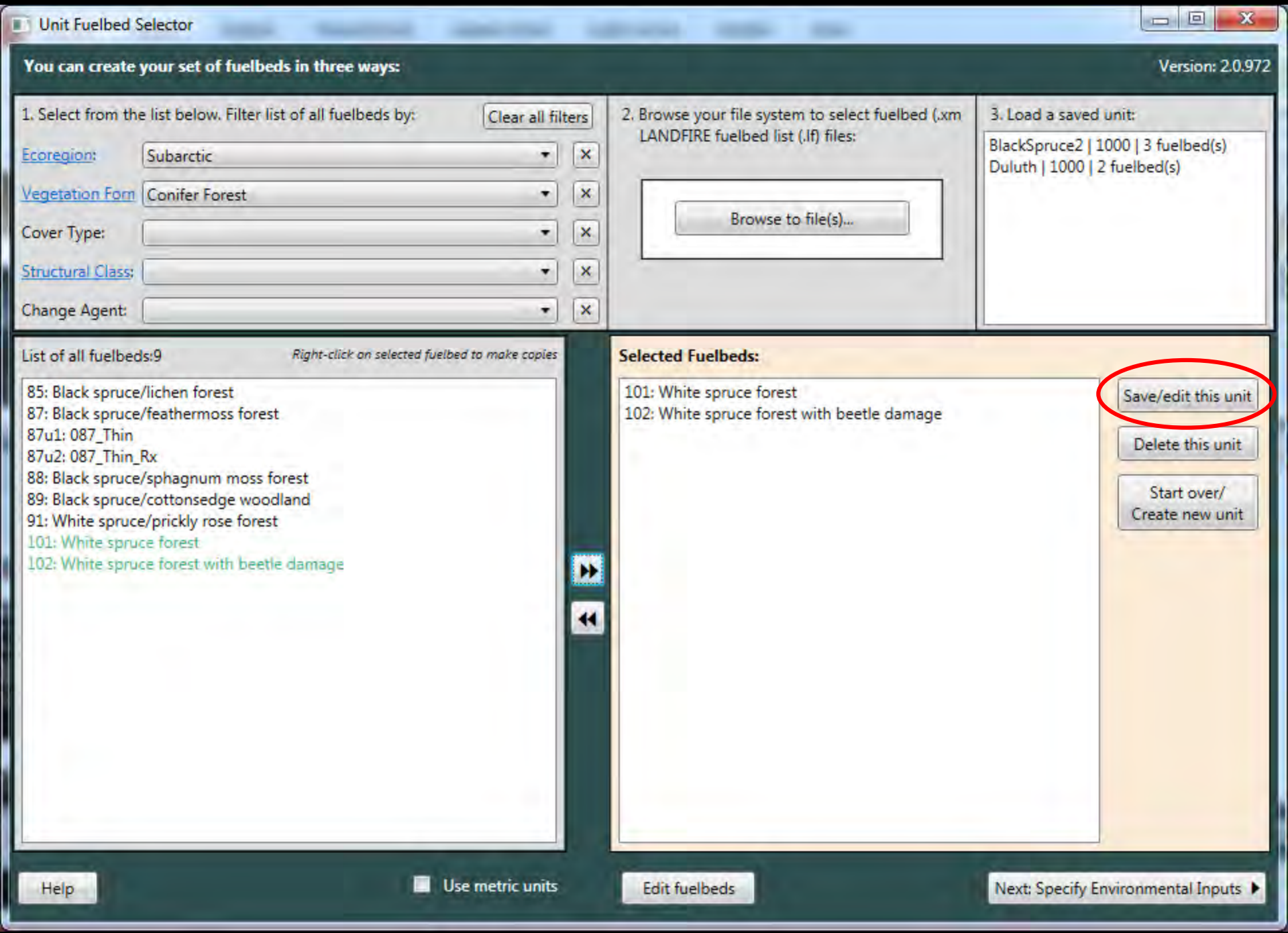
Fire Behavior Assessment

Fire behavior index: 679
ROS: 8.0
FL: 3.1
RI: 1967

Fire behavior index: 979
ROS: 27.2
FL: 9.5
RI: 6383

Consume 4.2:

Predicting consumption & emissions


Unit Fuelbed Selector
You can create your set of fuelbeds in three ways:
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Subarctic
Vegetation Form
Conifer Forest
Cover Type:
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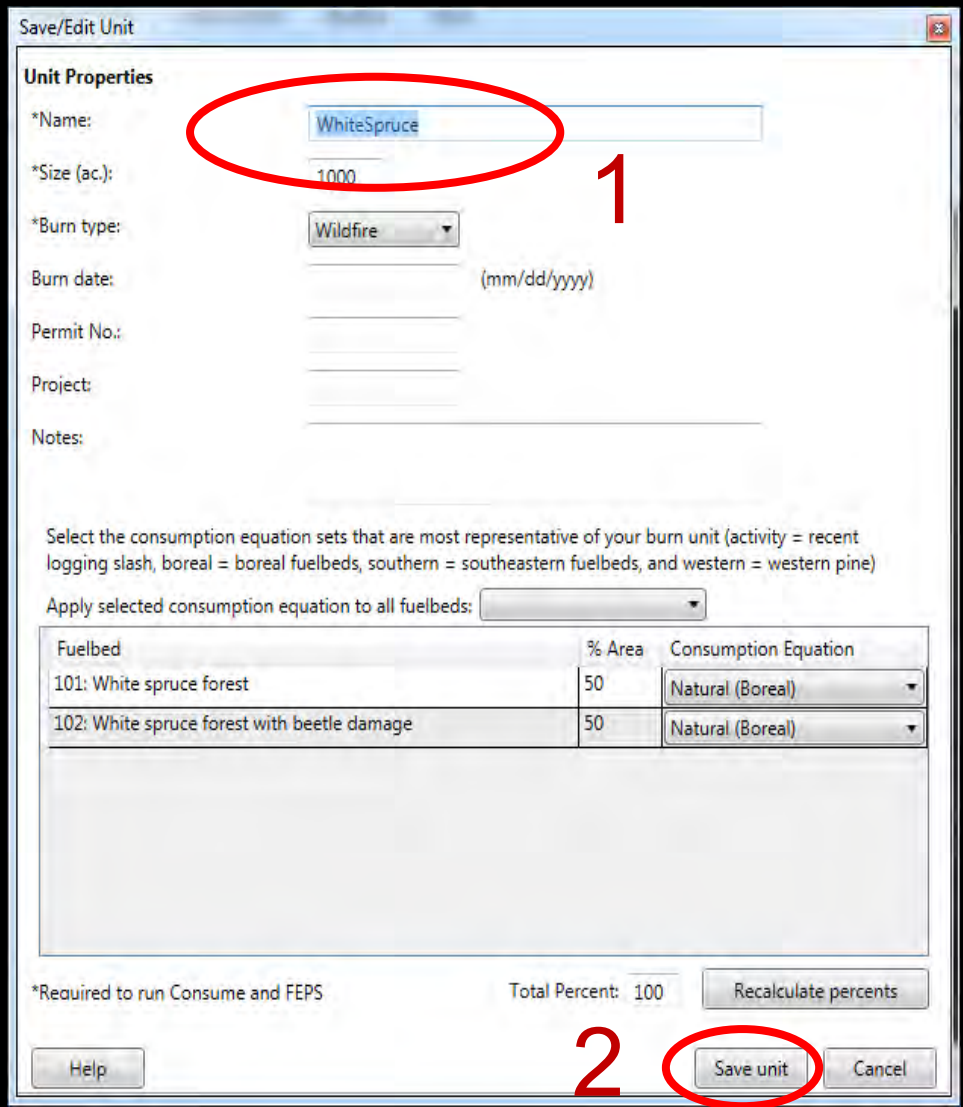
Change Agent:
2. Browse your file system to select fuelbed (.xm
LANDFIRE fuelbed list (.lf) files:
Browse to file(s)...
3. Load a saved unit:
BlackSpruce2 | 1000 | 3 fuelbed(s)
Duluth | 1000 | 2 fuelbed(s)
List of all fuelbeds:9
Right-click on selected fuelbed to make copies
85: Black spruce/lichen forest
87: Black spruce/feathermoss forest
87u1: 087_Thin
87u2: 087_Thin_Rx
88: Black spruce/sphagnum moss forest
89: Black spruce/cottonsedge woodland
91: White spruce/prickly rose forest
101: White spruce forest
102: White spruce forest with beetle damage
Selected Fuelbeds:
101: White spruce forest
102: White spruce forest with beetle damage
Save/edit this unit
Delete this unit
Start over/
Create new unit
Help
Use metric units
Edit fuelbeds
Next: Specify Environmental Inputs

Consume Instructions

Step 1: Create a burn unit (WhiteSpruce)

- Size = 1000 acres
- Click Save unit



Consume Instructions

Step 2: Specify environmental variables

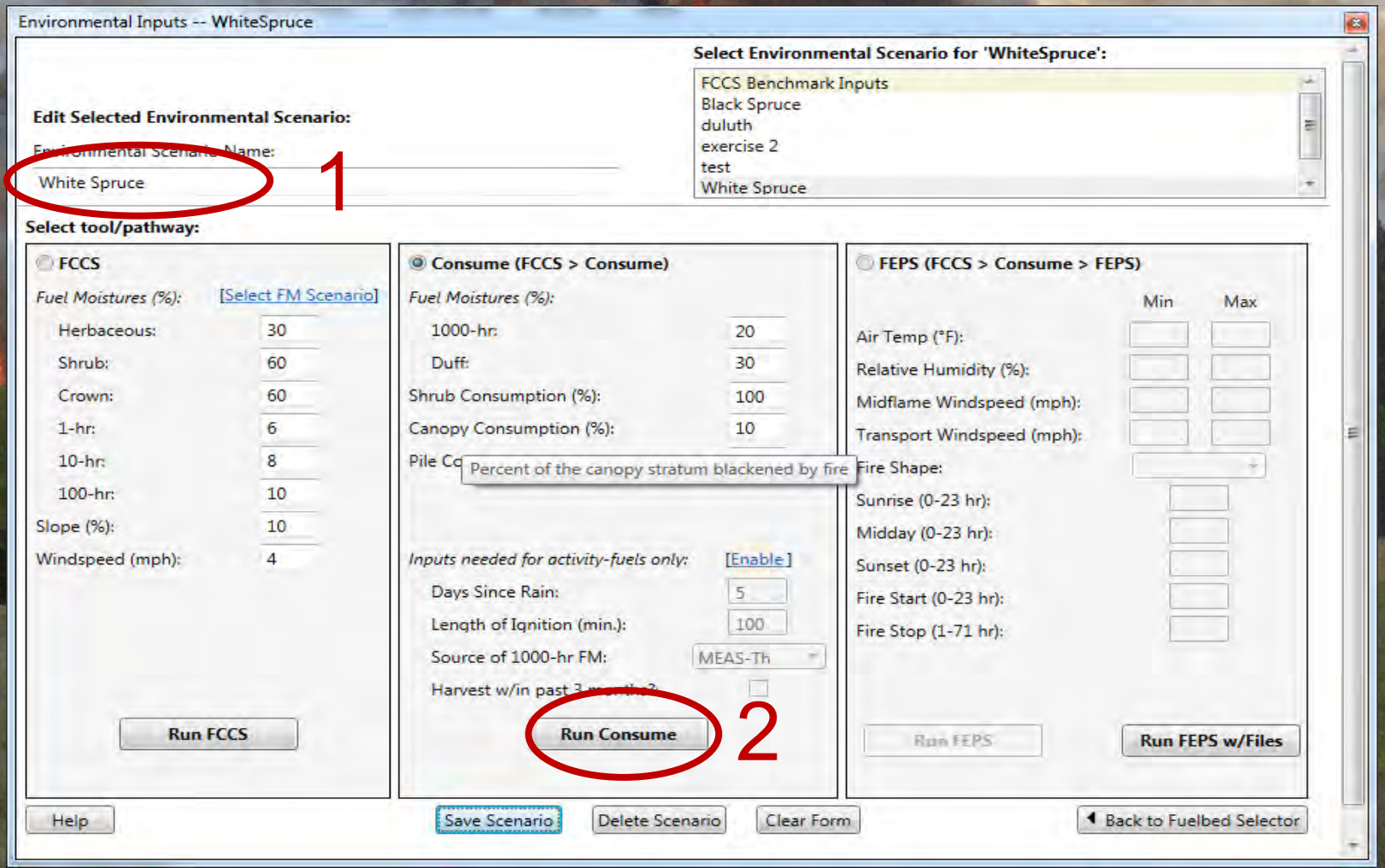
FCCS	INPUT
Herb FM (%)	30
Shrub FM (%)	60
Crown FM (%)	60
1-hr FM (%)	6
10-hr FM (%)	8
100-hr FM (%)	10
Slope (%)	10
Wind (mph)	4

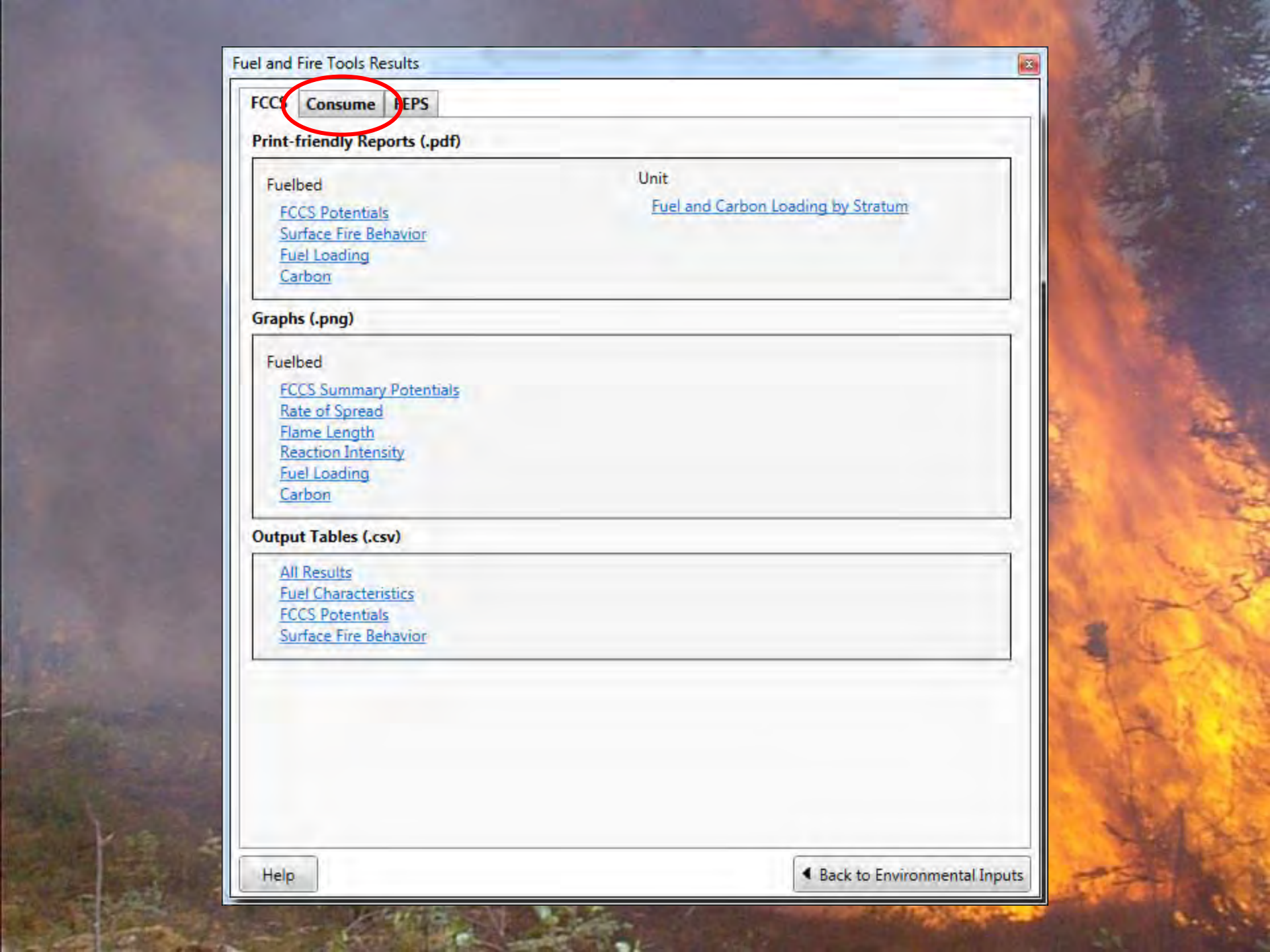
CONSUME	INPUT
1000-hr FM (%)	20
Duff FM (%)	30
Litter FM%	10
Shrub % cons	100
Canopy % cons	80
Pile cons (%)	90
Season	Spring
Days since rain	--
Length ignition (min)	--
Source 1000-hr FM	--
Harvest within 3 months?	--

Consume Instructions

Step 3:

- Save Scenario as White Spruce
- Run Consume

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Fuel Consumption

Variable	White Spruce 101	White Spruce 102 Insect Damage
Preburn loading (tons/acre)	83.5	118.2
Total Consumption (tons/acre)	47.9	62.61
Canopy (tons/acre)	10.25	11.48
Shrub (tons/acre)	1.76	2.57
Herb (tons/acre)	0.03	0.97
Wood (tons/acre)	3.95	15.55
LLM (tons/acre)	1.72	1.84
Ground fuels (tons/acre)	30.19	30.19

Pollutant Emissions

Variable	White Spruce 101	White Spruce 102 Insect Damage
CH4 (lbs/acre)	525	630
CO (lbs/acre)	10704	12957
CO2 (lbs/acre)	148768	196595
NMHC (lbs/acre)	370	454
PM total (lbs/acre)	1881	2308
PM 10 (lbs/acre)	1380	1678
PM 2.5 (lbs/acre)	1275	1546


Questions?
16 2:53 PM