Personal Computer Historic Analysis (PCHA)
Users' Guide

USDA Forest Service
USDI Bureau of Land Management
USDI Bureau of Indian Affairs
USDI Fish and Wildlife Service
USDI National Park Service

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Preface

This document describes the functions of the PC Historical Analysis module of the Fire Program Analysis (FPA) system. Individuals from the USDA Forest Service, USDI Bureau of Land Management, USDI Bureau of Indian Affairs, USDI Fish and Wildlife Service, and USDI National Park Service participated in the development of FPA. If you find errors, omissions, or items that need correction, please send your comments to the address below.

USDA Forest Service
National Systems Unit
3833 S. Development Ave
Boise, ID 83705
(800) 253-5559

To talk to someone at the Support desk with questions and/or comments regarding this site or any of the fire applications mentioned, call 800-253-5559 or email the Support desk at fire?/wo_nifc@fs.fed.us.

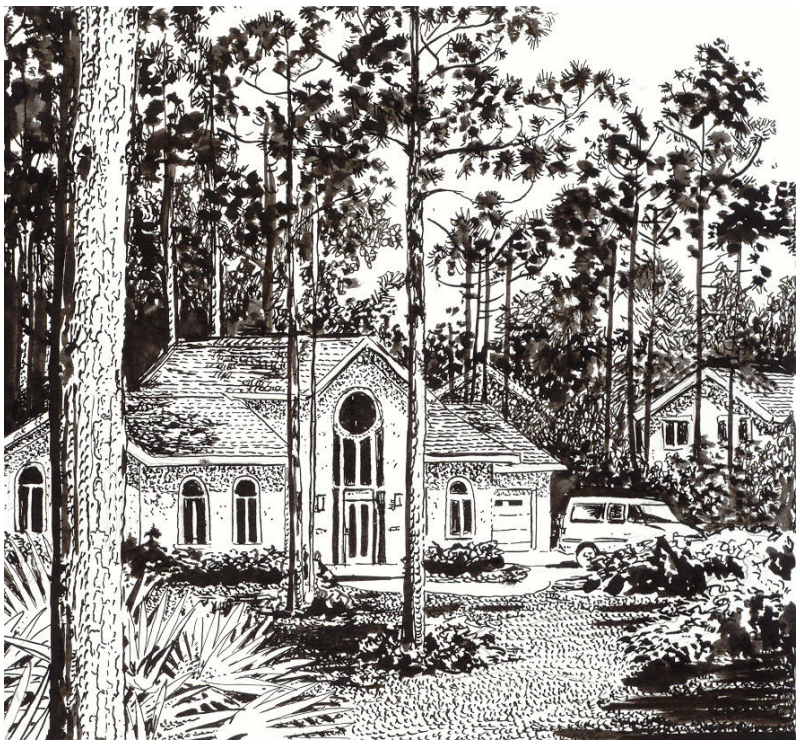


Table of Contents

Introduction

Welcome to the PCHA software program. The software has been developed to support the historical analysis process within the Fire Program Analysis system. PCHA allows for the import of fire occurrence and daily weather observation data for a Fire Planning Unit (FPU) to support the generation of fire event scenarios. Bighorn Information Systems developed PCHA under contract with the USDI Bureau of Land Management. PCHA can accept all legacy PCHA database files.

The fire occurrence and weather data records imported to PCHA reside in national corporate databases. Forest Service fire occurrence records are stored in the National Interagency Fire Management Integrated database (NIFMID). The U.S. Department of Interior agency fire occurrence records are stored in Boise, Idaho. Weather data records are also stored in the NIFMID database. Both data sets are available for downloading from the Internet.

How This Users' Guide Is Organized?

The General Processing Flow chart that follows describes the process steps and provides some background material on external tasks required before starting PCHA runs. The other chapters describe what to do on each of the screens. The sections, with a few exceptions, have the same name as the commands on the PCHA menus.

Conventions Used In This Users' Guide

Bold text and arrows will designate selection of menu items. An example is: **Fire => Edit Fires**. This notation directs the user to click on the Fire menu on the program taskbar and then to select the Edit Fires menu (Figure 1). In addition, bold underlined text will designate the clicking of buttons or tabs; i.e. **Browse**.

Figure 1

Program Availability

The PCHA software installation file, when finally released, can be downloaded from the Internet. The URL is as follows:

http://www.fs.fed.us/fire/planning/nist/distribu.htm

It will also be available on a CD ROM from the National Helpdesk, which can be reached by calling (800) 253-5559.

Until that time, the PCHA software installation file can be downloaded from:

http://www.fs.fed.us/fire/nfmas-beta/

Program Installation

The following text describes the tasks necessary to install PCHA on a personal computer.

Minimum System Requirements

Before program installation, verify that the computer meets the following minimum system requirements:

Table 1 – Minimum System Requirements

Item	Required	Recommended
Operating System	Windows 95 or higher	Same
CPU	80386	Pentium
Monitor Resolution	800 x 600	Same
RAM	4 MB	256 MB
Available Memory on the Hard Drive	5 Gigibits	Same
Mouse	Yes	Same
Printer	Any configured for use with the operating system	Color

Program Download Instructions from the NFMAS Beta Site

Step 1

Open Internet Explorer or any web browser.

Step 2

Navigate to the URL below:

http://www.fs.fed.us/fire/nfmas-beta/

Step 3

Click on the PCHA link. The screen in Figure 2 will be displayed.

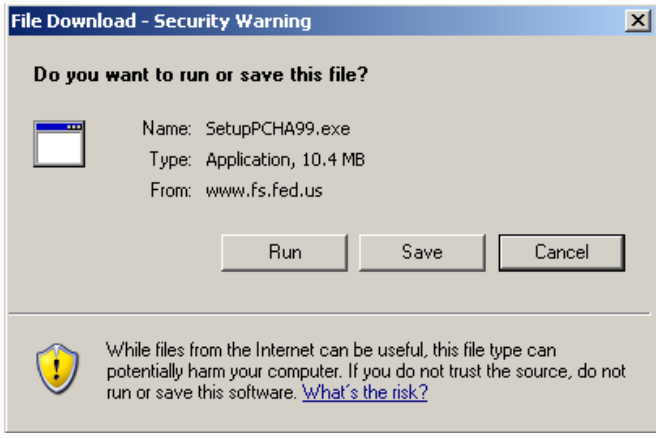
Step 4

Click **Save** on the screen shown in Figure 2.

Step 5

Navigate to the folder on the computer where the PCHA installation file titled SetupPCHA.exe is to be saved. Be sure to write down this file location. Click **Save**.

Figure 2



Program Download Instructions from the NFMAS Distribution Site

Step 1
Open Internet Explorer on any web browser.

Step 2
Navigate to the URL below:

http://www.fs.fed.us/fire/planning/nist/distribu.htm

Step 3
Scroll down the page to software, NFMAS modules. Double-click on PCHA_Version 1.2. link where X is the current version.

Step 4
On the next screen, double click on the PCHA_Version 1.2.X Download File link.

Step 5
Double-click on the PCHASetup.exe link. The screen in Figure 2 will be displayed.

Step 6
Click **Save** on the screen shown in Figure 2.

Step 7
Navigate to the folder on the computer where the PCHA installation file titled SetupPCHA.exe is to be saved. Be sure to write down this file location. Click **Save**.

Installation Instructions
The setup program installs the programs and support files required to run PCHA. The installation must be performed within the Windows environment.

Step 1
Program installation on most agency computers requires the user to have Administrator privileges. If necessary, have a user with Administrator privileges log onto the computer to perform the program installation. It is recommended the user have read and write permission for the folder into which PCHA is to be installed.

Step 2
Start Windows Explorer.

Step 3
If the SetupPCHA.exe file has been downloaded from the Internet, navigate to the folder where it was saved.

If the distribution CD ROM is being used, place the CD ROM in the CD ROM drive and navigate to the location of the SetupPCHA.exe file.

Step 4
Double-click on PCHA_install.exe. Install Shield will unpack PCHA. The user will be prompted throughout the following boxes:

The Welcome box will open. Click **Next** to continue setup.

The user will be prompted to accept the default location of:

c:\fsapps\fsprod\fam\nfmas\pcha

If desired, change this to another location by clicking on the Browse button. Click **Next** to accept the default or click **Browse** to change the location. Once this activity has been completed, click **Next** to continue.

The user will be prompted to select a program folder. The default is FPA. To accept click **Next**, to change scroll through the list of available choices or enter a new choice, then click **Next** to continue.

PCHA will install.

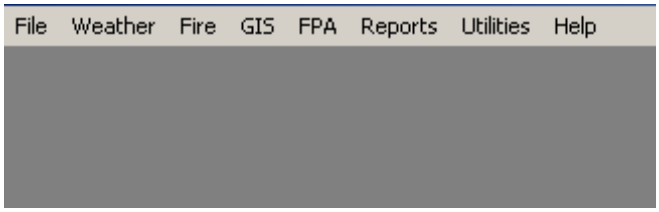
Getting Started
This documentation assumes the user knows how to use a mouse, open a menu, and choose a menu and dialog options. For those who need a refresher, the following brief review may help.

Navigating in PCHA

Using a Mouse
Using the mouse to run PCHA is much faster than keyboard control, and is much more efficient. The mouse moves the "cursor" (usually an arrow) around the monitor screen. To select an item on the screen, click on it by pressing the left mouse button. The left mouse button is used in the PCHA program. In some cases, it is necessary to click the mouse button twice in rapid succession. This action is called a double-click.

Menus

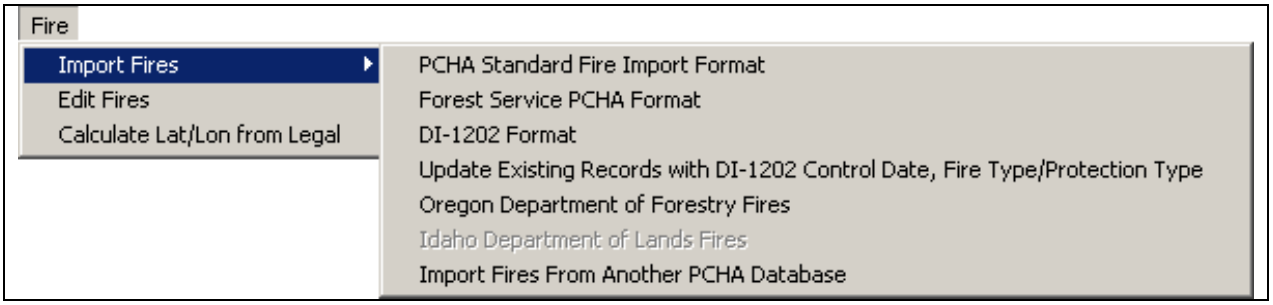
Figure 3 – Main Menu on Program Taskbar



The program taskbar across the top of PCHA screen contains menus (Figure 3). The planner can select a menu either by clicking on it with the mouse, or by using the keyboard. To use the keyboard, press and release the ALT key. The planner will see the File menu item highlighted. Select the menu desired by pressing the highlighted letter or by moving the cursor with the right, left, up and down arrow keys. Then press the ENTER key once the desired menu item is highlighted. If the ALT key is pressed by mistake, press the ESC key to exit from the menu.

Some menu items have a right facing arrow on the right side of the menu (Figure 4). This indicates that there is a sub-menu with more choices. Clicking on the small arrow will open the sub-menu and give more choices related to the menu item.

Figure 4 – Example of Sub-menus



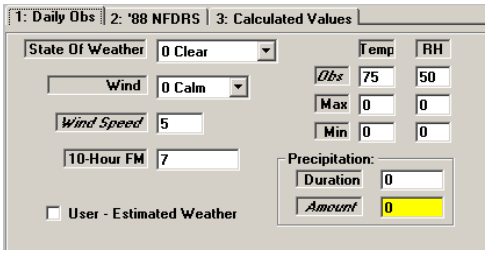
Screen Tabs

Figure 5

Both the Edit Weather and Edit Fire screens use folder tabs to display a portion of the information stored for those data groups (Figure 5). The command buttons and some information show all the time above or below the tabs. Click on the tab to display the information desired. For example, the Daily Obs. tab shows a daily weather observation.

The Tab Key

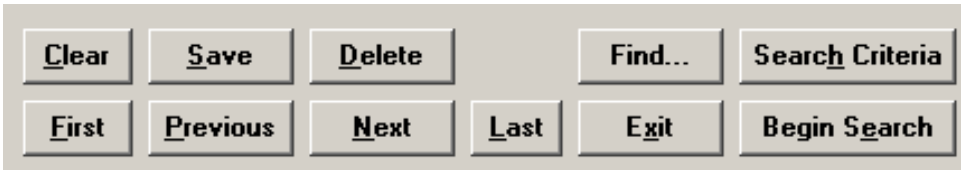
Figure 6



The TAB key moves the cursor from one field to another field on an Edit screen or a Dialog box. To move backwards, hold down the SHIFT key and press the TAB key. For example, refer to Figure 6. The cursor is moved from one cell to another in a specific order by pressing the TAB key.

Command Buttons
Many screens have Command Buttons such as **OK**, **Exit**, or **Save**. Clicking on the command button with the mouse will activate that command. If there is an underlined letter, the planner may also hold the ALT key down and press the underlined letter to activate the Command button.

Figure 7 – Command Buttons



Use of Command Buttons
All of these buttons are usable from any of the tabs to enter a new record or a search.

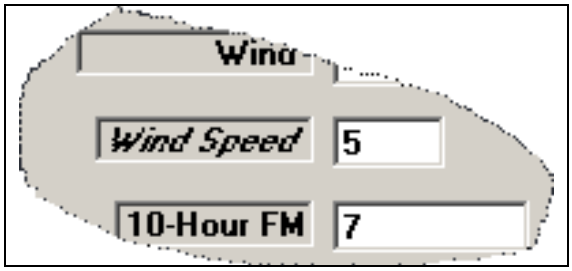
Save Button
The **Save** button saves the information for the active date to the PCHA database. Until this button is clicked, any changes made in fields are not permanently saved to the PCHA database.

Clear Button
The **Clear** button resets all data fields to blank.

Delete Button
This button deletes the current record from the database. If there are no records in the database or displayed on the screen, this button will be light gray and inoperative.

Labels in Italics
On some screens, some labels for fields are in italic (slanted) text (Figure 8). Fields designated this way are searchable fields. For example, the Wind Speed field allows the planner to search for a single wind speed value or wind speed values greater than or less than a specific value.

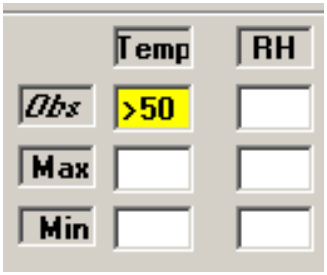
Figure 8



Begin Search Button
Click **Begin Search** to find the first record in the database or the first record that meets defined search criteria.

Search Criteria Button
Click **Search Criteria** to clear the screen and define the fields that will control, which records you want to find in the database. Fields with their names written in italic text are available for searches. After the criteria are entered, click **Begin Search**.

Figure 9



For example, the planner can search for all observations with temperatures greater than 50. Click Search **Criteria** , click in the Obs Temp field. Enter the following >50 and then click **Begin Search,** (Figure 9).

Searching can be done based on a range of values. For example, to find precipitation events between 2 inches and 10 inches, click **Search Criteria** . Click in the Precipitation Amount field and enter >=2.0 and <=10.0. Click **Begin Search.** This search will find all weather observations that have between 2 inches and 10 inches of precipitation for the day.

First, Previous, Next, and Last Buttons

The **First** button displays the first record in the database or the search list. The **Previous** and **Next** buttons display the record before or after the current record. The **Last** button displays the last record in the database or search list. These buttons show light gray if there are no records in the database or displayed on the screen.

Find Button

Unlike the **Search Criteria** and **Begin Search** buttons, which retrieve a set of records to view, the **Find** button is used to jump to desired records within those already retrieved with **Begin Search**. Click **Find** and then select Clear for Find from the pop-up menu. This will clear all fields. Enter the value(s) to determine which record is wanted, and then click **Find** and select Find from the pop-up menu. To move from record to another similar record after a **Find** command, click **Find** and then select Find Next or Find Previous from the pop-up menu.

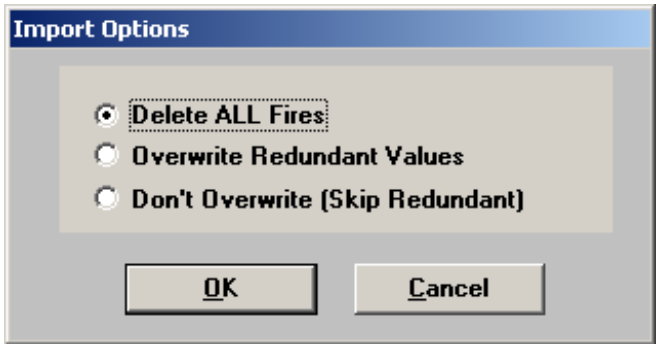
Exit Button

The **Exit** button closes the screen and returns the user to the main PCHA screen.

Option Buttons

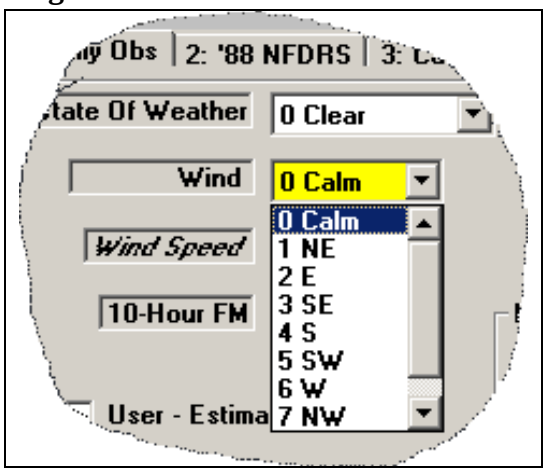
Some screens have Radio Buttons (small circles) where the planner can select one item from the group. When the planner chooses one, a small black dot notes the selected option. In the example in Figure 10, the Delete ALL Fires option has been selected. The planner can select an option by clicking on wording with the mouse. The planner can also select an option by using the up and down arrows to highlight the desired Option. Select that option by pressing the ENTER key.

Figure 10 - Option Box with Radio Buttons



List Boxes
Some screens have List Boxes with a pulldown list. The planner can choose one item by clicking on it with the mouse (Figure 11).

Figure 11 – List Box



Shortcut
When the planner highlights a list box, the planner can press a valid letter or number in the list box. In the example in Figure 11, pressing a number from 0 to 7 will cause the item to be highlighted. Pressing the ENTER key will select the highlighted item.

Using Online Documentation and Help

The PCHA release includes this documentation in electronic form to help guide the planner in its use. In addition, there is extensive online help for nearly every field and command. Details on how to use the online help capabilities are provided. Many parts of PCHA include context-sensitive help. Full online help may not be available for work needed to support Fire Program Assessment, FPA.

Product Support

Several groups and individuals support the PCHA software. Federal users should first contact their agency support personnel for assistance. Forest Service and other users should contact local and regional support personnel before contacting the National F&AM Application Helpdesk at: fire?/wo_nifc@fs.fed.us.

General Process Flow

The process used to complete an analysis in Fire Program Assessment (FPA) starts with the establishment of the FPU in FPA-PM. Refer to the Users' Guide for FPA-PM and the FPA-PM Reference Guide for instructions on this process.

The purpose of Historical Analysis is the review and validation of fire occurrence and weather data for use in the creation of a fire event scenario. A fire event is a single wildland fire measured in time from its estimated ignition time through its life until out. A fire event is the collective sum of attributes that describe the statistical and physical characteristics of the fire. Grouping of fire events yields a fire event scenario.

The creation of a fire event scenario is also done using PCHA. Figure 12 shows the link between the FPA-PM program and the PCHA program. The FPU is created in PCHA via the import of GIS shape files exported to the local computer by FPA-PM. After a fire event scenario is created by PCHA, the fire planner imports the resulting file to FPA-PM.

The process flow for tasks to be performed in PCHA is described via a stepwise process in Table 2. Provided in the table is the page number in this Users' Guide where implementation details are provided for a step. Also provided in the table is the page number in the FPA-PM Reference Guide where technical documentation and guidance is provided.

Figure 12 – Process Flow Between FPA-PM and PCHA

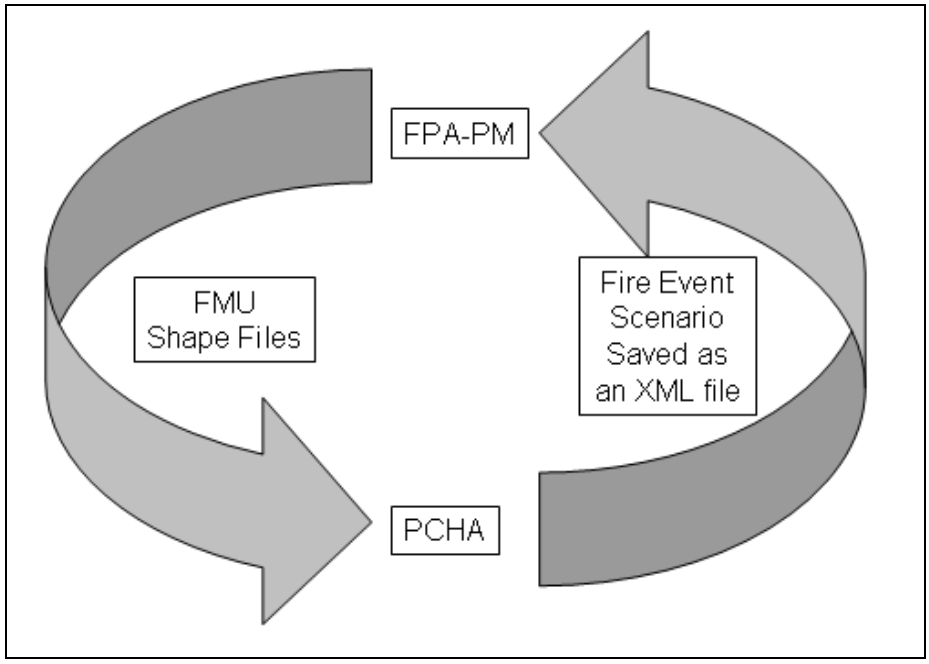
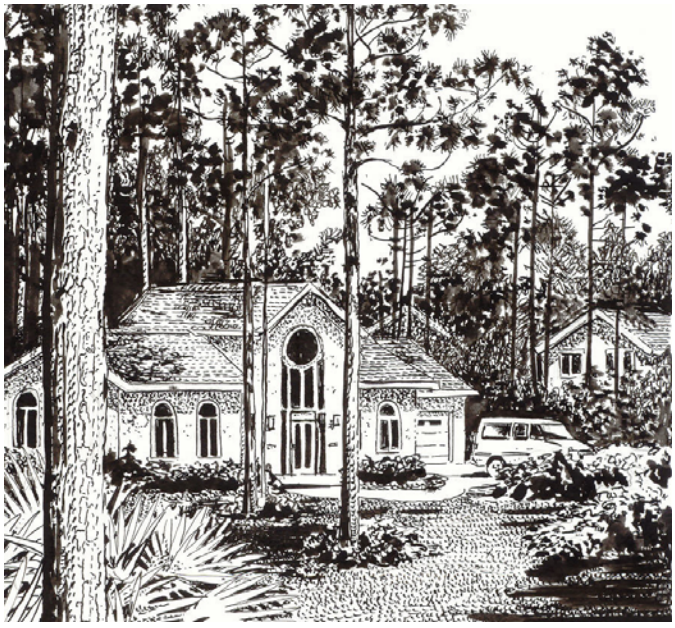


Table 2 - Process Steps to Completion of Historic Analysis Using PCHA				
Step	Description	PCHA Menu	Users' Guide Page	Reference Guide Page
1	Install PCHA on the computer.			
1a	Setting up PCHA start icon.			
2	In PCHA, Define the Planning Unit.			
2a	Input data.	File => Planning Unit Setup		
2b	Import FMUs from FPA-PM.	FPA => Import FPA-PM Layer to Start New Analysis		
2c	Edit FMU slope class.	FPA => Edit FMU Slope Class		
3	Define weather stations, weather data sets and retrieve these records.			
3a	For each FMU, determine if weather stations will be used to develop the weather data set for the FMU or if the GRID weather process will be used.			
3b	For each FMU where weather stations will be used, determine the weather stations to use.			
3c	For FMUs where GRID weather will be used, estimate the latitude and longitude for a point that will represent the FMU.			
3d	Define the weather stations and GRID weather datasets in PCHA.	File => Weather Stations		
3e	For weather stations being used, retrieve from the corporate database all available weather records.			
3f	For FMUs where GRID weather data sets will be used, retrieve the data set via the Internet.			
3g	Import all weather records and weather datasets into PCHA.	Weather => Import (Applicable Format)		
4	Retrieve Fire Report Records.			
4a	Retrieve from the corporate database all available fire occurrence records.			
4b	If necessary, transform an agency's fire occurrence records into a format that can be used to import these fire occurrence records into PCHA.			

Table 2 - Process Steps to Completion of Historic Analysis Using PCHA				
Step	Description	PCHA Menu	Users' Guide Page	Reference Guide Page
4c	Import all fire records into PCHA.	Fires => Import Fires => (Applicable Sub-menu)		
4d	Implement Substitute Measures if Fire Records Are Not Available.			
5	Verify completeness and accuracy of weather records.			
5a	Repair invalid observations.	Weather => Repair Invalid Weather Observations		
5b	Do queries to find obvious invalid.	Weather => Edit Weather Observations		
6	Use weather records.			
6a	Assign weather stations to FMUs.	FPA => Assign Wx Stations to FMUs		
6b	Create the weather data set for each FMU.	FPA => Create FMU Weather Data Set		
6c	Check for missing weather.	FPA => View Missing Weather Report		
6d	Implement additional weather data gathering processes if necessary. If necessary, go to Step 3.			
6e	If wildland fire use will be used in any FMU in the FPU, develop the waiting time distribution for the fire-ending event for each applicable FMU.	FPA => Determine Waiting Time Distribution		
7	Verify completeness and accuracy of fire records.			
7a	Check for possible duplicate fires.	FPA => Report Possible Duplicate Fires		
7b	Assign latitude and longitude to fires where necessary.			
7b1	Determine the appropriate latitude and longitude for the fire's ignition location. Enter it manually into the fire's record in PCHA.	Use Fires => Edit Fires => Location Tab.		
Or				

Table 2 - Process Steps to Completion of Historic Analysis Using PCHA				
Step	Description	PCHA Menu	Users' Guide Page	Reference Guide Page
7b2	Automatically, assign latitude and longitude from Township, Section, Range and Meridian.	Fire => Calculate Lat/Lon from Legal		
7c	Check for accuracy and completeness of required or recommended data fields.	FPA => Fires Missing Data Required for FPA		
7d	Edit fire records.	Fire => Edit Fire Records		
8	Use fire occurrence records.			
8a	Assign each historic fire that occurred during the analysis period to an FMU.	FPA => Assign FMUs to Fires Using GIS		
8b	Review FMU assignment results.	FPA => View FMU Assignment Results		
8c	For fires without an assigned FMU, make changes to the fire record.			
8c1	If the latitude and longitude are incorrect, determine and enter the correct latitude and longitude. Then repeat Step 6a.	Fire => Edit Fires => Location Tab.		
Or				
8c2	Manually assign fires to an FMU.	Fire => Edit Fires => FPA Tab		
8d	Calculate and make edits if necessary to the each FMUs fire workload point.	FPA => Calculate/Edit FMU Workload Point		
9	Locate and gather topographic grid files.	FPA => Identify FMU ASCII Grid Files		
10	(Optional – Complete this step or step 12) use spatial fuel types for some or all FMUs by locating or generating fuel type grid files.			
10a	Locate and make available fuel type grid files.			
Or				
10b	Generate and make available fuel type grid files			
10c	Identify to PCHA the directory and folder location for the fuel type grid files.	FPA => Identify FMU ASCII Grid Files		
11	Collect FMU ASCII grid files into PCHA.	FPA => Collect FMU ASCII Grid Information		

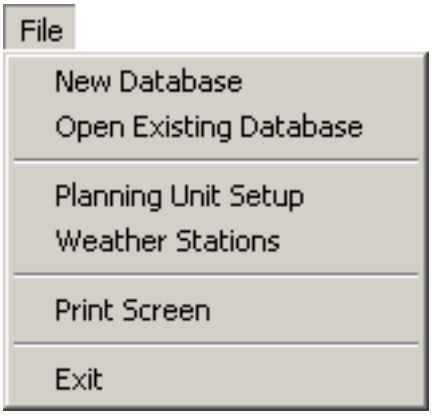
Table 2 - Process Steps to Completion of Historic Analysis Using PCHA				
Step	Description	PCHA Menu	Users' Guide Page	Reference Guide Page
12	(Optional – Complete this step or step 10) use non-spatial fuel types for some or all FMUs by developing fuel types for the FPU and assigning these the occurrence proportion for each fuel type to the applicable FMUs.			
12a	Define all of the fuel types in the FPU.	FPA => FPU Fuel Types		
12b	For each FMU where non-spatial fuel types will be used, assign the percent of the FMU that exists in each fuel types.	FPA => FMU Fuel Type Percents		
13	Calculate fire behavior, bins and fire probabilities.	FPA => Calculate ERCg and Wind Speed Bins, Fire Probabilities		
14	Determine preparedness season.	FPA => Determine Preparedness Season		
15	Prepare the fire event scenario.			
15a	Prepare probability-based fire event scenario.	FPA => Prepare Probability-based Fire Event Scenario and XML File for FPA		
Or				
15b	Prepare historic-based fire event scenario.	FPA => Prepare Historic-based Fire Event Scenario and XML File for FPA		
16	View FPA scenario details.	FPA => View FPA Scenario Details		
17	Transfer XML file to FMA-PM. Use FPA-PM to do this.			



The File Menu

The file menu allows the planner to create or open an existing PCHA database, to create and edit attributes of the FPU and to define and edit attributes for weather stations that will be used. The planner can print a screen using the Print Screen menu items. The Exit menu item allows the planner to quit the program (Figure 13).

Figure 13 – The File Menu

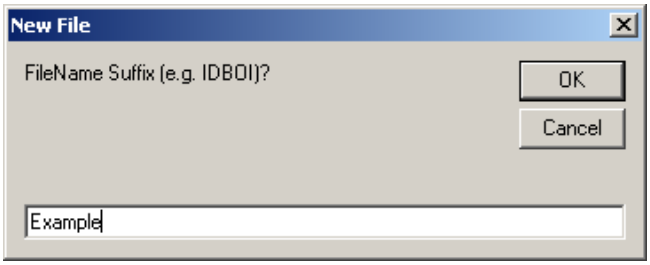


The PCHA Database

All data entered or imported via the PCHA program is stored in a Microsoft Access© database. The file extension for this database is mdb.

New Database

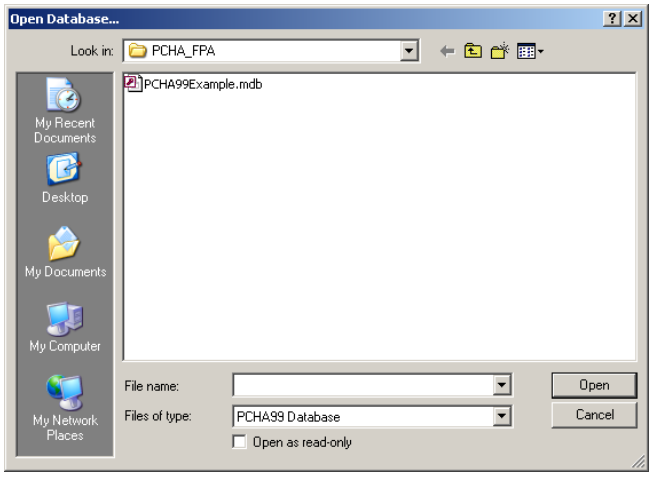
Figure 14



This menu item allows the planner to create a new PCHA database. This activity would be preformed when a new FPU is created. When this menu is selected, the dialog screen shown in Figure 14 appears. As with all files, a name needs to be designated for this new database. Enter that name in the box provided using only characters that are allowed in the Windows file naming convention. The name Example is entered, the new database will have a file name of PCHA99Example.mdb. Notice the program adds the PCHA letters in front of the name specified.

Open Existing Database

Figure 15

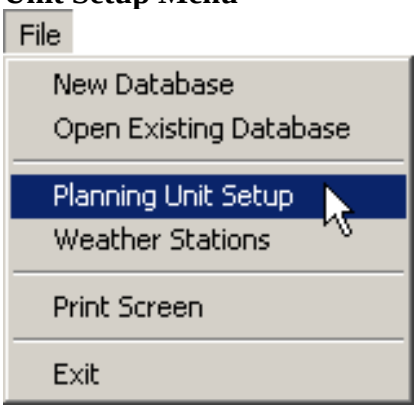


This menu item allows the planner to open a currently defined PCHA database. When this menu item is selected, the standard file open dialog as shown in Figure 15 is displayed. The default location where PCHA looks for existing databases is in the folder where the PCHA software is installed. If the desired PCHA database is not located there, navigate to the folder where the database is located. Click on the file so that it appears in the File name box at the bottom of the dialog screen and click **Open**. When PCHA is started, the last active database is opened automatically.

Planning Unit Setup

Before the planner can import weather and fire records, the planner must enter the Planning Unit Setup values, particularly the unit identification. Once these values are defined, the planner will not usually need to return to the Planning Unit Setup menu.

Figure 16 – The Planning Unit Setup Menu



Selecting the Planning Unit Setup screen will result in the display of a screen similar to the one shown in Figure 17. The last part of the screen in Figure 17 is used to select the fire planning process being used. This controls the menu options made available. Select **FPA**.

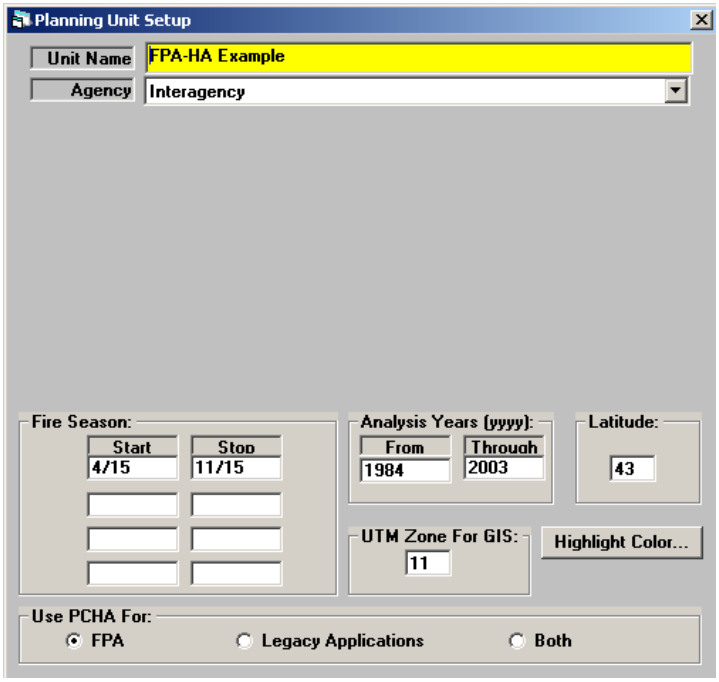
Unit Name

Enter the FPU name. This is an optional but highly recommended entry.

Agency

Click anywhere in the highlighted box and select the agency group that best describes the agencies participating in the FPU. If more than one agency is participating, select Interagency.

Figure 17 – The Planning Unit Setup Screen



Preparedness Staffing Season
Enter the beginning date (e.g. 4/15) and ending date (e.g. 11/15) for the analysis.

Analysis Years
Enter the beginning and ending years for the analysis. Data can be imported beyond the analysis years, but most reports only show fires within the analysis period. Fire occurrence records may contain fires from 1970 to 1995, but if the analysis period is from 1986 to 1993 then only fires from 1986 through 1993 will be used.

Enter the beginning year (e.g. 1984) and the ending year (e.g. 2003) to define the analysis period.

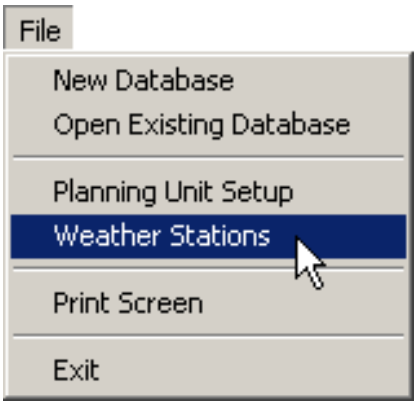
Latitude
Enter the average latitude for the FPU as an integer.

UTM Zone for GIS
Enter the UTM Zone for the FPU.

The Highlight Color Button
The default light color (the color shown in the box where entries are made) is yellow. To change this color from the default, click on **Highlight Color**. Select the color desired from the 48 basic colors or create a custom color.

Weather Stations

Figure 18 – The Weather Stations Menu

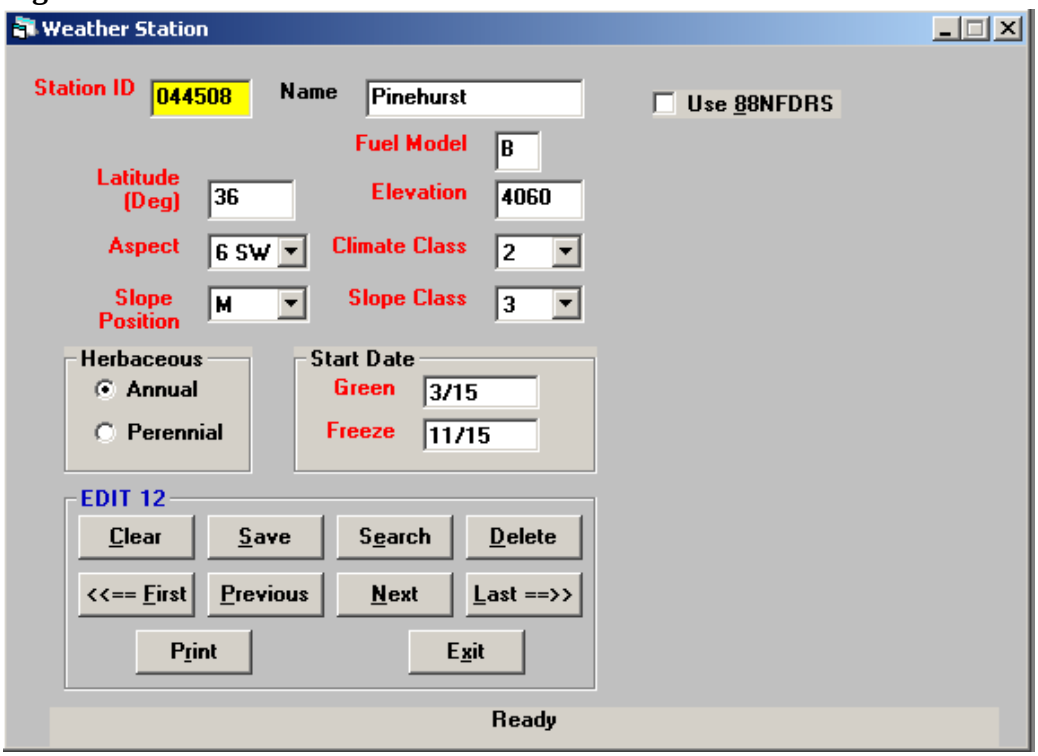


Selecting File => Weather Stations the screen shown in Figure 19. Figure 19 shown an example of data to be entered for each weather station identified for use in the analysis. PCHA requires all data fields be completed. Each weather station must be defined before weather observations for a weather data set can be imported. One source for most of the information is the WIMS station catalog available at http://famweb.nwcg.gov/weatherfirecd/.

Search Button
Click **Search** to find the first weather station record in the database. Once weather station is displayed, the planner can use **First**, **Previous**, **Next**, and **Last** to move through the stations. The planner can also search for a particular weather station.

Station ID
Enter the six-digit weather station identifier. The station identifier can contain both numbers and letters.

Figure 19 – Screen to Define Weather Stations Attributes



Station Name
Enter the station name (up to 12 characters). This entry is optional but strongly recommended. Many people know the station name but not the station number.

Fuel Model
Enter the NFDRS fuel model to use for this station. Valid entries are letters A-L and N-U. Table 3 contains a listing of the NFDRS fuel models.

Table 3 – NFDRS Fuel Models

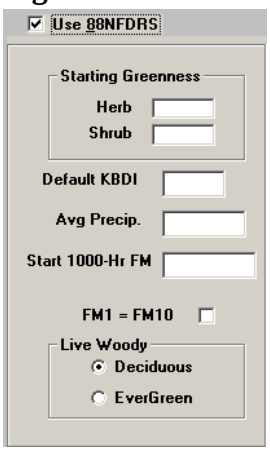
Fuel Model	Description	Fuel Model	Description
A	Western annual grass	K	Light logging slash
B	California mixed chaparral	L	Western perennial grass
C	Pine grass savannah	N	Sawgrass
D	Southern rough	O	High pocosin
E	Hardwoods (winter)	P	Southern pine plantation
F	Intermediate brush	Q	Alaska black spruce
G	Closed short needle conifer (heavy)	R	Hardwoods (summer)
H	Closed short needle conifer (light)	S	Alaska tundra
I	Heavy logging slash	T	Sagebrush grass
J	Medium logging slash	U	Western long needle conifer

Latitude (Degrees)
Enter the latitude in degrees for the station. This value affects fire danger calculations. Daylight length changes with latitude and season, which affects solar radiation on the fuels.

Elevation
Enter the elevation in feet above mean sea level of the station. This value affects the calculation of the fire behavior indices when PCHA adjusts the fire behavior indices from the weather station to the fire location.

Use 88 NFDRS
Check the box if the 1988 version of NFDRS is to be used. Required additional inputs include the starting greenness factor for both herbaceous and woody vegetation, the default Keetch-Byram Drought Index (KBDI), the average annual precipitation, the starting 1000-h timelag fuel moisture and designation of the live woody vegetation as deciduous or evergreen (Figure 20). Checking this option will enable the use of 1988 NFDRS models in calculations. Some calculated values will show for each day in the '88 NFDRS tab. This box should remain unchecked unless all the required data is available.

Figure 20



Aspect
Select the aspect the weather station is on.

Climate Class
Select the climate class that best describes the rainfall regime in the FMU represented by the weather station (Table 4). Climate class defines variable drying rates for annual, perennial, and woody plants within the live fuel moisture model. Plants have adapted to various moisture regimes and respond differently to rainfall. Those adapted to moist environments lose moisture faster than those from dry environments. Plants growing in drier climates typically respond more quickly to rainfall events. Choose the appropriate climate class that represents how local plants respond to rainfall events.

Table 4 – Climate Class Definitions

Code	Definition
1	Arid, semiarid.
2	Subhumid (rainfall deficient in summer)
3	Subhumid (rainfall adequate in all seasons)
4	Wet

Slope Position
Choose the slope position that best describes the location of the weather station (Table 5).

Table 5 – Slope Position Definitions

Alpha Code	Numeric Code	Description
L	1	Flat to Lower 1/3rd of slope
M	2	Middle 1/3rd of slope
U	3	Upper 1/3rd of slope

Slope Class
Enter the slope class that best describes the slope class where this weather station is located (Table 6). Percent slope is the rate of elevation gain or loss in feet per 100 feet horizontal distance. Slope classes include a range of slopes as defined below.

Table 6 – Slope Class Definitions

Code	Definition	Slope Used
1	0 – 25%	22.5%
2	26 – 40%	31.8%
3	41 – 55%	44.5%
4	56 – 75%	66.3%
5	75%+	90.0%

Herbaceous
Select the option for either annual or perennial that best represents the herbaceous vegetation in the FMU represented by this weather station.

Start Date
Enter the date herbaceous vegetation typically greens-up, and the date herbaceous vegetation freezes in a typical year for the FMU represented by this weather station. Entries must be month and date numbers separated by a slash or period.

Print Button
Print tells the computer to generate a page that looks like the weather station screen. This is a nice way to document entries and allows someone else to check the data.

Exit Button
Exit closes the Weather Station entry screen and returns to the main PCHA screen.

Print Screen
This command allows the printing of any screen for documentation purposes (Figure 21).

Exit
The Exit menu closes all PCHA files and screens and returns control to the Windows program manager (Figure 22).

Figure 21 – The Print Screen Menu

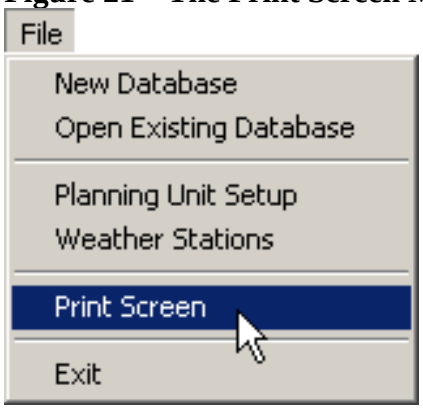
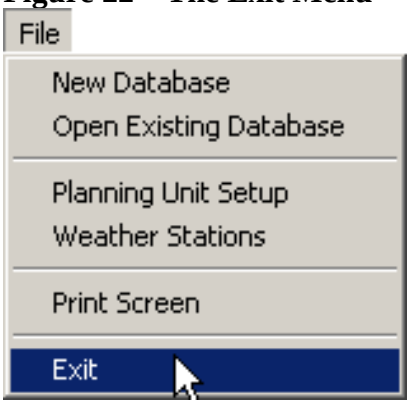


Figure 22 – The Exit Menu



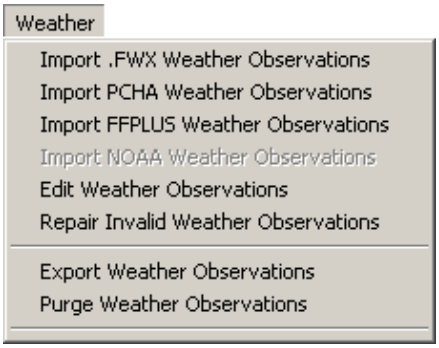
The Weather Menu

The functions on this menu are available when selecting Weather from the main menu. The planner can import, edit, and export weather observation records and GRID weather data sets. The planner can also edit weather observation fields, enter Keetch-Byram Drought Index (KBDI) starting values, repair certain problems on observations and calculate National Fire Danger Rating System values.

Import Weather

Importing weather data into PCHA for review, editing, and use as part of the fire planning effort is a powerful tool. This release allows the importing of ASCII weather observation or data set files in fwx or fw9 format. Options also exist for importing the weather station attributes and weather observation records from another PCHA database or a FireFamily Plus database. In addition, weather observations taken at a National Oceanographic and Atmospheric Administration (NOAA) can be imported (Figure 23).

Figure 23 – The Weather Menu



Obtaining .FWX Weather Observation Records

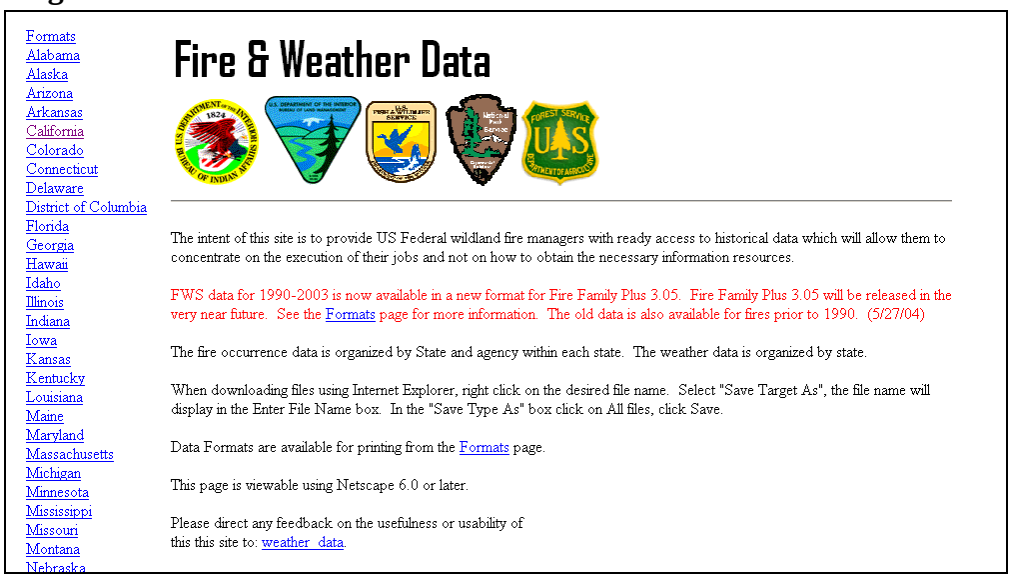
The fire planner must obtain weather observation records. Several sources are available.

Obtaining NFDRS Weather Station Observation Records

Weather records from a NFDRS weather station are available from the FAMWEB Internet site at the URL:

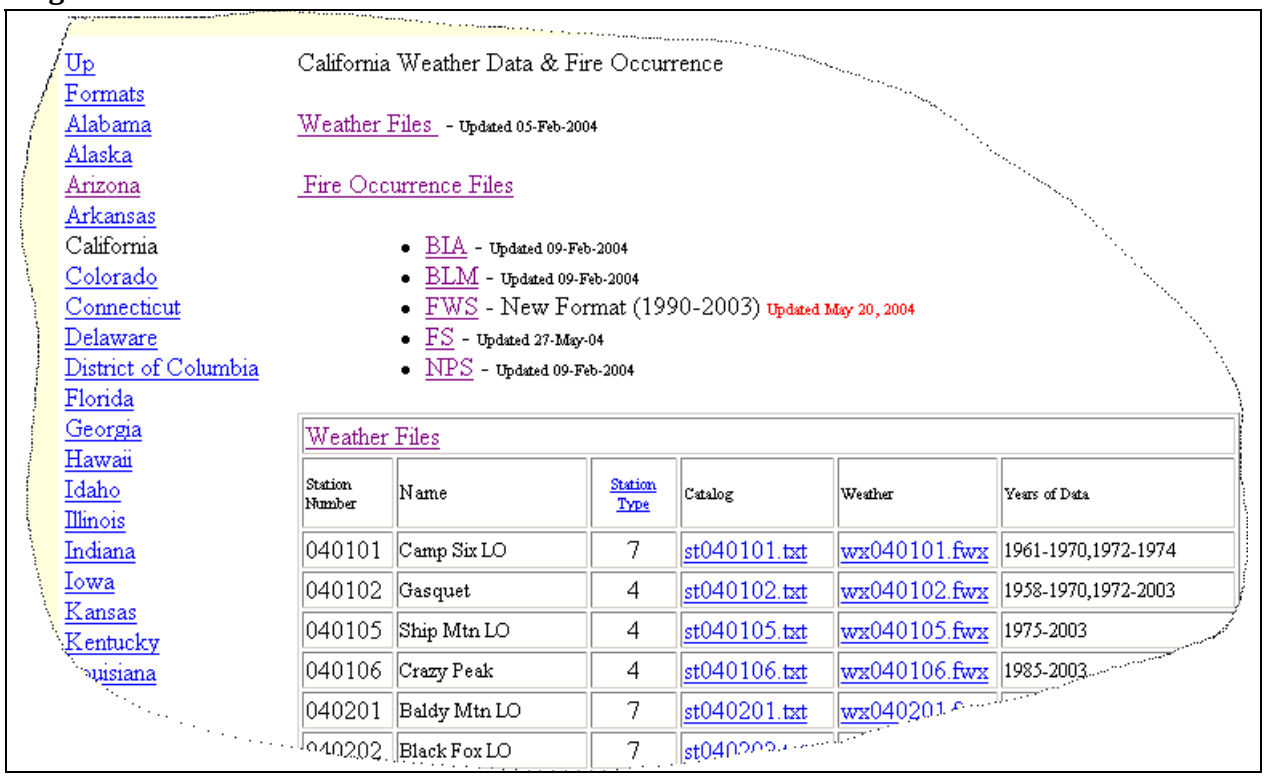
http://famweb.nwcg.gov/weatherfirecd/

Figure 24



Select the state and then weather stations from which the weather observations will be downloaded. These files, on the Internet site, include station catalog attributes (NFDRS catalog information) and weather data sets. The time period that weather data is available varies by weather station. The years available are noted in the last column on the Internet site (Figure 25).

Figure 25



Up
Formats
Alabama
Alaska
Arizona
Arkansas
California
Colorado
Connecticut
Delaware
District of Columbia
Florida
Georgia
Hawaii
Idaho
Illinois
Indiana
Iowa
Kansas
Kentucky
uisiana

California Weather Data & Fire Occurrence

Weather Files - Updated 05-Feb-2004

Fire Occurrence Files

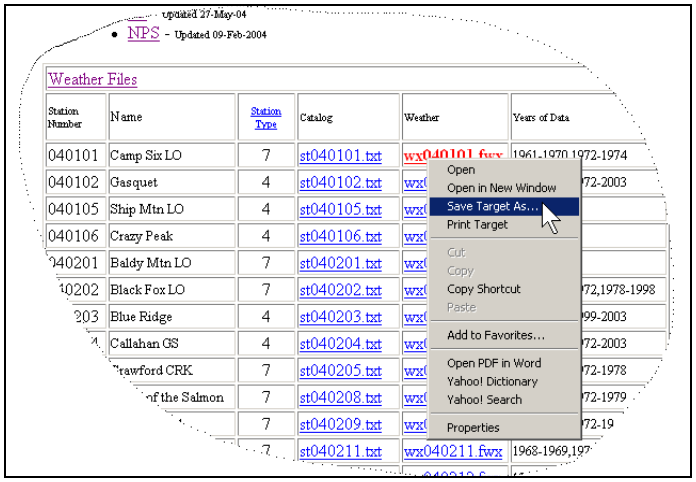
- BIA - Updated 09-Feb-2004
- BLM - Updated 09-Feb-2004
- FWS - New Format (1990-2003) Updated May 20, 2004
- FS - Updated 27-May-04
- NPS - Updated 09-Feb-2004

Weather Files

Station Number	Name	Station Type	Catalog	Weather	Years of Data
040101	Camp Six LO	7	st040101.txt	wx040101.fwx	1961-1970,1972-1974
040102	Gasquet	4	st040102.txt	wx040102.fwx	1958-1970,1972-2003
040105	Ship Mtn LO	4	st040105.txt	wx040105.fwx	1975-2003
040106	Crazy Peak	4	st040106.txt	wx040106.fwx	1985-2003
040201	Baldy Mtn LO	7	st040201.txt	wx040201.f	
040202	Black Fox LO	7	st040202.t		

When downloading a *.fwx, the user should right click on **File => Save Target As** in Windows Explorer (Figure 26).

Figure 26



updated 27-May-04
NPS - Updated 09-Feb-2004

Weather Files

Station Number	Name	Station Type	Catalog	Weather	Years of Data
040101	Camp Six LO	7	st040101.txt	wx040101.fwx	1961-1970,1972-1974
040102	Gasquet	4	st040102.txt	wx	72-2003
040105	Ship Mtn LO	4	st040105.txt	wx	
040106	Crazy Peak	4	st040106.txt	wx	
040201	Baldy Mtn LO	7	st040201.txt	wx	
0202	Black Fox LO	7	st040202.txt	wx	72,1978-1998
203	Blue Ridge	4	st040203.txt	wx	99-2003
	Callahan GS	4	st040204.txt	wx	72-2003
	rawford CRK	7	st040205.txt	wx	72-1978
	f the Salmon	7	st040208.txt	wx	72-1979
		7	st040209.txt	wx	72-19
		7	st040211.txt	wx040211.fwx	1968-1969,197

Open
Open in New Window
Save Target As...
Print Target
Cut
Copy
Copy Shortcut
Paste
Add to Favorites...
Open PDF in Word
Yahoo! Dictionary
Yahoo! Search
Properties

Navigate to the folder the file will be downloaded to using Windows Explorer. Be sure to note this folder location.

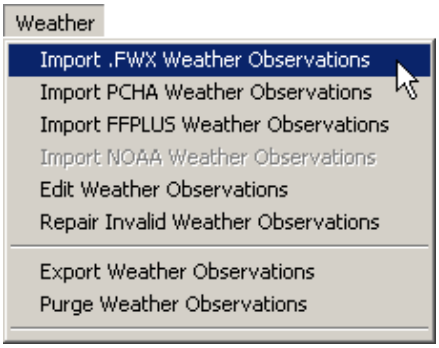
Obtaining GRID Weather Data Records

Reserved. To be completed at a later date.

Import .FWX Weather Observations

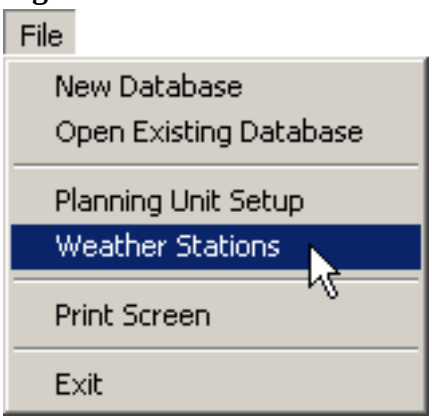
The weather records for each weather station must be in separate files (one file per station).

Figure 27



Before these weather observations can be imported to PCHA, the weather station attributes must defined using the **File => Weather Stations** menu (Figure 28). See the description of this menu item for details.

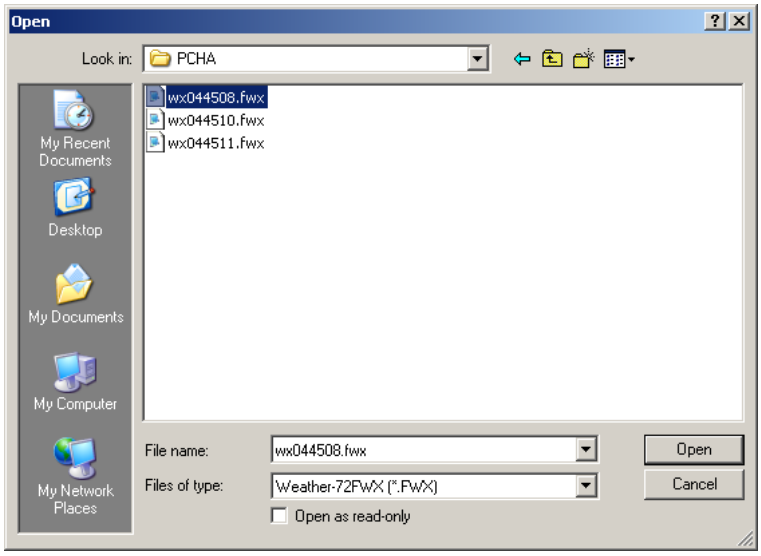
Figure 28



The ASCII file naming convention requires that the last six characters of the file name to be the weather station identifier. Weather observation files downloaded from the FAMWEB Internet site will have the first two characters of the file name WX and the file extension will be fwx. The file extension must be fwx (Figure 29).

GRID weather files should be named using this convention. It is recommended the six-character "station name" be related to the FMU name it is being assigned to.

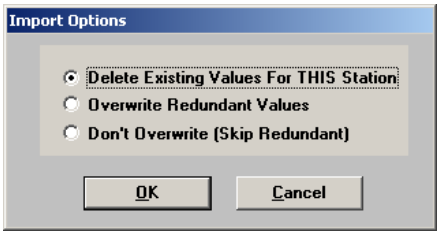
Figure 29



When the planner selects **Weather => Import .FWX Weather Observations**, a dialog box similar to the one in Figure 29 appears. It will be necessary to navigate to the folder where the weather observation files have been saved. Once there, the dialog will list files with the .fwx extension. The planner can either double click on the file name, or click once to highlight the file name and then click **OK**.

The screen in Figure 30 will appear. The planner must choose one of the three options listed on the screen.

Figure 30



Delete Existing Values For THIS Station
The default option deletes all weather records for this station that currently exist in PCHA. Use this option to delete all existing records from the database and import a new weather data set.

Overwrite Redundant Values
This option imports new weather observations and replaces a weather observation in the PCHA database by a new observation if one exists in the ASCII weather observation file.

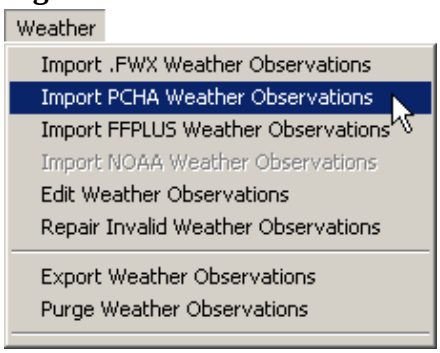
Don't Overwrite (Skip Redundant)
This option does not delete duplicate observations so it is possible for there to be more than one weather observation for the same day. Use this option to add new records to the database, but keep all the existing records without changing them.

After an option is selected, click **OK** to start the import process. A progress bar will appear along the bottom of the screen. There is another Cancel button in case one wishes to stop the import part way through the process.

Importing from a PCHA Database

All weather station attributes and weather observation records that exist in a PCHA database can be imported to a new PCHA database. This option would be of value if weather observations had been imported and verified in a past planning effort that used PCHA.

Figure 31



Selecting **Weather => Import PCHA Weather Observations** will result in the screen in Figure 32 appearing. Clicking **Browse** will result in the screen in Figure 33 appearing.

Figure 32

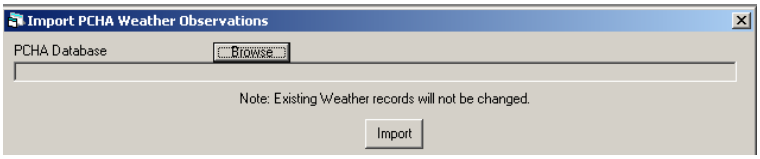
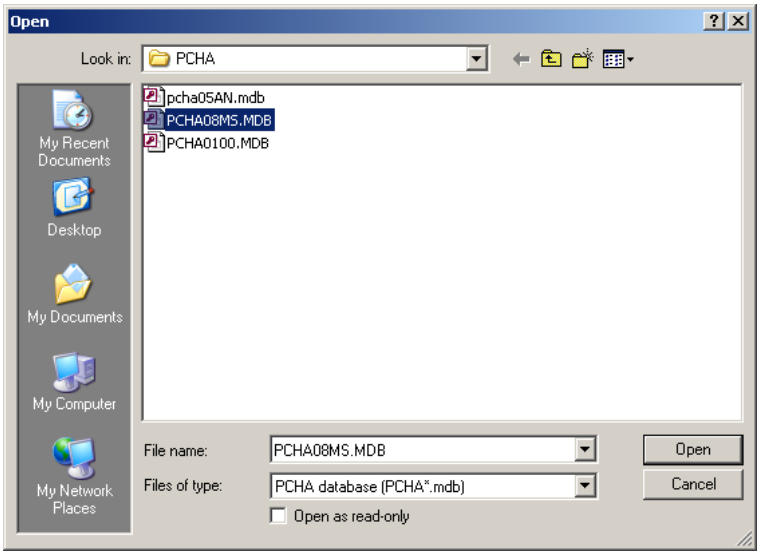


Figure 33



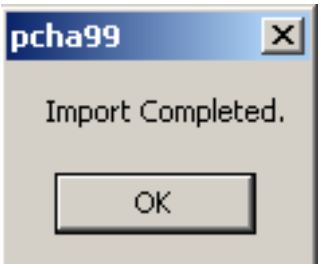
It will be necessary to navigate to the folder where the PCHA database file has been saved. Once there, the dialog will list files with the .mdb extension. The planner can either double-click on the file name, or click once to highlight the file name and then click **OK**. The screen in Figure 34 will appear.

Figure 34

Notice the path to the file is shown. If the correct file has been selected, click **IMPORT**. Be aware that all weather stations and weather observations in the PCHA database selected will be imported once the **IMPORT** button is clicked.

When all weather station attributes and weather records have been imported, PCHA will display the screen in Figure 35.

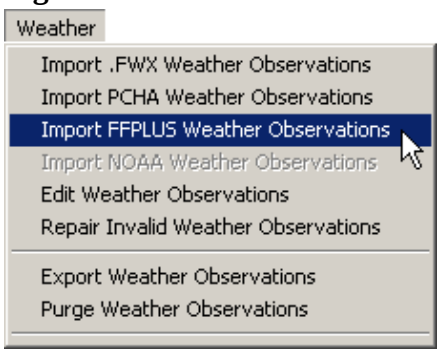
Figure 35



Importing from a FireFamily Plus Database

All weather station attributes and weather observation records that exist in a FireFamily Plus database can be imported to a new PCHA database. This option would be of value if weather observations had been imported and verified in a past planning effort that used FireFamily Plus.

Figure 36



Selecting **Weather => Import FFPLUS Weather Observations** will result in the screen shown in Figure 37. Clicking **Browse** will result in the screen shown in Figure 38.

Figure 37

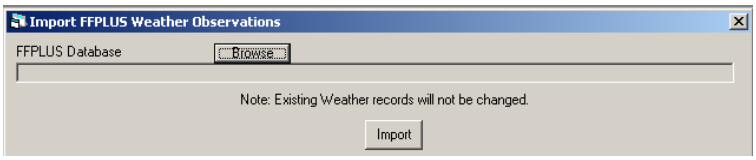
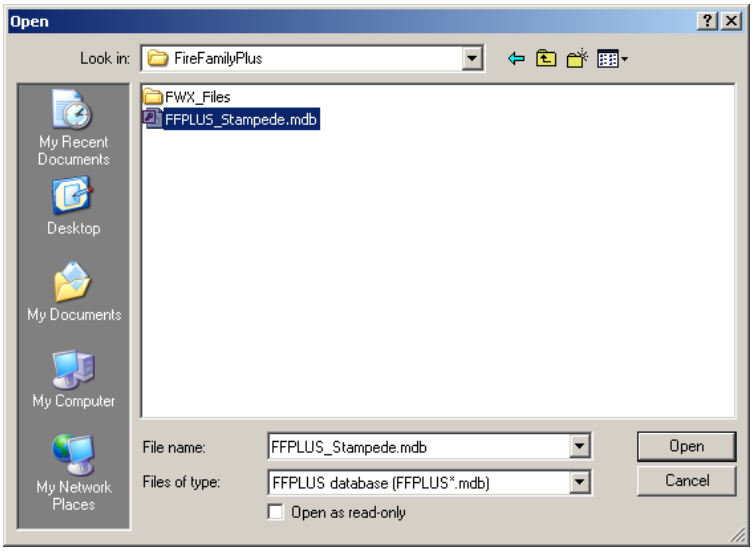


Figure 38



It will be necessary to navigate to the folder where the FireFamily Plus database file has been saved. Once there, the dialog will list files with the .mdb extension. The planner can either double-click on the file name, or click once to highlight the file name and then click **OK** . The screen in Figure 39 will appear.

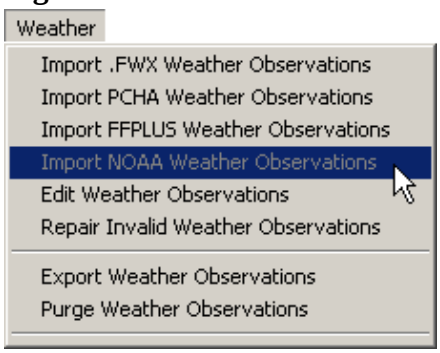
Figure 39

Notice the path to the file is shown. If the correct file has been selected, click IMPORT. Be aware that all weather stations and weather observations in the FireFamily Plus database selected will be imported once the IMPORT button is clicked. When all weather station attributes and weather records have been imported, PCHA will display the screen in Figure 35.

Importing NOAA Weather Observation

Reserved. To be completed at a later date.

Figure 40



Edit Weather Observations

After importing the weather data, it needs to be checked for errors and missing observations. Some observations may be incomplete or there may be significant gaps in the weather observations. Data fields in individual weather records can be edited. If a data field in a weather record is an estimated field value, be sure to check the User-Estimated Weather box. Weather records can be added to fill gaps. Selecting the **Weather => Edit Weather Observations** menu will result in the screen in Figure 42 being displayed.

Figure 41

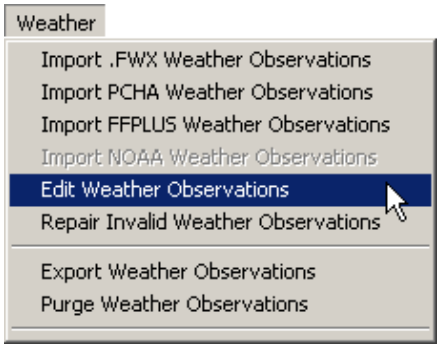
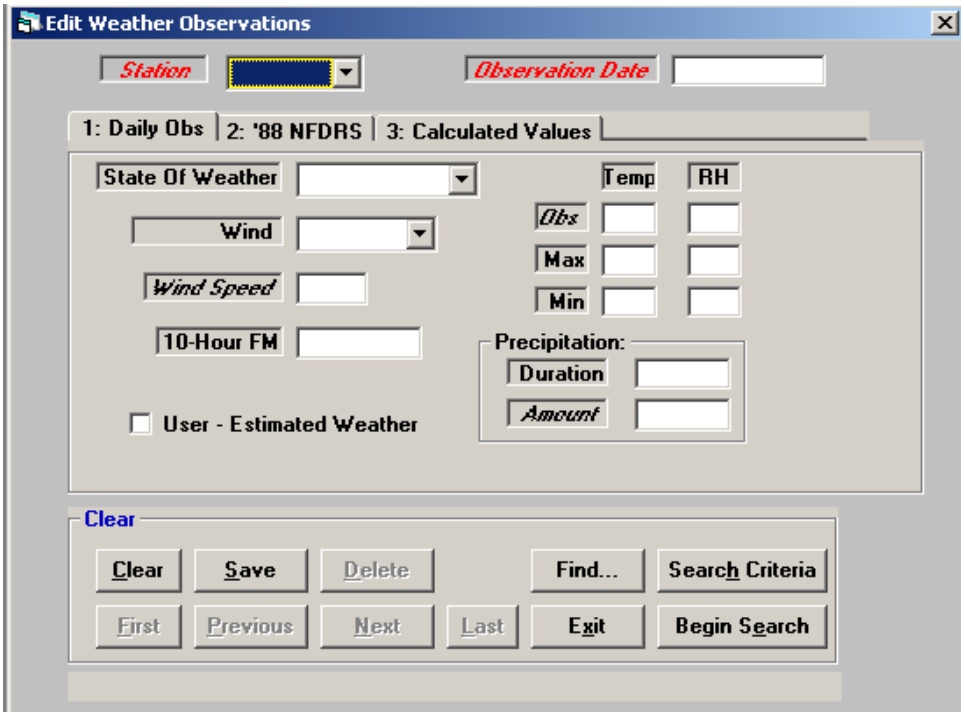
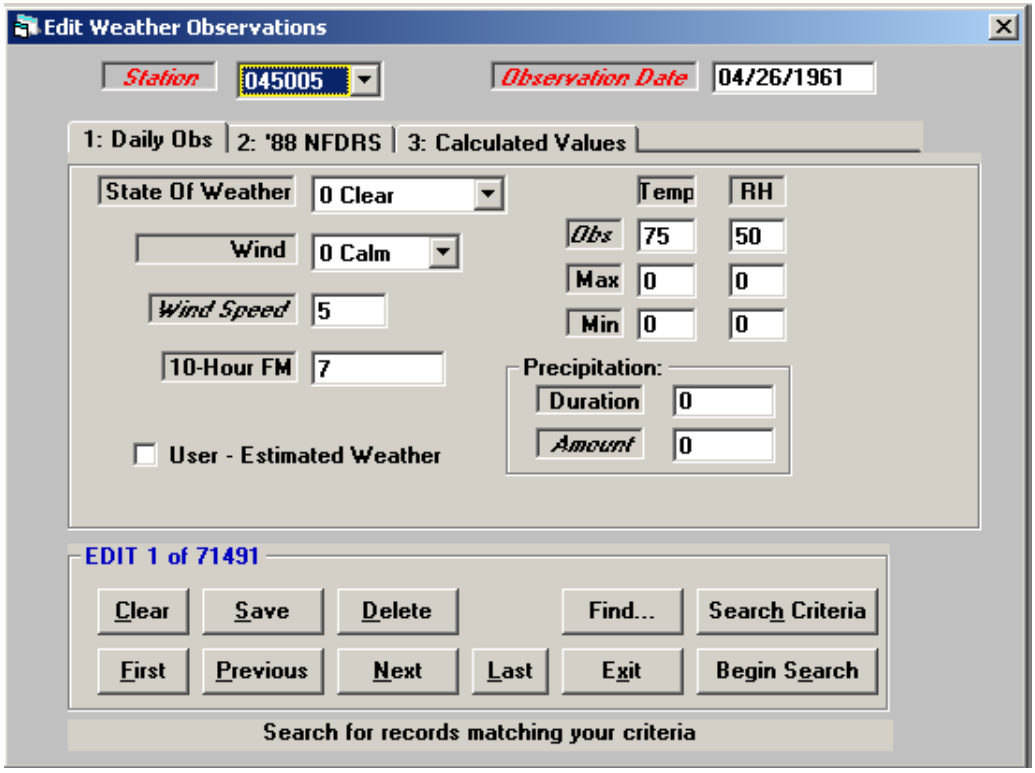


Figure 42 – Edit Weather Observations Screen



Displaying a Weather Records for a Station
Use the Station pull-down to select a weather station. Do a left mouse click on the **Clear** button followed by a left mouse click on the **Begin Search** button. A screen similar to the one shown in Figure 43 will be displayed.

Figure 43 – Daily Weather Tab



Top of Weather Screen
The station number and observation date are always visible so the planner knows which weather station and observation date are displayed.

Station ID
This field shows the weather station or GRID weather data set identifier. This field is searchable for specific records or groups of records as described under the **Search Criteria** button.

Observation Date
This field is the date of the weather observation. A planner can search for observations on specific dates or a range of dates in searches as described under the **Search Criteria** button.

Daily Observations Tab (Daily Obs)
The screen in Figure 43 shows the content of the **Daily Observation** tab on the **Edit Weather Observations** screen. The fields on this tab contain the values for each variable for the observation date. The definitions of the fields are as follows:

State of Weather
State of Weather indicates the amount of cloud cover, kind of precipitation, and/or restrictions to visibility at the weather station at the observation time. Table 7 shows the State of Weather definitions.

Table 7 – State of Weather Definitions

Code	Definition
1	Scattered clouds
2	Broken clouds
3	Overcast
4	Foggy
5	Drizzling
6	Raining
7	Snow or sleet
8	Showering
9	Thunderstorms in progress

Wind Direction
This field shows the direction from which the wind blew at the observation time coded into one of 8 directions. Table 8 shows the wind direction definitions.

Table 8 – Wind Direction Definitions

Code		Definition
0	---	Calm
1	NE	Northeast
2	E	East
3	SE	Southeast
4	S	South
5	SW	Southwest
6	W	West
7	NW	Northwest
8	N	North

Wind Speed
Wind speed in miles per hour is a 10-minute average measured at 20-feet above the average height of the vegetative cover.

10h Timelag Fuel Moisture (10-Hour FM)
This is the moisture content of the 0.26 – 1.00 inch dead and down fuels. Frequently, it is measured by weighing calibrated fuel sticks.

Temperature (Temp)
This field is the dry bulb temperature measured in degrees Fahrenheit.

Relative Humidity (RH)
Relative humidity, expressed as a percent, is the proportion of amount of water in the air to the amount of water at saturation given the same temperature and barometric pressure.

Precipitation
Precipitation is expressed both in the amount and the duration.

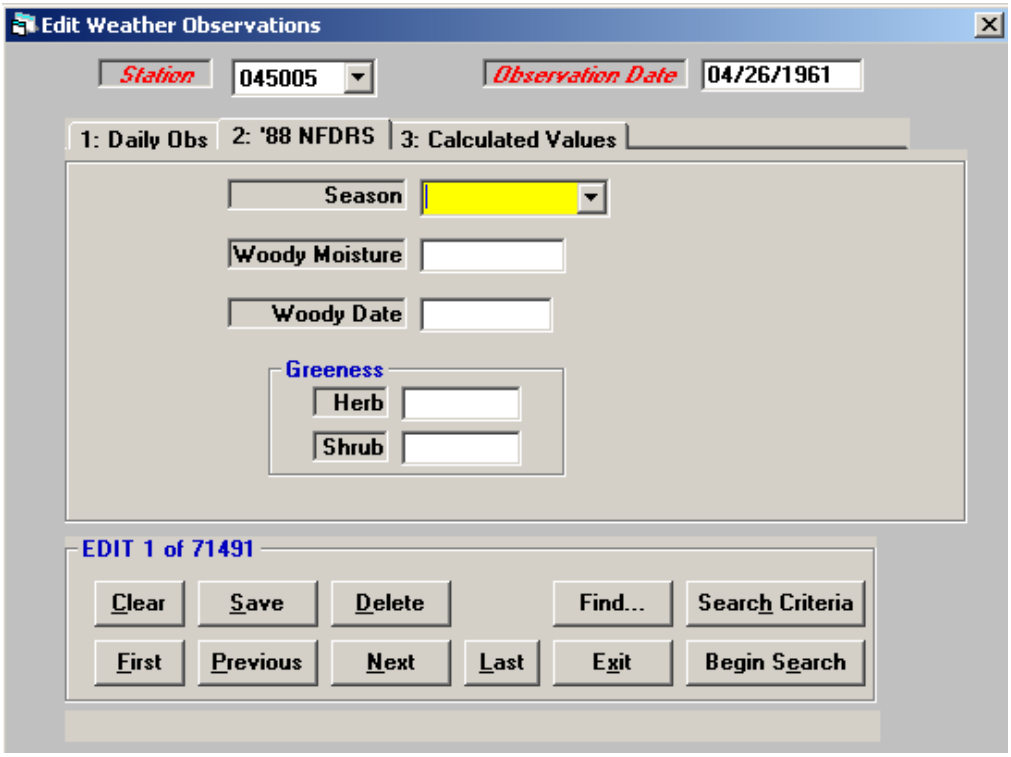
Precipitation Duration
Precipitation duration is the time expressed in hours that measurable precipitation events lasted during the previous 24-hour period.

Precipitation Amount
Precipitation amount is the amount of atmospheric moisture that reached the ground within the previous 24-hour period.

User-Estimated Weather
If the planner enters an estimated value for any field in the weather record for the observation date, check this box.

1988 NFDRS Tab
The data on the NFDRS tab shows the additional data required to support the 1988 version of NFDRS (Figure 44).

Figure 44 – '88 NFDRS Tab



Season
This field identifies one of the four seasons of the year. Options are Unknown, Winter, Spring, Summer or Fall.

Woody Moisture
This is the moisture content of woody (shrub) fuels. Values can range up to 250 percent.

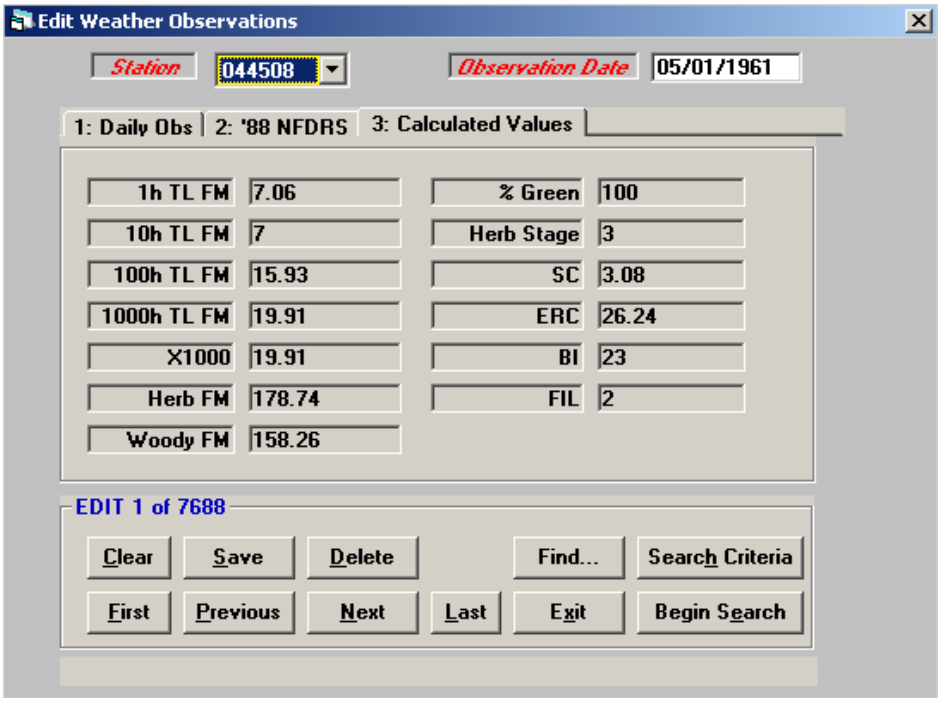
Woody Date
This field is the observation date of the woody fuel moisture.

Greenness
This is the greenness factor from 0 through 20 that indicates the relative level of shrub greenness. Zero indicates that all leaves have fallen off deciduous shrubs or that evergreen shrubs are dormant. Twenty indicates fully developed shrub leaves that are not under moisture stress. Use intermediate values during spring greenup, fall curing, or during drought conditions.

There are separate entries for herbaceous greenness and shrub greenness.

Calculated Values Tab
The data on this tab shows the calculated values for the national fire danger rating system based on the weather observation. The calculations use the 1978 NFDRS formulas unless the Use 88 NFDRS box on the weather station definition screen was checked (Figure 45).

Figure 45 – '88 NFDRS Tab



1-h Timelag Fuel Moisture (1-h TH FM)
Observation time, relative humidity, and temperature measured at 4.5-feet above the ground are the weather values used to calculate the 1-h timelag fuel moisture. Observed weather values are adjusted from a 4.5-foot observation to an estimated condition at ground level using factors determined by the State of Weather codes.

10-h Timelag Fuel Moisture (10-h TH FM)
The preferred method to obtain the 10-h timelag fuel moisture is to weigh fuel moisture sticks at the weather station. When fuel sticks are not measured, the 10-h timelag fuel moisture is estimated in a manner similar to that for the 1-h timelag fuel moisture.

100-h Timelag Fuel Moisture (100-h TH FM)
The 100-h timelag fuel moisture is determined from the weather observation values of precipitation duration, maximum and minimum temperature and relative humidity. The maximum and minimum values are for the 24-hour period that begins at observation time yesterday (in relation to the weather record date) and ending at observation time today.

1000-h Timelag Fuel Moisture (1000-h TH FM)
The 1,000-hour timelag fuel moisture calculation uses the same basic methodology as the 100-hour timelag fuel moisture but bases calculations on conditions over a seven-day (168 hours) period.

X1000 Value (X1000)
The X1000 value limits the increase in herbaceous fuel moisture due to precipitation. The 1,000-hour timelag fuel moisture controls the drying rate of herbaceous fuel moisture and the X1000 value controls the rate of increase of herbaceous fuel moisture content due to precipitation.

Herbaceous Fuel Moisture (Herb FM)
Plants that do not develop persistent woody tissues such as grasses, forbs and ferns are live herbaceous fuels. These fuels are further subdivided into annual and perennial vegetation types. The herb fuel moisture is estimated using National Fire Danger Rating System (NFDRS) calculations. When the fuel moisture falls below 30 percent, these plants are considered cured and the moisture content defaults to that of the 1-h timelag fuels.

Woody Fuel Moisture (Woody FM)
Plants that develop persistent woody tissue such as shrubs are live woody fuels. These fuels are considered dormant when the moisture content falls to 50 percent. Maximum moisture content during the growing season is 250 percent.

Percent Green (% Green)
The 1988 NFDRS requires users to enter greenness factors that express actual greening and curing of both live herbaceous and live woody vegetation. Greenness factors represent a visual estimate of the current general greenness of herbs and grasses, and shrubs, compared with their maximum greenness. The greenness factors range from 0 to 20. Zero (0) represents fully dried herbaceous plants or dormant shrubs, and 20 represents a condition in which the herbs and/or shrubs are as green as they can ever get.

Herbaceous Stage (Herb Stage)
There are four herbaceous stages in the live moisture fuel model. These stages are cured, greenup, green and transition. Each stage is utilized in the model to determine fuel load transfer from live herbaceous to dead 1-hour timelag fuel moisture. The affect on live fuels is as follows:

Cured
All live herbaceous fuel loading is transferred to 1-hour timelag fuel category (1-h TL FL).

Greenup
During this stage, the herbaceous fuel load that is 100% in the 1-h timelag dead category is transferred back to the live herbaceous category as the live fuel moisture. When the live fuel moisture reaches 125 percent, the entire herbaceous fuel load is in the live herbaceous category.

Green
All herbaceous fuel loading is in the live herbaceous category.

Transition
During transition, live fuel load is progressively transferred from the live category to the 1-h timelag fuel load category as the live herbaceous fuel moisture moves from 125% to 30%.

Spread Component (SC)
The Spread Component is an index calculated in a manner very similar to the calculation of the rate of spread in the Fire Behavior Prediction System. It is expressed in feet per minute and is calculated using the NFDRS fuel model attribute of the weather station.

Energy Release Component (ERC)
This value is based on the estimated potential available energy released per unit area in the flaming zone of the fire. The ERC is dependent on the same fuel characteristics as the Spread Component. The day-to-day variations of the ERC are caused by changes in the moisture contents of the various fuel classes including the 1,000-hour timelag fuel moisture class. The ERC is derived from predictions of the rate of heat release per unit area during flaming combustion and the duration of flaming.

Burning Index (BI)
The Burning Index is derived from the Spread Component and Energy Release Component. The rate of fire spread and the energy released in the flaming zone, considered together, are the means of rating the difficulty of containment. The BI is linearly related to the length of flames at the head of the fire.

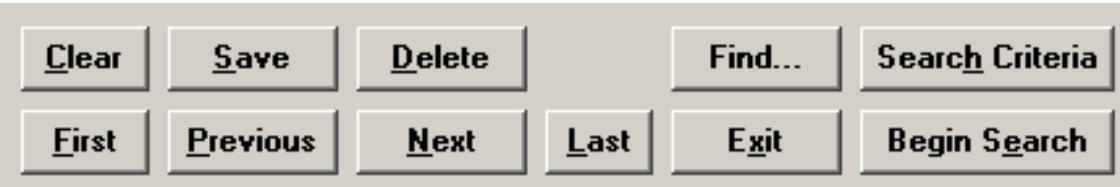
Fire Intensity Level (FIL)
The Fire Intensity Level is a measure of fire intensity as it influences fire effects (rather than fire behavior) and is represented by flame length. The six FIL categories and their associated flame lengths are listed in Table 9.

Table 9 – FIL Definitions

FIL	Flame Length
1	0 – 2.0 feet
2	2.1 – 4.0 foot
3	4.1 – 6.0 feet
4	6.1 – 8.0 feet
5	8.1 – 12.0 feet
6	12.1+ feet

Bottom of Edit Weather Screen
All of these buttons are usable from any of the tabs to enter a new record or a search.

Figure 46



Save Button
The **Save** button saves the information for the active date to the PCHA database. Until this button is clicked, any changes made in fields are not permanently saved to the PCHA database.

Clear Button
The **Clear** button resets all data field to blank.

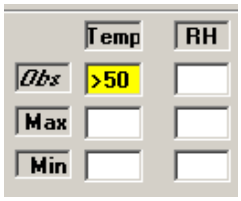
Delete Button
This button deletes the current record from the database. If there are no weather observation records in the database or displayed on the screen, this button will be light gray and inoperative.

Begin Search Button
Click **Begin Search** to find the first weather observation record in the database or the first record that meets the defined search criteria.

Search Criteria Button

Click **Search Criteria** to clear the screen and define the fields that will control which weather observation records to find in the database. Fields with their names written in italic text are available for searches. Station ID, observation date, precipitation, wind speed, precipitation amount, observed temperature, and observed relative humidity are search fields. After the criteria are entered, click **Begin Search**.

Figure 47



For example, a planner can search for all observations with temperatures greater than 50. Click **Search Criteria** then click in the Obs Temp field. Enter the critarion >50 and click **Begin Search**.

To find precipitation events between 2 inches and 10 inches, click **Search Criteria** . Click in the Precipitation Amount field and enter >=2.0 and <=10.0. Click **Begin Search**. This search will find all weather observations that have between 2 inches and 10 inches of precipitation for the day.

First, Previous, Next, and Last Buttons

The **First** button displays the first weather observation record in the database or the search list. The **Previous** and **Next** buttons display the weather observation before or after the current observation. The **Last** button displays the last observation in the database or search list. These buttons show light gray if there are no weather observation records in the database or displayed on the screen.

Find Button

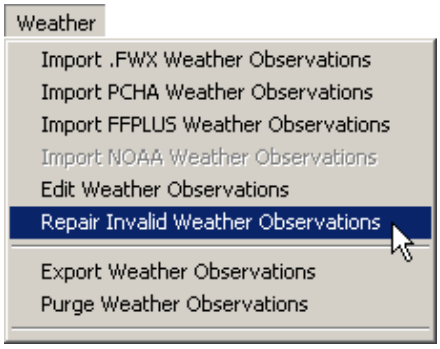
Unlike the **Search Criteria** and **Begin Search** buttons, which retrieve a set of records for viewing, the **Find** button is used to jump to desired records within those already retrieved with **Begin Search**. Click **Find** and then select **Clear** from the pop-up menu. This will clear all fields. Enter the values to determine which record is desired, then click **Find** and select **Find** from the pop-up menu. To move from record to another similar record after a **Find** command, click **Find** and then select **Next** or **Previous** from the pop-up menu.

Exit Button

The **Exit** button closes the weather observation edit screen and returns to the main PCHA screen.

Repair Invalid Observations

Figure 48



This function will review all the weather records and correct weather records that have certain incorrect information. A box will pop up and will ask for confirmation of whether to proceed. The status bar across the bottom shows progress through the weather records.

After PCHA finishes the repairs, a display box will pop up with the message "xxx invalid weather observations were written to file INVWX.DAT." The INVWX.DAT is a text file saved in the folder where PCHA is installed. The report can be viewed by clicking **OK** . Clicking on **Print** will print the report.

The planner can scroll through the report by moving the scroll bars on the right and bottom. The report lists station number, observation date, field name affected, original value, new value, and a description of the problem.

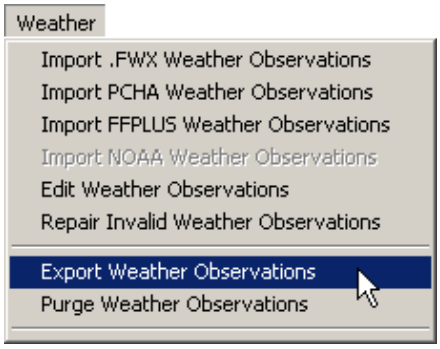
Errors corrected include:

- Maximum humidity less than yesterday or today's observed relative humidity. Maximum relative humidity is set to the greater of yesterday or today's relative humidity.
- Minimum humidity greater than yesterday's or today's observed relative humidity. Minimum relative humidity is set to the lesser of yesterday or today's relative humidity.
- Maximum temperature is less than yesterday or today's observed temperature. Maximum temperature is set to the greater of yesterday or today's temperature.
- Minimum temperature is greater than yesterday or today's observed temperature. Minimum temperature is set to the lesser of yesterday or today's temperature.
- Maximum relative humidity is less than minimum relative humidity. Maximum and minimum relative humidity values are swapped.
- Maximum temperature is less than Minimum temperature. Maximum and minimum values are swapped.

Export Weather Observations

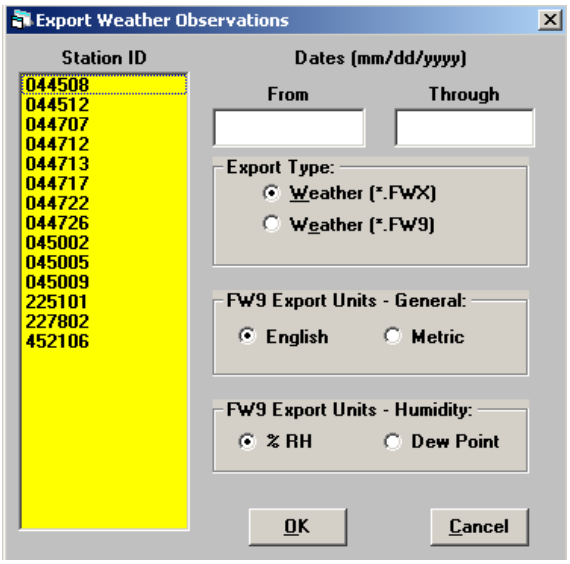
The menu item allows the planner to export in either fwx or fw9 format weather records. Each weather station needs to be exported separately. Choose the station number, date range, and file type for each export.

Figure 49



Selecting **Weather => Export Weather** will cause a screen similar to the one shown in Figure 50 to be displayed.

Figure 50



Station ID

PCHA will list the stations defined in the database. Choose the station desired to export.

Dates

Enter the beginning and ending dates to export in the From and Through boxes. Enter the dates in mm/dd/yyyy format. PCHA will export only the weather observations for the requested station whose observation date falls between the two dates.

Export Type

FWX (Short observation)

This is the same format as the PCHA import file format.

FW9 (WXOBS98)

This is the Y2K compliant format.

Purge Weather Observations

This option will remove selected sets of previously imported weather observations. Selecting the **Weather => Purge Weather Observations** produces the screen in Figure 52.

Figure 51

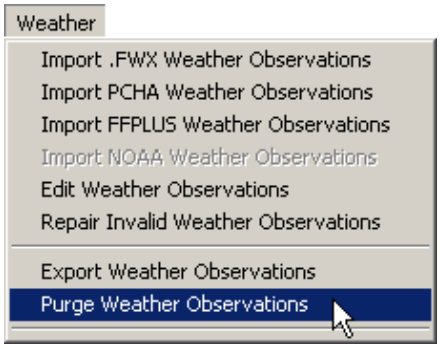
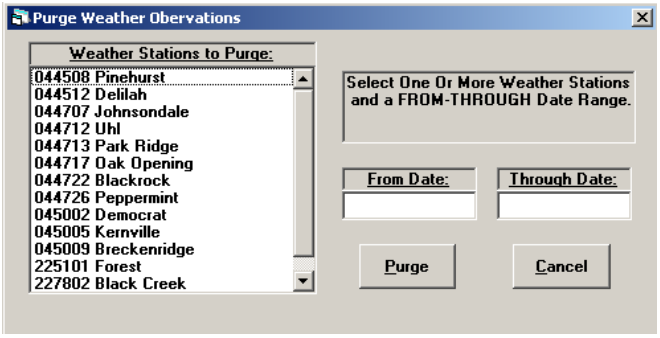


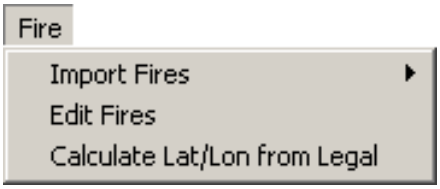
Figure 52



The user can select one or more weather stations and a range of weather observations to be deleted from the PCHA database. The From Date is the first weather observation (month, day and year) that is to be deleted and the Through Date (month, day and year) is the last weather observation that is to be deleted. All weather observations for the selected station(s) between the From and Through Dates will be deleted when the **Purge** button is selected. The From and Through date range format is mm/dd/yyyy.

The Fire Menu

Figure 53 – The Fire Menu



This menu item provides functions available to manage fire data. **Import Fires** loads fire data into the PCHA database. **Edit Fires** allows the planner to verify and modify fields in a fire occurrence record. A utility exists to calculate the latitude and the longitude for a fire from the legal location (Township, Range and Section). Reports help to find problems in the data, and clean data can be exported for further use.

Obtaining Fire Occurrence Records

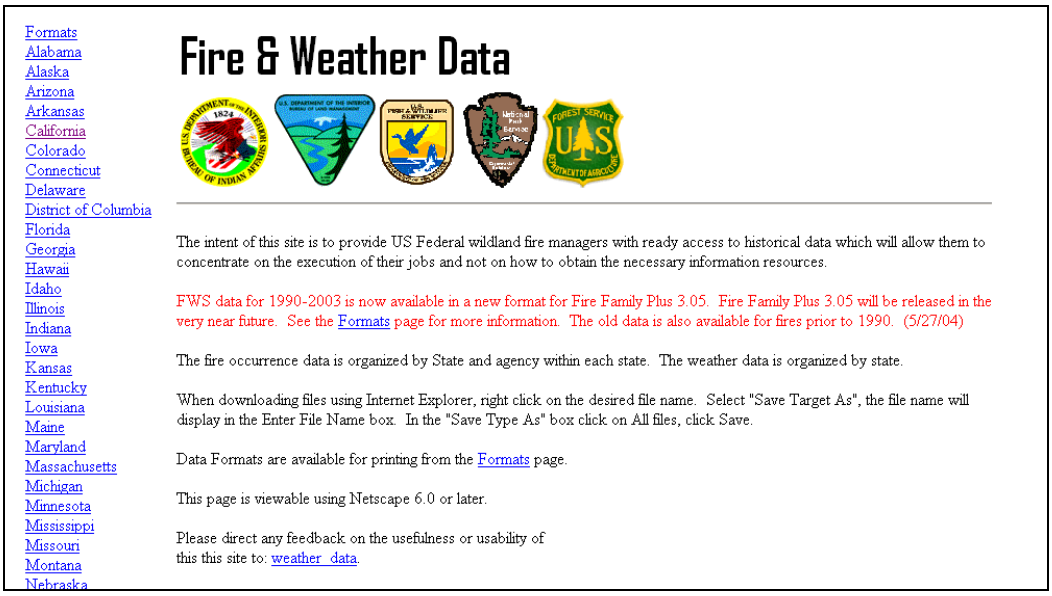
The fire planner must obtain fire occurrence records. Several sources are available.

Obtaining Federal Agency Fire Occurrence Records from the Internet

Historic fire occurrence records for the USDA Forest Service and the USDI Bureau of Land Management, Bureau of Indian Affairs, Fish and Wildlife Service and the National Park Service are available from the FAMWEB Internet site at the URL:

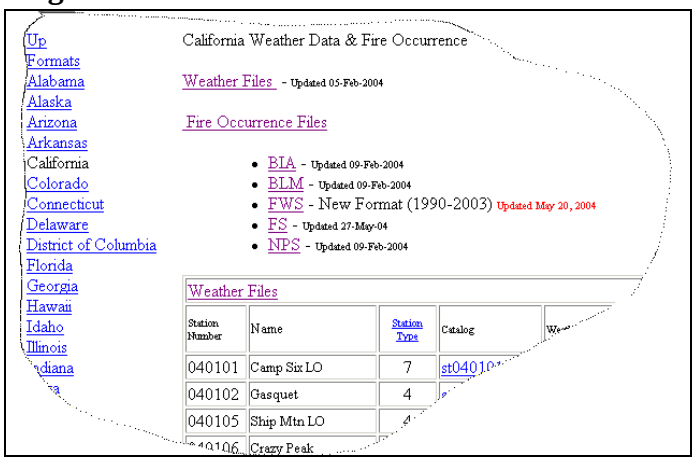
http://famweb.nwcg.gov/weatherfirecd/

Figure 54



Select the state and then agency. These files, on the Internet site, include fire occurrence for each agency's corporate fire occurrence database. The time period that fire occurrence records are available varies by organizational unit. The years available are noted on the Internet site.

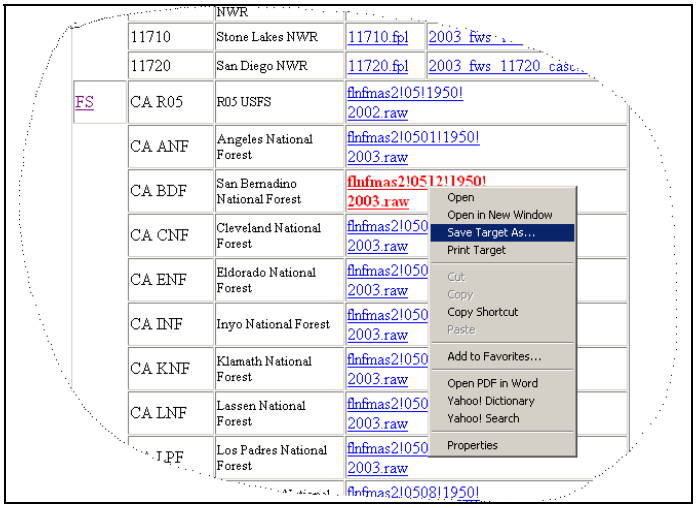
Figure 55



When downloading a fire occurrence data file, the user should right click on **File => Save Target As** in Windows Explorer.

Using Windows Explorer, navigate to the folder the file will be downloaded to. Be sure to note this folder's location.

Figure 56



Obtaining Other Agency Fire Occurrence Records

For other agencies participating in an analysis, consult with that agency's fire planning personnel for availability of historic fire occurrence records. Import of these records is possible if the records are available in an ASCII file format support for import to PCHA. These formats are discussed in the following section.

There may be some agencies participating in the FPU that have entered fire occurrence data into the NFIRS fire report database system. The U. S. Fire Administration, an agency in FEMA, has developed this fire report system. Information about the wildland fire report module of NFIRS (NFIRS-8) is available at www.nfirs.fema.gov. The National Fire Information Council (NFIC) has developed NFIRS under contract from the U. S. Fire Administration. Information about the NFIC can be found at www.nfic.org. There may be an import menu selection built into PCHA for NFIRS fire report data at some future date. Any existing NFIRS fire occurrence data can be imported into PCHA using the PCHA Standard Fire Import Format process. The NFIRS wildland fire report module has only been operational for a few years. There may be some Eastern or Midwest state agencies, local fire departments, rural or volunteer fire departments that may have some fire occurrence data in NFIRS.

Import Fires

To import fire occurrence records to PCHA, select **Fire => Import Fires.** The fire occurrence records must be in one of the formats shown in Table 10. The required file name and extension for each file format is also shown in Table 10.

Figure 57

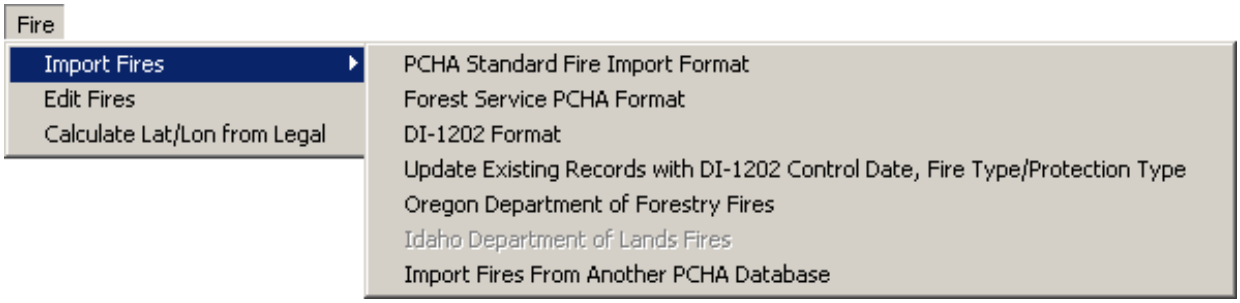


Table 10

File Formats	Required File Naming Convention
PCHA Standard Fire Import Format	*.PCHAFIRES
Forest Service PCHA Format	*.RAW
DI-1202 Format	*.fpl
Update Existing Records with DI-1202 Control Date, Init Date and FT/PT	*.fpl
Oregon Department of Forestry Fire	ODF*.FIRES
PCHA Transfer Format	*.mdb
Import Fires from Another PCHA Database	PCHA*.mdb

Description of File Formats

A description of each of the fire occurrence file formats.

PCHA Standard Fire Import Format

States and local agencies may also be participating in the analysis process. Each agency will have its own fire report format and historic data may exist in an electronic format. PCHA cannot support all the possible import formats. It is recommended that the planner work with these agencies to create an ASCII file with the data from the fire occurrence records. This ASCII file should be in the PCHA Standard Fire Import Format. Table 11 contains a description of the fields in the comma-delimited ASCII PCHA standard file format. The ASCII file must have a *.PCHAFIRES file extension.

Table 11 – PCHA Standard Import Format File Definition

Field ID	Required For Import	Needed For FPA	Type	Width	Example	Use
1	X	X	Integer	4	2004	Discovery Year
2	X	X	Integer	2	12	Discovery Month
3	X	X	Integer	2	30	Discovery Day
4		X	Integer	4	1552	Discovery Time
5			Text	20	“HORSE THIEF #2”	Fire Name
6	X		Text	6	B072	Fire Number
7			Text	2	SW	Region Identifier
8			Text	3	13A	Unit Identifier
9			Text	2	CA	State
10		X	Integer	1	6	Statistical Cause Code
11		X	Integer	2	44	North Latitude Degrees
12		X	Integer	2	58	North Latitude Minutes
13		X	Real	2.4	21.8901	North Latitude Seconds
14		X	Integer	2	119	West Longitude Degrees
15		X	Integer	2	28	West Longitude Minutes
16		X	Real	2.4	14.7992	West Longitude Seconds
17		X	Integer	4	2004	Control Year
18		X	Integer	2	12	Control Month
19		X	Integer	2	30	Control Day
20			Integer	4	1942	Control Time
21		X	Integer	2	20	Slope Percent
22		X	Integer	6	5914	Elevation (Feet)
23			Text	1	G	NFDRS Fuel Model
24			Real	8.2	6129.25	Total Acres Burned
25			Text	240	“Report By John”	Remarks

An example row from the comma-delimited ASC file in the Standard PCHA Fire Format is shown in Figure 58. Notice that fields 5 and 26 contain spaces in the example entries. As such the data in these fields is contained in quotation marks.

Figure 58 – Example of a Fire Record in the Standard PCHA Fire Format

```
2004,12,30,1552,“Horse Thief 2",B072,SW,13A,CA,6,44,58,21.8901,119,28,14.7992,2004,12,30,1942,20,5914,G,6129.25,"Report by Frank”
```

The statistical fire cause and the aspect codes to be used in fields 10 and 33 are shown in Tables 12 and Table 13.

Table 12 – Statistical Fire Causes

Code	Cause
1	Lightning
2	Equipment Use
3	Smoking
4	Campfire
5	Debris Burning
6	Railroad
7	Arson
8	Children
9	Miscellaneous

Table 13 – Aspect Codes

Code	Aspect
0	Flat
1	North
2	Northeast
3	East
4	Southeast
5	South
6	Southwest
7	West
8	Northwest
9	Ridgetop

Forest Service PCHA Format

Forest Service PCHA data files use the naming convention PCHArrff.RAW where rr is the region and ff is the forest number. The first four characters must be PCHA and the file extension must be RAW. For example, the input file for the Angeles NF in Region 5 would be PCHA0501.RAW.

Some fields contain data that is valid in the agency database, but is not valid in PCHA. One item in particular--NFDRS fuel model--may contain fuel model “X” in Forest Service data, but PCHA converts fuel model 'X' to a blank during the import process. The format for the Forest Service PCHA file is contained in the Appendix.

DI-1202 Format

The DI-1202 data files use the naming convention *.fpl where the * represents any series of legal file naming characters.

Update Existing Records with DI-1202 Control Date, Fire Type / Protection Type

Department of Interior (DOI) fire records may have been imported to a legacy PCHA database using the BLM and BIA import formats. These formats did not include import of the control date or fire type/protection type. This menu allows for updating of the DOI fire report records after they have been imported using the Import Fires From Another PCHA Database menu option.

Oregon Department of Forestry Fire

The Oregon Department of Forestry (ODF) data files use the naming convention ODF*.FIRES where the * represents any series of legal file naming characters.

Import Fires From Another PCHA Database

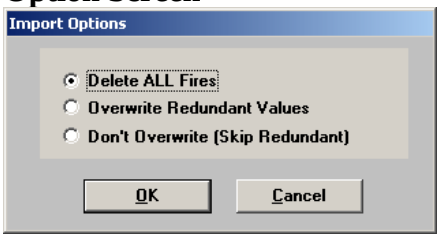
PCHA database files are Microsoft Access® database files (*.mdb) and use the naming convention PCHA99*.mdb where * represents any series of legal file naming characters.

Importing Fire Occurrence Files into PCHA

To import fire occurrence records to PCHA, select **Fire => Import Fires**. Then select the format of the import file. For all file formats except the PCHA Transfer Format, the standard Windows Explorer file selection dialog will appear. The planner needs to navigate to the folder where the import file exists, to select the file and then click **Open**.

Next, a dialog box similar to the one in Figure 59 appears. The planner must choose one of the three options listed on the screen.

Figure 59 – Fires Import Option Screen



Delete ALL Fires

The default option deletes all fire records that currently exist in PCHA. Use this option to delete all existing records from the database and import a new fire record data set.

Overwrite Redundant Values

This option imports new fire records and replaces a fire record in the PCHA database with a new record if one exists in the ASCII fire record file.

Don't Overwrite (Skip Redundant)

This option does not delete duplicate observations so it is possible to have more than one fire record for the same day. Use this option to add new records to the database, but keep all the existing records without changing them.

After an option is selected, click **OK** to start the import process. A progress bar will appear along the bottom of the screen. There is another **Cancel** button in case one wishes to stop the import part way through the process.

Edit Fires

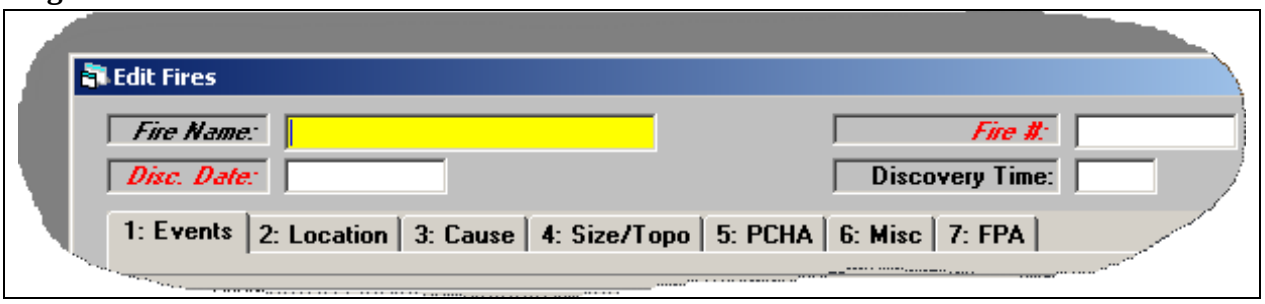
Now that fire occurrence records have been imported for the FPU, the records and data fields need to be examined for completeness and errors.

Figure 60 – The Edit Fires Menu

Figure 61 shows the seven tabs on the screen that appear when the **Fire => Edit Fires** is selected. The tabs contain fields with information contained in the historic fire record, fields with information calculated or assigned by PCHA and fields that are manually assigned by the fire planner.

Each tab except the **Misc** tab displays a group of related data items. The **Misc** tab shows data fields that did not fit well elsewhere. Some agencies have procedures to let the planner send corrections back to the corporate agency fire records database so future data extracts will have the benefit of the corrections made.

Figure 61 – The Edit Fires Menu



Look closely at the fire records to ensure they accurately reflect the planning unit's fire history. Are any large fires missing? If so, find the reports and add them to the planning database. Also contact local agency support personnel for instructions on how to add the missing fire(s) to the corporate database.

Are there any fire records included in the database that should be excluded? Delete those selected from the PCHA database that should not be part of the historical base for planning. Examples of fires to exclude are fire associated with activities that are unlikely to recur. A series of small fires at a rock concert, slash fires associated with timber harvest where timber harvest no longer occurs or rail equipment-caused fires along a now abandoned railroad right of way may fit this criteria.

If interagency partners exist in the FPU, a historic fire that each of the agencies reported needs to be identified. To begin this process, use the **FPA => Report Possible Duplicate Fires** menu to generate a report of fires with similar attributes.

Fire report records contain many fields. It would be of value to the planner to verify the accuracy of all of these data fields. Several data fields are specifically used in the processes to develop fire event scenarios. The planner should be sure these data fields are complete and accurate. A comparison of the electronic data to the hard copy fire report may be needed.

Required information from the fire report for each historic fire to be used for the probability-based fire event scenario process includes:

- Fire Type/Protection Type code for DOI agency fires
- Fire location
- Discovery date

Some information from the fire report for each historic fire is used to develop frequency distributions. Random draws from these distributions are used in the probability-based fire event scenario generation process. Frequency distributions are developed for:

- Discovery time
- Fire control date
- Statistical cause

There needs to be an adequate number of fires with values for these fields so the frequency distributions can be developed.

Additional information from the fire report for each historic fire to be used for the historic-based fire event scenario process includes:

- Aspect
- Slope or slope class
- Elevation or elevation class
- Surface fuel model (used to assist in fuel type assignment)

Top of Fire Screen
The four fields on the top portion of the screen are visible regardless of which tab is selected (Figure 61).

Fire Name
The fire name is an optional but a very useful entry field. This is a searchable field allowing the planner to search the database for a specific fire by name. If fire names are added, do not include the word "Fire" as part of the name.

Fire Number
The fire number can be up to six characters long. The fire number and discovery date give each fire record a unique identity.

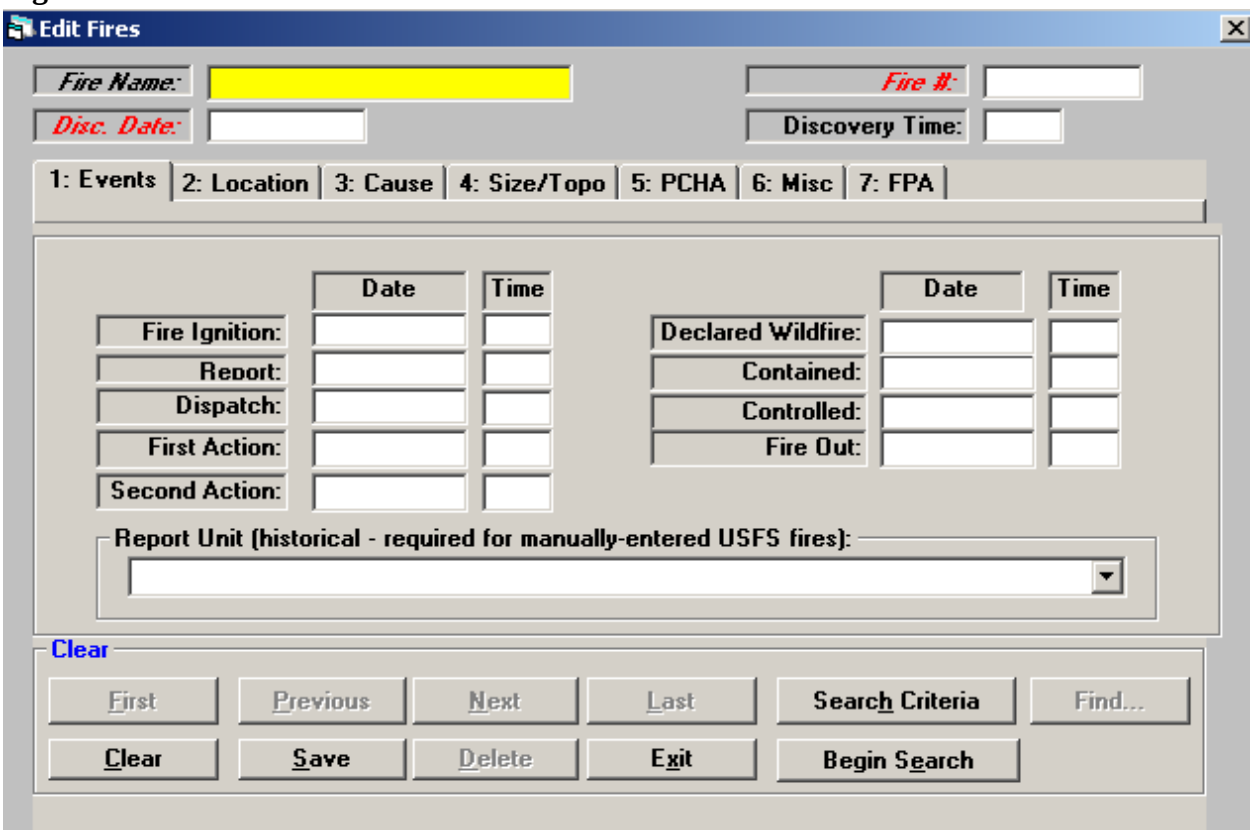
Discovery Date
This field is the date the fire was discovered. If a missing historic fire is added, the planner must define the date of discovery. Enter all dates as mm/dd/yyyy .

Discovery Time
This field is the time the fire was discovered. All times are shown in military time. Note that the Forest Service fire discovery time ranges from 0000 (midnight) to 2359. BLM, BIA, NPS and FWS units have a fire discovery time that ranges from 0001 to 2400 (midnight). PCHA does not accept times outside those ranges.

Events Tab
The screen in Figure 62 will appear when selecting **Fires => Edit Fires => Events** tab. This tab

displays events recorded for the fire. Note that discovery date shows on the top portion of the screen. Not all events are necessarily known for any given fire. Events with no data will be blank. DOI agency fires, generally only include discovery date and time in the imported data. Few (if any) Forest Service fires include Report, Dispatch, Declared Wildfire, or Contained events at this time. Events that are used by PCHA to support development of fire event scenarios should be examined for completeness and accuracy. Consult paper copies of fire records when necessary to verify or obtain event data. It is recommended that data should only be entered into blank data fields if the entered data can be verified to be accurate.

Figure 62



Each event has a date and associated time. Enter dates in month, day, year format (i.e., 6/15/1995) and time in hours and minutes in military time format (i.e., 1425).

Fire Ignition

This event is the best estimate of the date and time the fire ignited. If the date and time are not known for certain (which is often the case), this should be the best estimate of the date and time.

Report

The report field records the date and time when the reporting suppression agency learned about the fire.

Dispatch
This field is the date and time when the first fire preparedness unit was dispatched to the fire.

First Action
This field is the date and time that initial suppression action began at the site of the fire. This time must be at least one minute after discovery.

The first action for a prescribed natural fire might be an aerial reconnaissance flight, or a determination by management on the type and kind of fire suppression or management activities.

Second Action
This field is the date and time that reinforcements arrived at the fire site. This field records when the first reinforcements arrived. These units must arrive at least 5 minutes after the initial resource(s) arrived.

Declared Wildfire
This field is the date and time when a fire manager declared that a prescribed fire would be suppressed as a wildfire. This is applicable regardless of whether the ignition was from natural sources such as lightning or from a resource management decision to ignite the fire. Agency policy dictates the circumstances for the change in status. There are various management reasons this declaration or change in status may occur. Leave this field blank if the fire was not a prescribed fire at some point in its life.

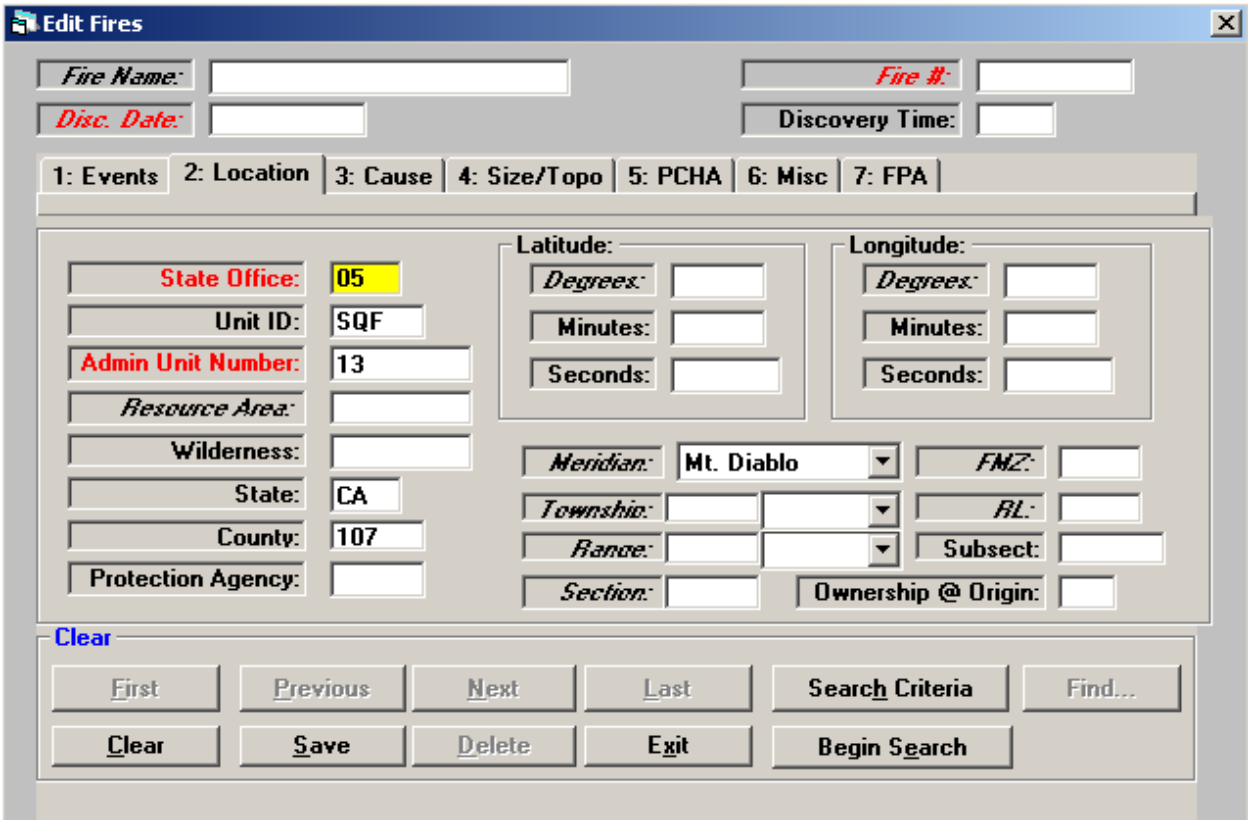
Contained
This field is the date and time when the fire was declared contained.

Controlled
This is the date and time when the fire was declared controlled. Other terms used include Suppression Strategy Attained or Suppression Strategy Met. This would also be the date and time when the strategy was met for a prescribed natural fire.

Fire Out
This is the date and time when the fire was declared out. At least one minute must elapse between the control date and time and fire out time.

Location Tab
The screen in Figure 63 will appear when selecting **Fires => Edit Fires => <u>Locations</u>** tab. This tab displays the data recorded for the administrative and geographical locations of the fire.

Figure 63 –



<u>Region/State Office</u>
This field is the two-digit Forest Service Region number or is the two-letter State Office code for DOI agencies. Other agencies should leave this field blank.

<u>Unit ID</u>
This field is the three-letter fire unit designator. These identifiers must be unique within a state.

<u>Unit Number</u>
This field is one of the following: two-digit Forest Service National Forest number, the BLM District identifier, the BIA Agency identifier, the NPS park identifier or the FWS refuge identifier.

<u>Ranger District/Resource Area</u>
This field is the two-digit Ranger District number within a National Forest or the Resource Area within a BLM District or BIA Agency. It will be blank for the NPS and FWS.

Wilderness
A three-digit wilderness code uniquely defines the wilderness area designated and set aside by Congress in which the fire began. By definition, only fires that occurred within wilderness boundaries after the congressional declaration are considered wilderness fires. If the fire did not occur in a designated wilderness, leave this field blank or zero.

State
The two-letter postal abbreviation identifies the state in which the fire started.

County
This three-digit county code identifies the county in which the fire started. The codes are defined by a Federal Information Processing System (FIPS) publication.

Protection Agency
This field identifies the agency legally responsible to provide primary protection for the land on which the fire started. For federal agencies, use the three-letter codes below. For state, local, private, or other protection agencies, use the standard two-letter state codes.

Table 14 – Protection Agency Codes

Codes	Federal Agency
USF	USDA Forest Service
BLM	USDI Bureau of Land Management
BIA	USDI Bureau of Indian Affairs
FWS	USDI Fish and Wildlife Service
NPS	USDI National Park Service
ARM	Department of Defense - Army
AFS	Department of Defense – Air Force
NAV	Department of Defense – Navy
OTH	Other Federal Agency

Latitude and Longitude
The latitude and longitude values locate the fire's point of origin. Report degrees, minutes, and seconds in whole numbers.

Legal Location (Meridian, Township, Range, Section, Subsection)
For fires in the 30 public land survey system states, enter township, range, section, subsection, and principal meridian to locate the fire's origin. The legal description should correspond very closely to the geographical coordinates (latitude and longitude). Fires in areas not covered by the public land survey system should leave all these fields blank.

Meridian
The meridian field has a list of all the principal meridians defined in the US. Use the pull-down to select the principal meridian.

Township
Enter the township number and direction (N or S from the baseline). If a township is entered without a direction (N or S), an error message will not appear. If the township is a special township (such as a quarter, half, or three-quarter township), change the value in the box to the right of township to show that fact.

Range
Enter the range number and direction (E or W from the principal meridian). If a range is entered without a direction (W or E), an error message will not appear. If the range is a special range (such as a quarter, half, or three-quarter range), change the value in the box to the right of range to show that fact.

Section
Enter a section number from 1 to 36.

Subsection
The subsection can be shown to the nearest quarter section (160 acres) or quarter quarter section (40 acres). By convention, enter the smallest subdivision first. As an example, SWSE means the southwest quarter of the southeast quarter section.

FMZ
If a Fire Management Zone has been entered on the fire report, it will be displayed here. This field is not used in FPA.

Representative Location (RL)
This field is not used in FPA. Leave it blank.

Ownership at Origin
Only Forest Service units use this field. It shows the one-digit code that corresponds to land ownership at the point of origin (Table 15).

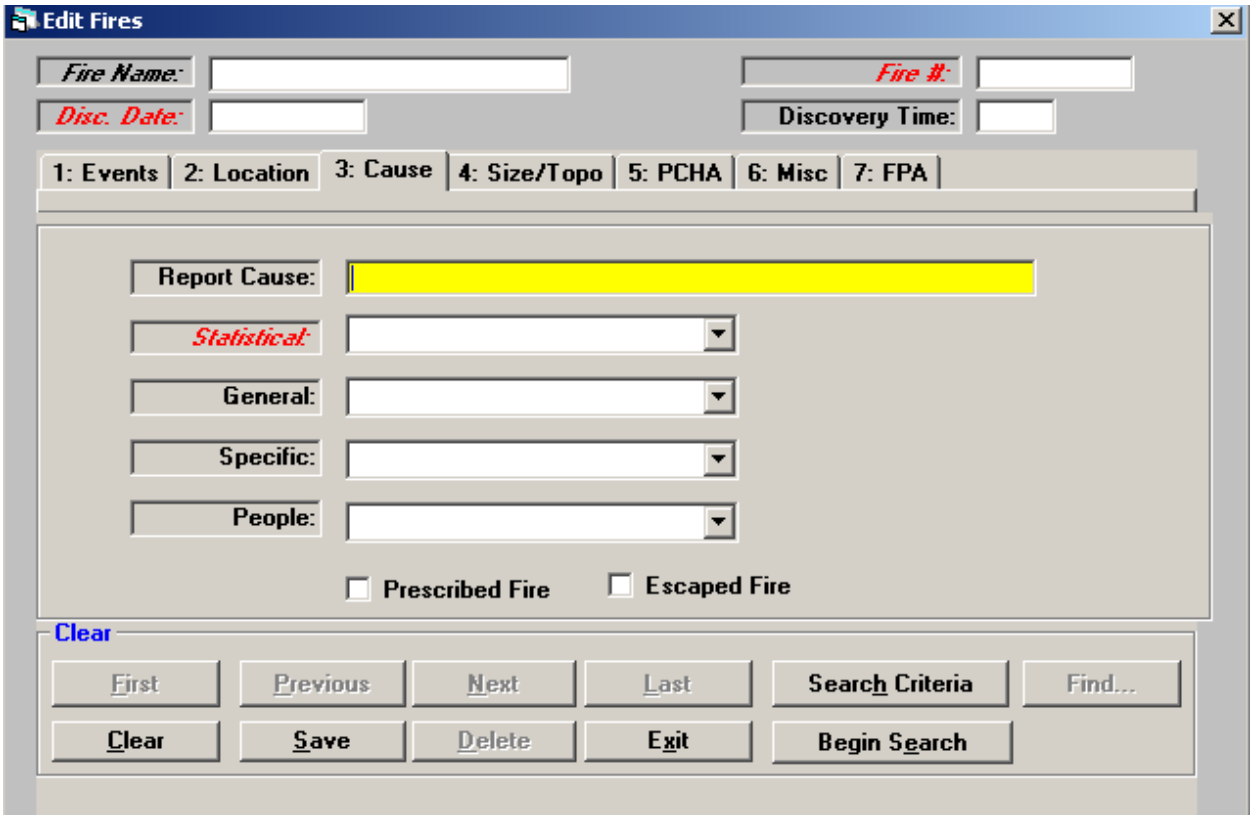
Table 15 – Ownership at Origin Codes

Code	Definition
1	National Forest, National Grassland, or Land Utilization Project.
2	State and private lands inside Forest Service protection boundary.
3	Lands outside Forest Service protection boundary.
4	Other Federal lands inside Forest Service protection boundary.

Cause Tab

The screen in Figure 64 will appear when selecting **Fires => Edit Fires =>** **Cause** tab. This tab displays the fire cause codes for each fire. In addition, check boxes show whether the fire was an escaped fire and/or a prescribed fire (blanks mean no). For most fire planning purposes, statistical cause is very important, and the other cause codes further define the actual cause. Prevention planning relies heavily upon accurate fire causes.

Figure 64



Report Cause

This is an optional use field that allows for entry of a brief description of the fire's cause. This is a particularly useful field if the other fire causes do not adequately describe the actual fire cause. Many fires do not fit easily into the current fire cause coding system and this field allows for a better description of what really caused the fire.

Statistical (Cause)

This field identifies the broad statistical cause for the fire. Note that the code numbers are different between Forest Service and DOI-1202 codes, but the definitions are the same. PCHA translates from the external agency codes to the internal codes. PCHA internally uses the Forest Service statistical cause codes (Table 16).

Table 16 – Statistical Cause Codes

Code	Dept. of Interior	Forest Service
0	Not specified	N/A
1	Natural	Lightning
2	Campfire	Equipment use
3	Smoking	Smoking
4	Debris burning	Campfire
5	Incendiary	Debris burning
6	Equipment use	Railroad
7	Railroad	Arson
8	Children	Children
9	Miscellaneous	Miscellaneous

General (Cause)

General cause supplements statistical cause to better identify the human activity associated with the fire ignition. The list box shows the available categories. Code unknown activities and lightning fires into the Other category.

Specific (Cause)

Specific cause attempts to narrow down the exact fire cause. Group unknown causes into the Other category.

People (Class)

This field identifies the group or class of people associated with the fire ignition. Code lightning fires as Other. Code persons whose status cannot be determined as Other.

Prescribed Fire (Check Box)

If someone with authority decided to manage an unplanned ignition as a prescribed fire, then check the box. If the ignition was suppressed as a wildfire, leave the box unchecked.

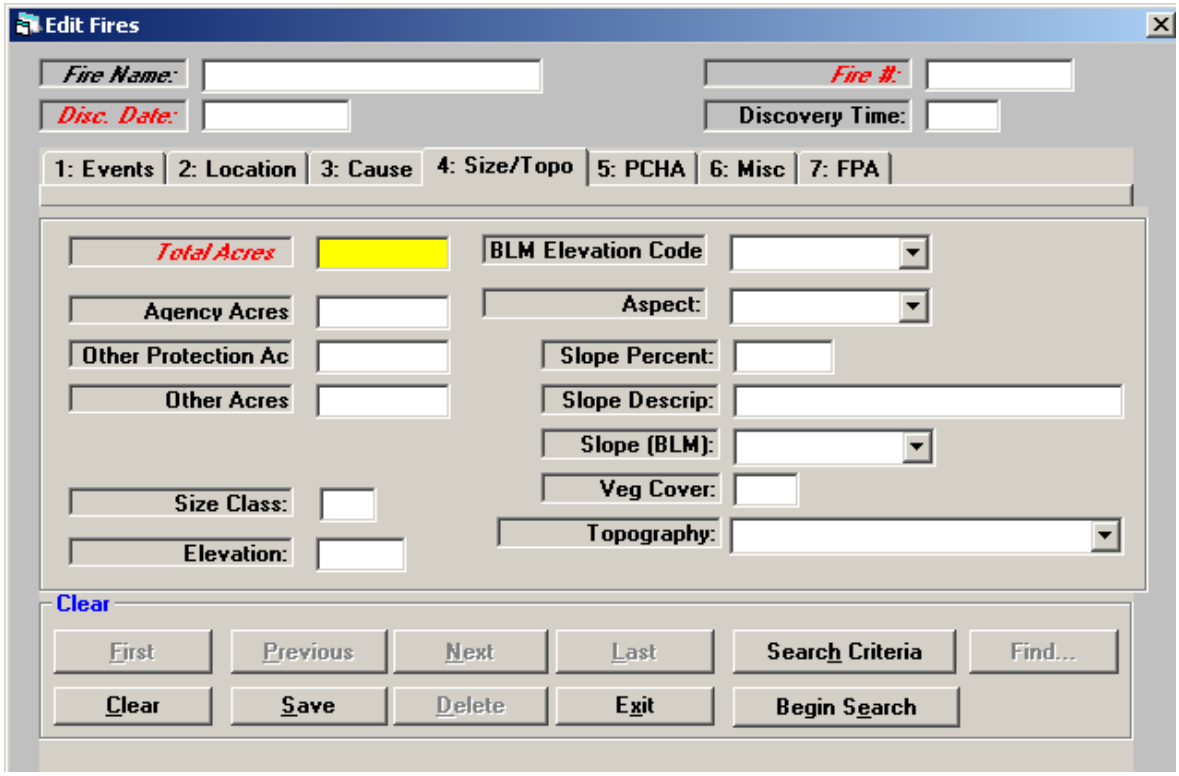
Escaped Fire (Check Box)

If the planned first action and first reinforcement forces achieved the suppression strategy for the fire, then leave the box unchecked. If the fire escaped fire suppression efforts of the planned response, check the box.

Size/Topo Tab

The screen in Figure 64 will appear when selecting **Fires => Edit Fires => <u>Size/Topo</u>** tab. This tab displays the size and topographic attributes for each fire. Total acres must be entered for each fire.

Figure 64



<u>Total Acres Burned</u>

This field shows the total acres burned regardless of ownership. Code fires that burn less than an acre to the nearest 0.1 acres. Code fires that are larger than 1 acre in whole acres. If the data includes only size class, most size class "A" fires are less than 0.1 acre, enter 0.1 as the total acres for those fires. This is a required field for every fire.

<u>Agency Acres</u>

This is the number of acres that burned on the reporting agency's land.

<u>Other Protection Acres</u>

Enter the acres of non-agency lands protected by the agency within the fire perimeter.

<u>Other Acres</u>

Enter the acres outside the agency's protection boundary within the fire perimeter.

Size Class

This one-letter code categorizes fires into size classes. Size class is based on the total acres burned, not just the area burned within the planning unit. Fires before 1970 only used codes A-E with E defined as 300 acres and larger. If fires that occurred before 1970 are entered, use the more recent codes. The definition of each size class is contained in Table 17.

Table 17 – Size Class Definitions

Code	Definition (Acres)
A	0.0 – 0.24
B	0.25 – 9.9
C	10.0 – 99.9
D	100 – 299
E	300 – 999
F	1000 – 4999
G	5000+

Elevation

This is the elevation of the fire. It is entered to the nearest hundred feel.

BLM Elevation Code

This field is the elevation class at the fire head during the initial attack.

Aspect

This field is the general aspect (direction the land faces) on which the fire was burning at the time of initial attack.

Slope Percent

This field is the percent slope at the fire origin.

Slope Description

This is an optional entry field to briefly describe the slope and topographic position of the fire (i.e., lower, middle, upper, ridgetop and so forth).

Slope (BLM)

This field is the slope code at the fire origin used on BLM and BIA fires.

Vegetation Cover

This two-digit code identifies the general cover type in which the fire burned during the initial attack. Each Forest Service Region has defined the important cover types within the region and assigned a two-digit numerical code to each.

One complication to the coding scheme is that most Forest Service Regions change the definition of their codes about every decade. That means that a particular code on a 1970 fire may not mean the same as the same code in 1995. Generally the Regional codes identify both cover type and the conditions within a vegetation type that are significant to fire protection activities. Examples include cutover, seedling and saplings, bug-killed pole stands, thinning slash, and so forth.

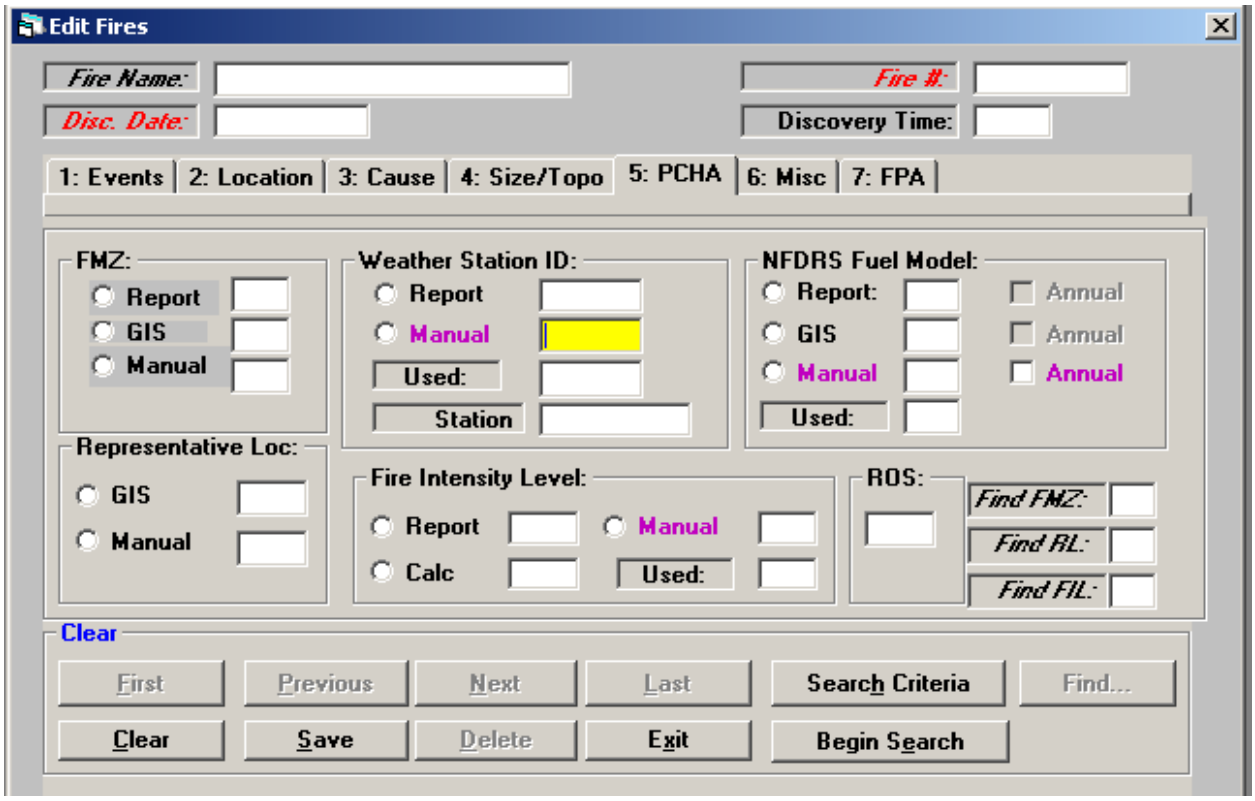
If the planner intends to rely heavily upon this data, the planner should obtain a copy of the applicable vegetation cover class codes for the period in the analysis so the codes can be interpreted correctly.

Topography
This field defines the general topography within the fire's burned area.

PCHA Tab
The PCHA screen displays the current values of selected fire information contained in the fire report, generated from GIS maps, calculated by PCHA, or entered manually. Only manual fields on this screen may have values entered.

All of the fields on this screen except rate of spread (ROS) contain values that come from agency fire reports (Report cell). If a fire report record was imported to PCHA from another PCHA database used to do fire planning using the legacy system, then there might be an entry for a field in the GIS or Manual cells.

Figure 66



FMZ
This field displays the current Fire Management Zone (FMZ) information on the fire contained in the fire report, calculated from GIS maps, or entered manually. The FMZ provided by the fire report will be from a legacy planning system and has no application in FPA.

Representative Location
This field displays the representative locations assigned to fires calculated from GIS maps or entered manually. This field is not used in FPA.

Weather Station
This field displays the station number and observation date that could be used for the fire based on data from the fire report, assigned by the program, or entered manually. The Station Date field displays the date of weather assigned to the fire. Weather date could be different from the actual fire date due to missing weather data or other factors driven by the assignment priorities.

NFDRS Fuel Model
This field shows the National Fire Danger Rating System (NFDRS) fuel models assigned to the fire based on data from the fire report, generated from GIS maps, or entered manually. Check the Annual box if the herbaceous vegetation is annual. Leave it unchecked if perennial.

Fire Intensity Level
This field displays the fire intensity levels assigned to the fire based on the fire report, calculated by the program or entered manually.

Rate of Spread (ROS)
This field shows the calculated rate of spread in chains (66 feet) per hour.

Table 18 – NFDRS Fuel Models

Fuel Group	NFDRS Fuel Model
Grass	A – Western Annual Grasses
	C – Open Pine with Grass
	L – Western Perennial Grasses
	N – Sawgrass
	S – Tundra
	T – Sage with Grass
Brush	B – Mature Brush (6 feet)
	D – Southern Rough
	F – Intermediate Brush
	O – High Pocosin
	Q – Alaska Black Spruce
Timber Litter	E – Hardwood Litter (Fall)
	G – Heavy Short Needle Timber Litter
	H – Normal Short Needle Timber Litter
	P – Southern Lone Needle Pine Litter
	R – Hardwood Litter – Spring/Summer
	U – Western Long Needle Litter
Slash	I – Heavy Slash
	J – Medium Slash
	K – Light Slash

Misc Tab
This tab (Figure 67) shows fire data that did not easily fit anywhere else, but that some planners wish to keep and use.

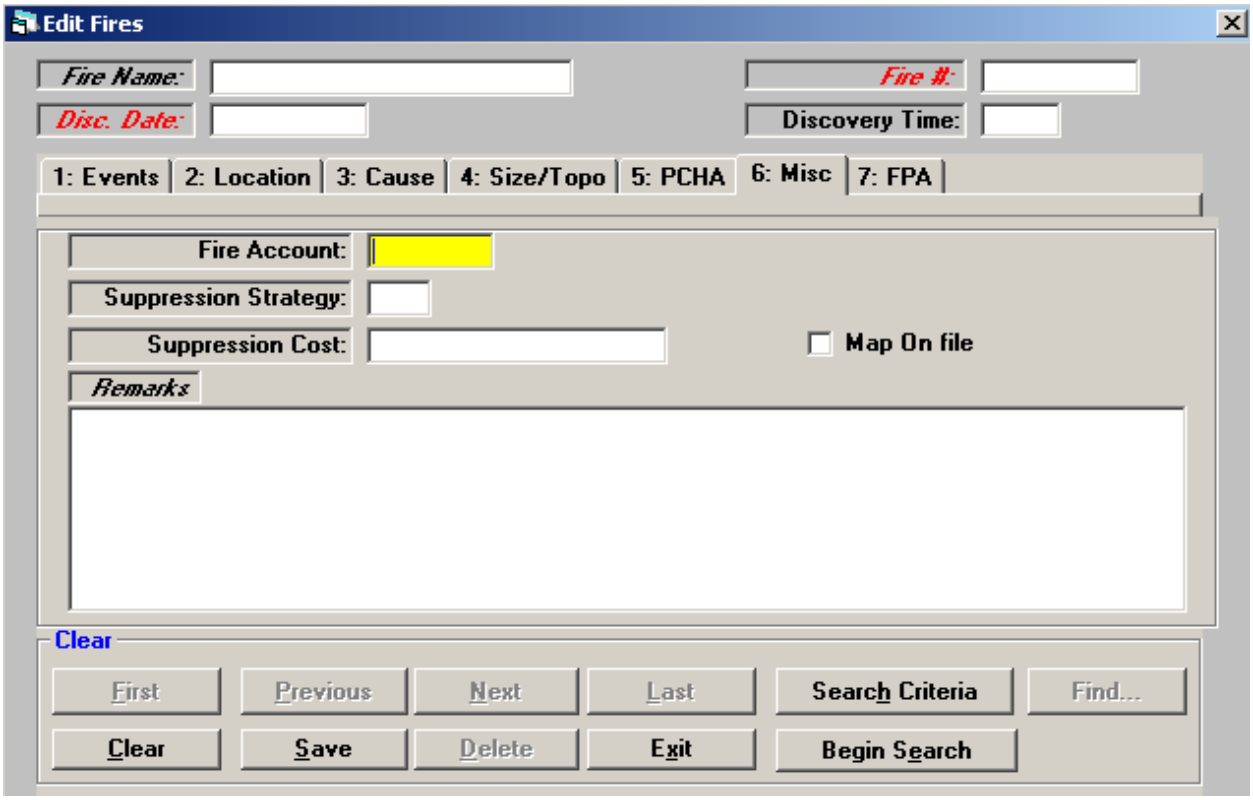
Fire Account
This field shows the fire cost account code. If this value is entered, enter the five-digit "P" code value assigned to the fire without the leading “P” or “R.” A “P” code is now required for all Forest Service D class (100 acres) and larger fires, but is recommended for all fires if the data is available.

Suppression Strategy
This field is a Forest Service code that identifies the predominant strategy for the kind, amount, and timing of the initial dispatch and initial suppression action.

Table 19 – Suppression Strategy Codes

Code	Strategy
1	Confine
2	Contain
3	Control

Figure 67



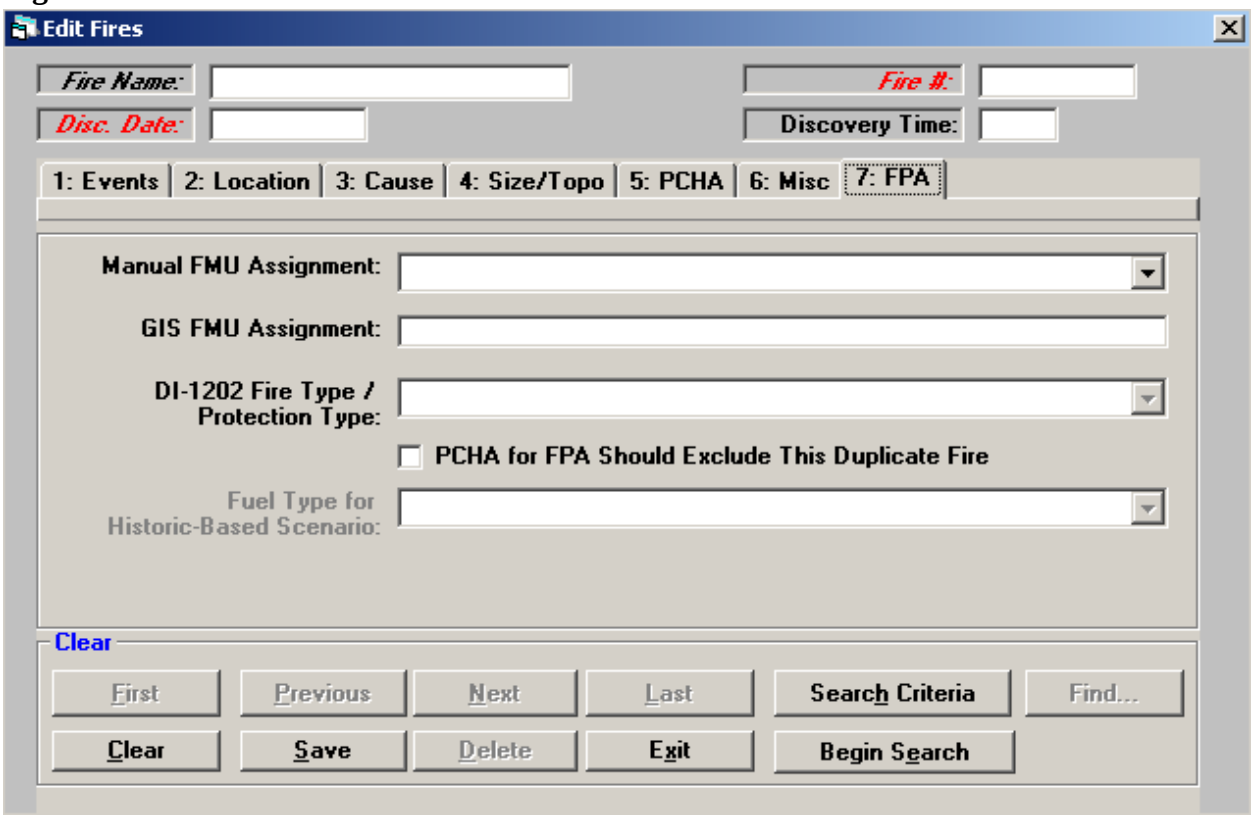
Suppression Cost
This field stores the estimated total emergency fire fighting funds expended by the protection agency as a result of this fire.

Map on File
Check this box if a map is attached to the report or if a map is on file. This can serve as a reminder that more detailed location and perimeter information is available locally.

Remarks
Enter remarks that you may have.

FPA Tab
This tab contains cells specific to FPA.

Figure 68



Manual FMU Assignment
This entry allows for the planner to manually assign an FMU for a historic fire. This may be needed if one is not assigned via the **FPA => Assign FMUs to Fires Using GIS** menu. If a fire is assigned incorrectly to an FMU, it is because the latitude/longitude assigned to the fire is not within the FMU. Instead of changing the FMU assignment here, edit the incorrect latitude and/or longitude assignment and then select **FPA => Assign FMUs to Fires Using GIS**.

GIS FMU Assignment
This is the FMU assigned to the fire via the **FPA => Assign FMUs to Fires Using GIS** menu.

DI-1202 Fire Type / Protection Type
Two fields, fire type and protection type, identify the types of incidents. Table 20 provides definitions for each.

Table 20 – DOI Fire Type and Protection Type Definitions

Fire Types		Protection Types	
Code	**Description**	**Code**	**Description**
1	Suppressed Fire	1	For agency land under agency protection. The agency has the fire suppression responsibility.
2	Natural Out	2	For agency lands protected by another Federal agency under an interagency mutual aid agreement. Another agency does the suppression work.
3	Support Action	3	For agency lands protected by a non-Federal agency (e.g. state, county, city) under a cooperative agreement, memo of understanding, or contract.
4	Prescribed Fire	4	For fires suppressed under confine or contain strategy under Fire Type 1.
5	False Alarm	5	For other lands not under agreement, memo of understanding or contract, but where agency suppression action was taken to prevent fire spread onto agency lands; i.e. private land adjacent to agency boundary.
		6	For other lands protected by agency under a memo of understanding, interagency agreement or contract.
		7	Support actions by agency resources under Fire Type 3.
		8	Prescribed burns – management-ignited prescribed fires, ignited by or for park management under Fire Type 4.
		9	Prescribed natural fires - ignited by lightning, volcanic activity, or other natural ignition sources under Fire Type 4.

PCHA for FPA Should Exclude This Duplicate Fire

Within an FPU, there can be multiple agency partners that historically have responded to the same fires. Each agency might have completed an agency fire report for one or more of these fires. When all of these agencies' fires are imported to PCHA, duplicate fire reports can exist for the same historic fire. This check box allows for the designation of a fire as a duplicate fire.

The identification of potential duplicate fires is possible using the **FPA => Report Possible Duplicate Fires** menu. This menu item produces a report of fires with similar fire report values.

Fuel Type for Historic-based Scenario

A fuel type in FPA is a unique combination of the following:

- Canopy cover
- Surface (FBPS) fuel model
- Canopy base height
- Canopy bulk density
- Stand height

Canopy cover

Canopy cover is normally measured as a percent. It is based on the lineal length that is within a canopy versus in the open.

Surface (FBPS) fuel model

These are the 13 FBPS fuel models (Anderson 1982).

Table 21 FBPS Fuel Models

Fuel Group	FBPS Fuel Model
Grass	1 - Short Grass (1 foot)
	2 - Timber (Grass and understory)
	3 - Tall Grass (2.5 feet)
Brush	4 – Chaparral
	5 – Brush
	6 - Dormant Brush
	7 - Southern Rough
Timber Litter	8 - Closed Timber Litter
	9 - Hardwood (pine long needle litter)
	10 - Timber
Slash	11 - Light Slash
	12 - Medium Slash
	13 - Heavy Slash

Canopy base height

For an individual tree, the measurement of the height to the base of the crown can be made. The averaging of these values for all trees in a stand would give an estimate of the height of the canopy base height. Frequently, this is a measure of where the limbs of the canopy start vertically. This number can be skewed by the presence of small trees or occasional live limbs. A more meaningful value would be the height above the ground of the first canopy layer where the density of the crown mass within the layer is high enough to support vertical movement of a fire.

Canopy bulk density

Mathematically, canopy bulk density (CBD) (lbs/ft^3) is canopy biomass divided by the volume occupied by canopy fuels. Canopy bulk density is hard to estimate in the field. Initially, it seems attractive to calculate this value by treating the canopy as a box with the depth of the stand height minus the canopy base height. Assuming this box covered an acre (43,560 ft^2), dividing the fuel loading in the canopy by the volume of box would provide an estimate of average canopy bulk density. Unfortunately, this estimate has a bias toward under estimation of the canopy bulk density due to the averaging of largely void areas in the top and bottom of the canopy with the more dense layers of foliage. A fire burning vertically within the crowns will most likely propagate through denser canopy layers.

Stand height

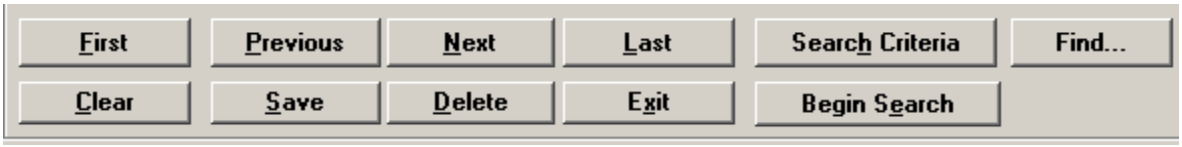
For an individual tree, height is the measurement to the top of the tree tip. Averaging the heights for all trees in a stand would give an estimate of the stand height.

This pull-down allows for the designation of a fuel type that existed at the point of origin of a historic fire. If a surface fuel model (FBPS or NFDRS) is designated on the fire report, that information should be used to determine an appropriate fuel type.

Bottom of Edit Fires Screen

All of these buttons are usable from any of the tabs or to enter a new record or a search.

Figure 68



Save Button

The **Save** button saves the information for the active date to the PCHA database. Until this button is clicked, any changes made in fields are not permanently saved to the PCHA database.

Clear Button

The **Clear** button resets all data fields to blank.

Delete Button

This button deletes the current record from the database. If there are no fire report records in the database or displayed on the screen, this button will be light gray and inoperative.

Begin Search Button

Click **Begin Search** to find the first fire report record in the database or the first record that meets the defined search criteria.

Search Criteria Button

Click **Search Criteria** to clear the screen and define the fields that will control which fire report records you want to find in the database. Fields with their names written in italic text are available for searches. After the criteria are entered, click **Begin Search**.

For example, the planner can search for all fires with a statistical cause of campfire. To do so, click **Search Criteria** , go to the **Cause** tab and select Campfire from the Statistical (Cause) pull-down. Then click **Begin Search**.

Figure 70

First, Previous, Next, and Last Buttons

The **First** button displays the first fire report record in the database or the search list. The **Previous** and **Next** buttons display the fire reports before or after the current one. The **Last** button displays the last fire report in the database or search list. These buttons show light gray if there are no fire report records in the database or displayed on the screen.

Find Button

Unlike the **Search Criteria** and **Begin Search** buttons, which retrieve a set of records to view, the **Find** button is used to jump to desired records within those already retrieved with **Begin Search**. Click **Find** and then select **Clear** from the pop-up menu. This will clear all fields. Enter the values to determine which record is desired, and then click **Find** and select **Find** from the pop-up menu. To move from a record to another similar record after a **Find** command, click **Find** and then select **Next** or **Previous** from the pop-up menu.

Exit Button

The **Exit** button closes the fire report edit screen and returns to the main PCHA screen.

Calculate Latitude and Longitude from Legal Locations

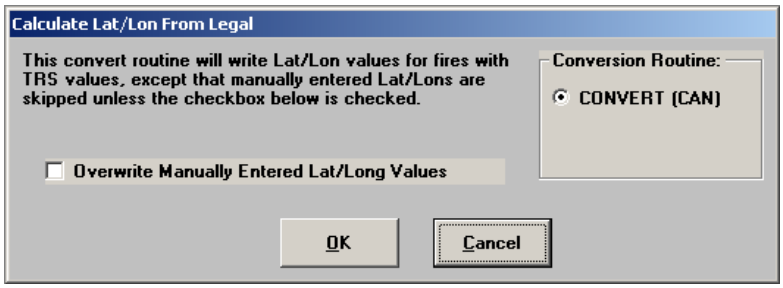
Figure 71 – The Edit Fires Menu

For some planning activities, latitude and longitude coordinate values are very useful. Latitude and longitude are required so GIS tools can assign each historic fire to a FMU. Some fire records only have legal description locations (township, range, and section). To get latitude and longitude on each fire, the planner can edit each fire record. A utility can also be run that will calculate latitude and longitude values from legal locations. This process only works for public land survey states, and only if the conversion factors exist for the area the FPU is in.

This menu item calculates latitude and longitude values at the center of the section. Since in most cases, PCHA only knows the township, range, and section number, the section center is the point of least error. The convert routine generates some errors when assigning latitude and longitude values from legal descriptions (township, range, and section), particularly in areas with half townships. Therefore, it is wise for the planner to use topographic maps, unit maps, or other sources to manually assign latitude and longitude values in some situations.

Selecting the **Fire => Calculate Lat/Lon for Legal** menu yields the dialog shown in Figure 72.

Figure 72



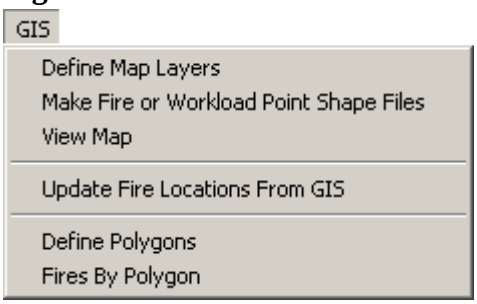
Overwrite Manually Entered Lat/Long Values
Check this box to replace the existing latitude and longitude values already entered into the database with the new latitude and longitude values generated by the convert routine. If the existing latitude and longitude values are accurate, then do not select this option.

The GIS Menu

This GIS (Geographic Information Systems) chapter describes PCHA's capabilities to display and manipulate spatial data.

The planner is able to list the GIS layers to be viewed, to prepare certain GIS layers, to view the map, to define polygons and to view reports of fires within these polygons.

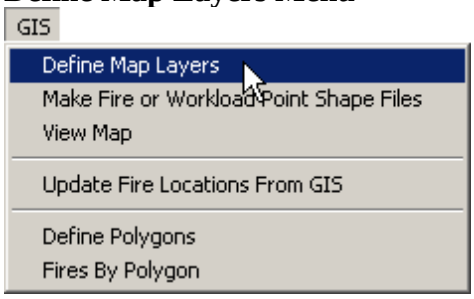
Figure 73 – The GIS Menu



Define Make Layers

Use this screen to define the path to the GIS layers. Selecting this menu results in the display of the window shown in Figure 75.

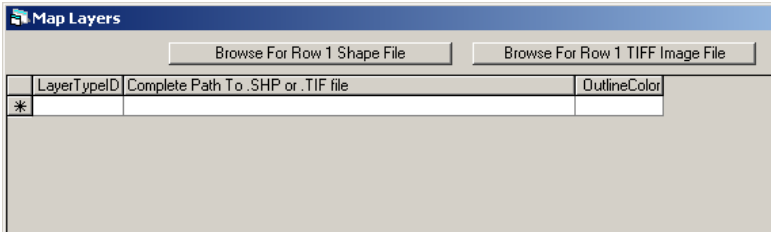
Figure 74 – The GIS Menu, Define Map Layers Menu



Layer Type ID Column

Clicking in the box below the column name will allow for display of a pull-down arrow. Use this pull-down to select either IMAGE or SHAPE. This defines the format of the GIS file that will be used in PCHA.

Figure 75



An Image file must be in Tag Image File Format (TIFF). These image files have an extension of .TIF. The image file must be geo-referenced to appear in the correct area of the map display. A TIFF file, which has been geo-referenced, will have two files. One will have the extension .TIF and the second will have the extension .TFW.

A Shape file is a GIS layer in the ArcView shape file format. It consists of three files with extensions .SHP, .SHX and .DBF. All three files must exist in the same folder.

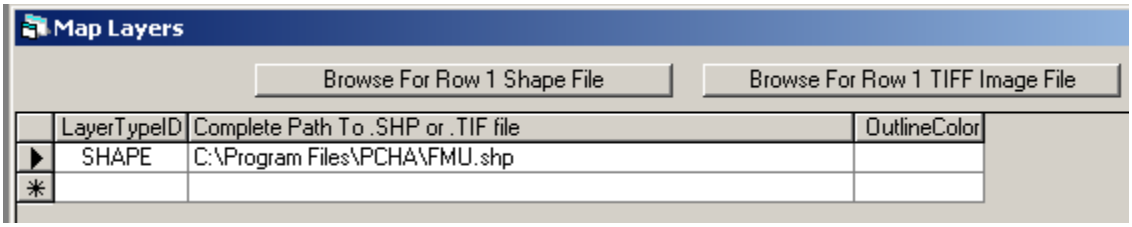
Complete Path to .SHP or TIF file Column
The planner has two options to complete this cell entry. One is to manually type the complete path to the .SHP or .TIF file depending on which file type appears in the LayerTypeID column. The second is to use the appropriate Browse button to use the Windows File Manager dialog to select the .SHP to .TIF file. PCHA will expect the associated files (.TFW or .SHX, .DBF) to have the same filenames and to be in the same folder.

After selecting a layer using the Browse option, the planner MUST click on a different row or move to a different row using the arrow keys for the cell entries to be recorded in the PCHA database.

When using the Browse option, the entry in the Layer Type column will appear automatically.

After an FMU shape file is selected, the dialog in Figure 66 may look similar to the one in Figure 75.

Figure 75 –



Outline Color Column
If the layer is a SHAPE file, the planner may select a color for the layer when the data is displayed on the map. If the color is omitted, it will be shown in black. Use the pulldown list to select one of the listed colors. The available colors are in Table 20

Table 20 Available Data Colors

Black	Magenta
Red	Cyan
Green	White
Blue	

To save all information and close the window, click on the small "x" in the upper right corner of the window.

Make Fire or Workload Point Shape Files

PCHA has the ability to create shape files showing the fire locations in the PCHA database. It can also create shape files with the calculated and manually entered workload points by FMU.

Selecting GIS => Make Fire or Workload Point Shape Files will result in the dialog box shown in Figure 78.

Figure 77 – The Make Fire or Workload Point Shape File

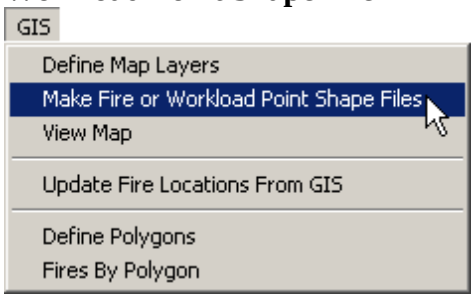
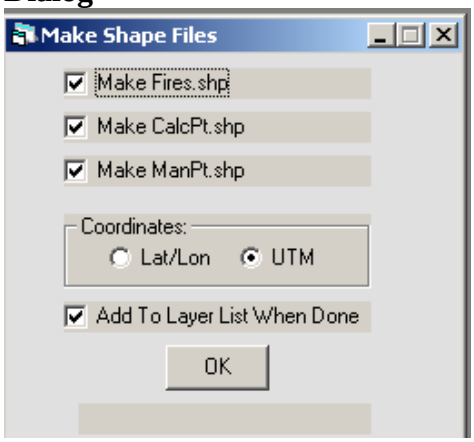


Figure 78 – Make Shape File Dialog



Make Fires.shp File Option

PCHA has the ability to create shape files showing the fire locations in the PCHA database. To create this shape file, click in the check box to the left of the Make Fires.shp option.

Make CalcPt.shp File Option

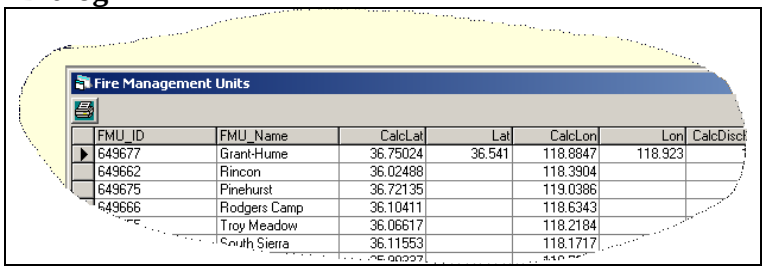
Before this shape file can be created, the planner needs to have selected the **FPA => Calculate/Edit FMU Workload Point** menu item. To create this shape file, click in the check box to the left of the Make CalcPt.shp option.

Make ManPt.shp File Option

Before this shape file can be created, the planner needs to have selected the **FPA => Calculate/Edit FMU Workload Point** menu item and then entered manually an override location for the workload point for an FMU (Figure 79). The location of the workload is entered using latitude and longitude in degree and decimal format.

To create this shape file, click in the check box to the left of the Make ManPt.shp option.

Figure 79 – Calculate/Edit FMU Workload Point Dialog



Coordinates

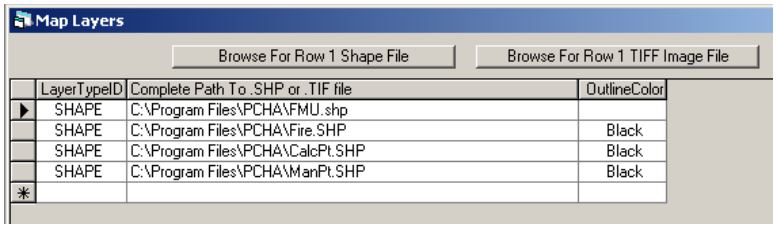
Select either "Lat/Lon" or "UTM" for the desired map coordinates. If UTM is selected, the UTM Zone entered on the File-Planning Unit Setup screen will be used.

Add To Layer List When Done

Clicking this box will result in PCHA automatically adding this layer to the list of Map Layers in the dialog box shown in Figure 76.

Click OK to begin. PCHA may work for several minutes preparing the shape file(s). An example of the Display Map Layers dialog (once all four shape files have been created) is shown in Figure 80.

Figure 80



View Map

To view the map with the layers that are listed in the Map layers dialog (Figure 80), select **GIS => View Map**. A map with the data layers will appear. It may appear similar to the one in Figure 82. In the upper left of the screen, there are six icons that function as described in Table 23.

Figure 81 – The View Map From GIS Menu

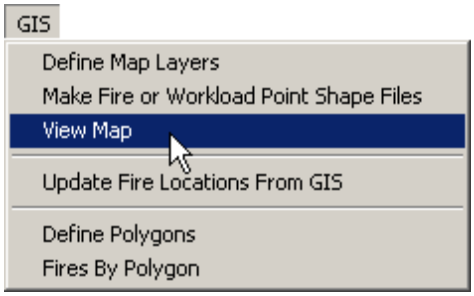


Figure 82

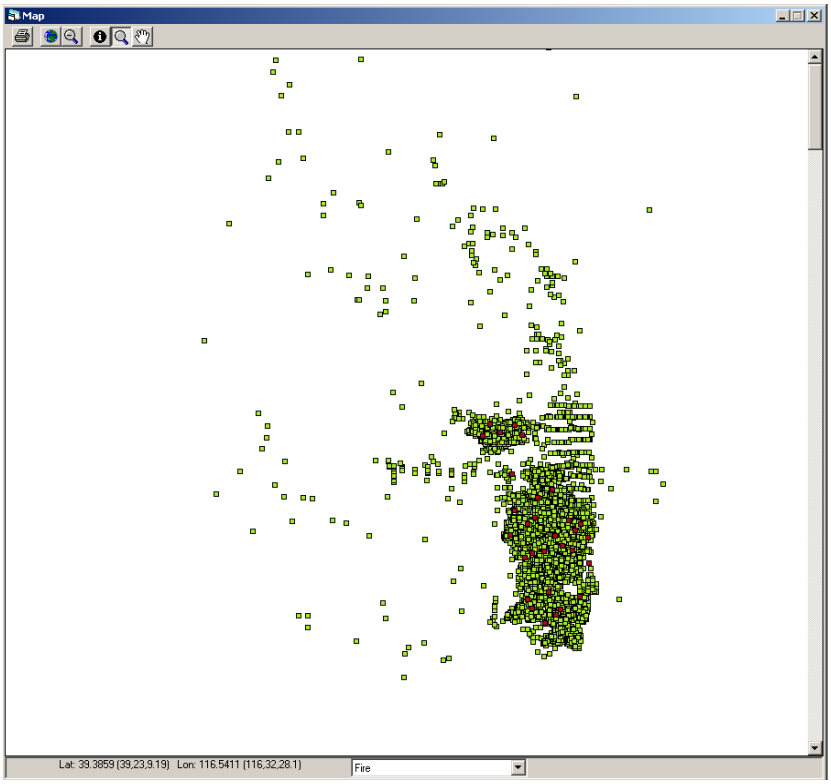


Table 23 Description of function of icons

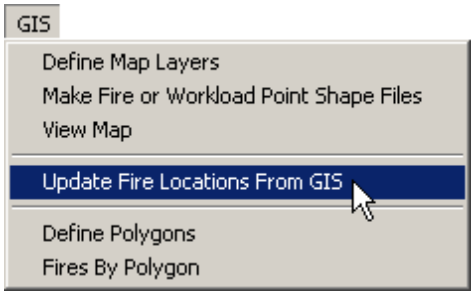
Icon	Function
	Print the map
	Return to Full Extent
	Zoom Out – The map will show twice as much area
	Identify the feature clicked on. First, select a map layer using the pull-down list at the bottom of the window. Second, click on the **Identify** icon. Third, click on a map feature and an Attributes box will appear listing the attributes of the map feature selected.
	Create a zoom area. After clicking, then place cursor at upper left corner of desired area. Hold left mouse button down and drag to create a rectangle around the area to be zoomed to. Release the left mouse button and PCHA will redisplay the map showing the area defined in the rectangle.
	Pan – Hold left mouse button down and move mouse to pan the map in any direction. Release the left mouse button to complete the panning operation.

Update Fire Locations from GIS

This menu item supports the updating of the latitude and longitude assigned to fire records using a GIS shape file. The fires in the GIS shape file must have the fires identified by one of the methods:

- Discovery date and fire number
- NIFMID identifiers
- PCHA record number

Figure 83 -The Update Fire Locations From GIS Menu



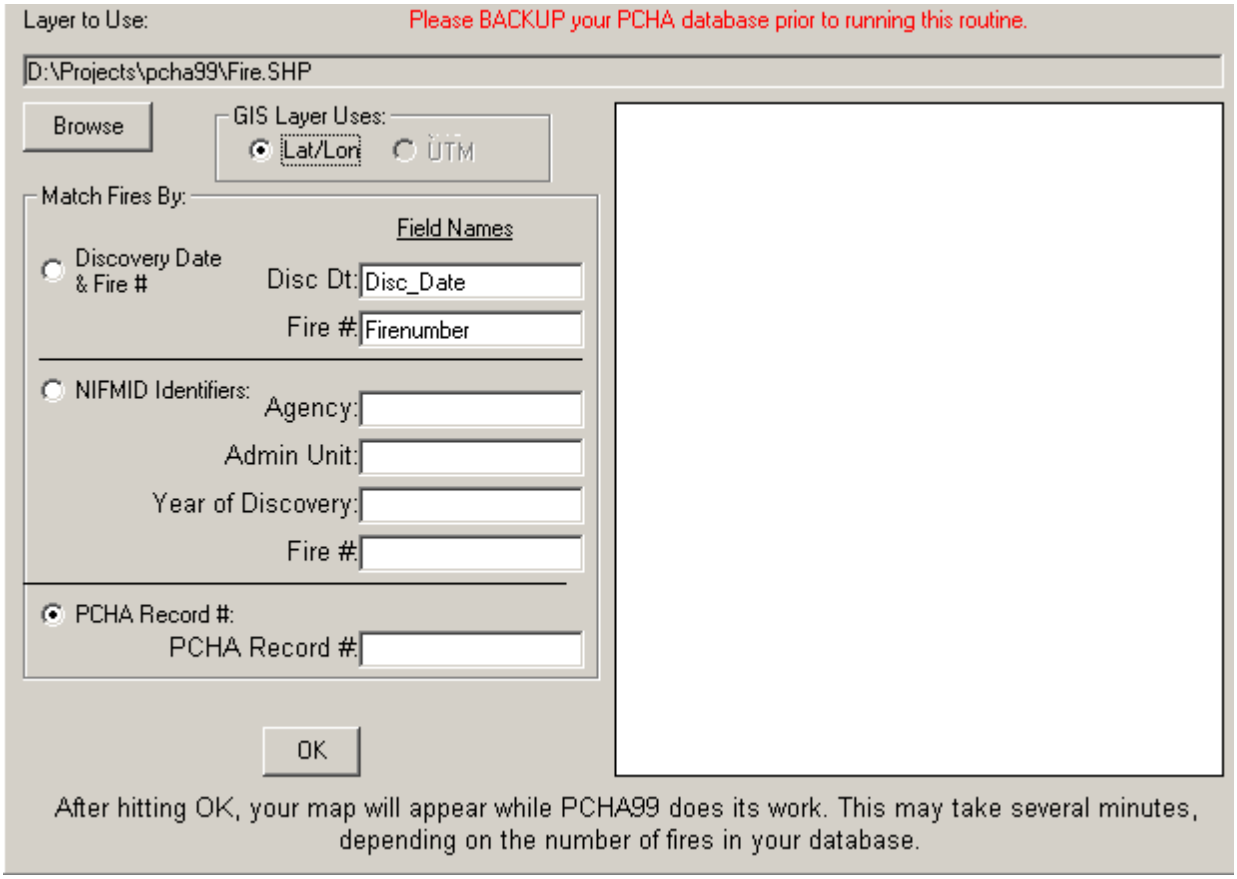
NIFMID stands for the National Interagency Fire Management Integrated Database and applies only to Forest Service units.

Selecting **GIS => Update Fire Locations From GIS** will result in the display of the screen in Figure 84.

Identifying the GIS Shape File

Click **Browse**. Using the windows file manager dialog, navigate to the folder where the GIS shape file resides. Click on this file and then click **Open**. The path to the shape file's location will be displayed in the gray window above the **Browse** button.

Figure 84 - The Correct Fire Locations from GIS Lay Dialog



Discovery Date and Fire Number
In the cells provided, enter the field name for the fire's Discovery Date and the Fire Number in the database that supports the GIS shape file.

NIFMID Identifier
In the cells provided, enter the field name for the fire's Agency, Administrative Unit, Year of Discovery and the Fire Number in the database that supports the GIS shape file.

PCHA Record Number
In the cell provided, enter the field name for the fire's PCHA Record Number in the database that supports the GIS shape file.

Define Polygons

PCHA has the ability to count the number of fires and acres within each polygon of a GIS shape file. For example, the planner could use a watershed polygon shape file to count the number of fires within each watershed.

Prior to preparing such a report of fires and acres by polygon, PCHA must contain information about the polygons to use. Selecting the **GIS => Define Polygons** menu will yield the dialog box shown in Figure 86.

Figure 85 – The Define Polygons Menu

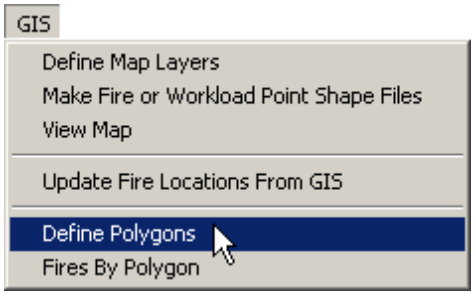
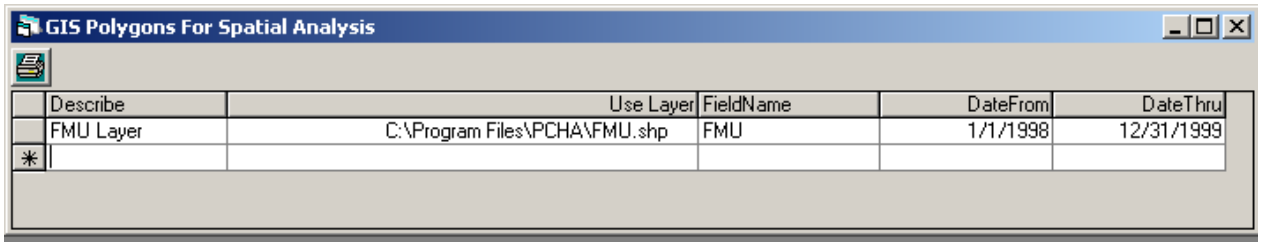


Figure 86



Describe Column

Enter a brief description of the polygons desired for use.

Use Layer Column

Use the pull-down list to select the GIS layer previously entered into your list of Map Layers.

Field Name Column

Enter the name of the field in this layer that is to be used to label the polygons.

Date From Column

Enter the starting date for the fires you want to count. Complete this entry for all data layers even though it may not apply, i.e. FMU data layer.

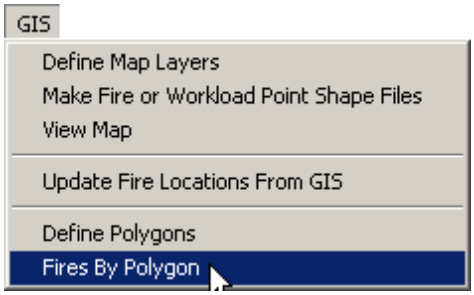
Date Thru Column

Enter the ending date for the fires you want to count. Complete this entry for all data layers even though it may not apply, i.e. FMU data layer. Click on the **X** in the upper right corner to save and exit.

Fires by Polygon

Use this menu item to count the number of fires and acres burned within each polygon of a layer you have already defined using the **GIS => Define Polygons** menu item. Selecting this menu item will produce a window similar to the one in Figure 88.

Figure 87 – The Fires by Polygon Menu



Previously-Defined Polygon Layer To Use

Select from the list of polygons you have created (Figure 88).

From Date

Enter the starting date for fires.

Thru Date

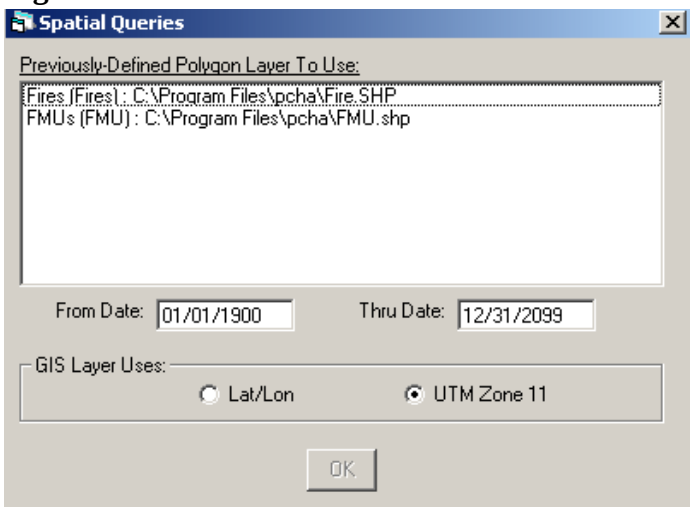
Enter the ending date for fires.

GIS Layer Uses

Select Lat/Lon or UTM.

Click **OK** and the process will begin, using the PCHA map display. When it has completed the process, the map will disappear, and a two-section report will be shown.

Figure 88



The first section, as shown in Figure 89, shows the number of fires, listed by statistical cause for each of the polygons.

Figure 89

Sequoia National Forest
PCHA99
Fire History By GIS Polygon: 01/01/1900-12/31/2099
WildCAD
Part I: Fire Frequency

DATA	Unknown	Lightning	Equipment	Smoking	Campfire	Debris Bu	Railroad
12		1					
17		14		4	5		
18		89	4	11	32	3	
19		13			1		
20		11	1		1		

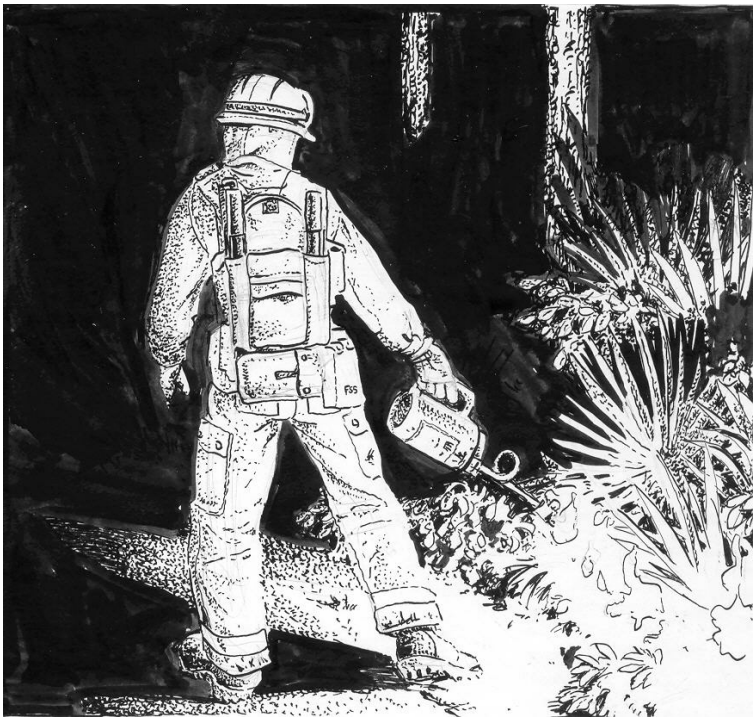
The second portion of the report shows acres burned, listed by statistical cause within each polygon (Figure 89).

Figure 90

PCHA99
Fire History By GIS Polygon: 01/01/1900-12/31/2099
WildCAD
Part II: Acres Burned

DATA	Unknown	Lightning	Equipment	Smoking	Campfire	Debris Bu	Railroad
12							
17		19		8	1		
18		32	1	1	60	5	
19		9					
20		53	4				
21		329		25	240		

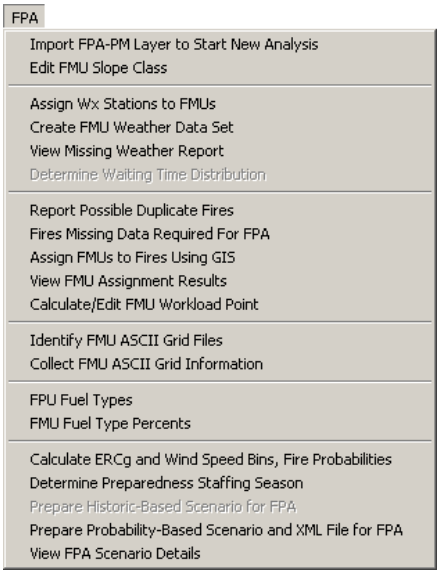
These reports can be printed by clicking on the printer icon in the upper left corner of the screen. The name of the file holding this text file is shown on the window title bar.



The FPA Menu

The items on the FPA menu facilitate the processes that are unique to the use of PCHA to support the creation of a fire event scenario in FPA.

Figure 91 – The FMA Menu



Fire Event

A fire event is a single wildland fire measured in time from its estimated ignition time through its life, until out. A fire event is the collective sum of attributes that describe the statistical and physical characteristics of the fire. The attributes assigned to a fire event are shown in Table 24

Fire Identifier

This is an internal identifier assigned by PCHA to the fire event.

Table 24

• Fire Identifier • Sensitivity Period (26 in a year) • Date Identifier (Julian Date) • Fire Discovery Time • Fire Cause (Human or Natural) • Simultaneous Fire (Yes/No) • Fire Management Unit (FMU) • ERCg for Ignition Date • BIg for Ignition Date • NFDRS Slope Class	• Elevation (feet) • FBPS Surface Fuel Model • Rate of Spread • Fire Intensity Level • Spread Minutes Until Civil Sunset • Final Fire Size (Wildfire) • WFU Fire Duration (Successful WFU Fire) • Final Fire Size (Successful WFU Fire) • Final Fire Size (Unsuccessful WFU Fire)

Sensitivity Period

This is the time period, measured in two-week intervals throughout the calendar year, used for describing the resource/fire management objective.

Date Identifier

This the Julian date of the fire event ignition.

Fire Discovery Time

This is the fire event discovery time expressed in military time.

Fire Cause
If the fire statistical cause is not lightning then it is human-caused. This attribute of a fire event is used in the decision process for possible assignment of a fire event as a candidate wildland fire use fire.

Simultaneous Fire (Yes/No)
If two more or fires occur on the same day in the FPU, each of these fires is designated as a simultaneous fire.

Fire Management Unit (FMU)
This is the internal FMU identifier assigned to the FMU by the FPA-PM program.

ERCg for Ignition Date
This is the NFDRS Energy Release Component (ERC) using fuel model G calculated using the weather data set for an FMU. This attribute of a fire event is used in the decision process for possible assignment of a fire event as a candidate wildland fire use fire.

BIg for Date
This is the NFDRS Burning Index (BI) using fuel model G calculated using the weather data set for an FMU. This attribute of a fire event is used in the decision process for possible assignment of a fire event as a candidate wildland fire use fire.

NFDRS Slope Class
This is the NFDRS slope class at the ignition location for the fire. It is used in FPA-PM as one input to the determination of fire preparedness resource fireline production rate.

Elevation (feet)
This is the elevation above sea level for the fire ignition point. It is used in FPA-PM to regulate helicopter use on the fire event.

FBPS Surface Fuel Model
This is the FBPS fuel model. It is used in FPA-PM as one input to the determination of fire preparedness resource fireline production rate.

Rate of Spread
This is the forward rate of spread of the fire on the day of discovery.

Fire Intensity Level (FIL)
This is the fire intensity level of the fire on the day of discovery. The FIL is determined by the flame length (Table 25).

Table 25

FIL	Flame Length
1	0 – 2.0 feet
2	2.1 – 4.0 feet
3	4.1 – 6.0 feet
4	6.1 – 8.0 feet
5	8.1 – 12.0 feet
6	12.1+ feet

Spread Minutes Until Civil Sunset
This is the number of minutes from the fire discovery time to 30 minutes after sunset.

Final Fire Size (Wildfire)
This is the fire size if the fire event is not contained b FPA-PM.

WFU Fire Duration (Successful WFU Fire)
This is the number of days from the WFU fire event's discovery date until the date of the fire ending weather event.

Final Fire Size (Successful WFU Fire)
This is the fire size for a fire event that the FPA-PM manages as a WFU fire.

Final Fire Size (Unsuccessful WFU Fire)
This is the fire size for fire event that is a candidate WFU fire and FPA-PM does not manage as a WFU fire.

Fire Event Scenario

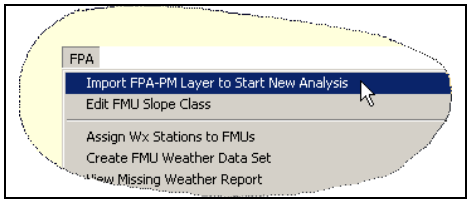
A fire event scenario is a representation of the annual initial response fire activity based on historic fire occurrence. The fire event scenario is a collection of fire events based on probabilities or defined deterministically for use in FPA-PM. There are two processes that are used to define a fire event scenario.

Probability-based Fire Event Scenario
Random draws from fire occurrence distributions are used to generate the fire events in a fire event scenario. Historic fire frequency is one foundation of the process. Fuel moisture values and a wind speed are assigned to a fire event based on probability distributions generated using historic weather data. Topographic and fuel conditions are also determined by a random draw based on the relative occurrence of these attributes.

Historic-based Fire Event Scenario
PCHA selects a single staffing season to determine the fire discovery date and fire discovery time for the fire events in a fire event scenario. Fire behavior for each fire event is determined using the same weather conditions on the date the fire occurred as well as the topographic and fuel conditions that it burned in as defined in the agency's corporate fire report.

Import FPA-PM Layer to Start New Analysis

Figure 92

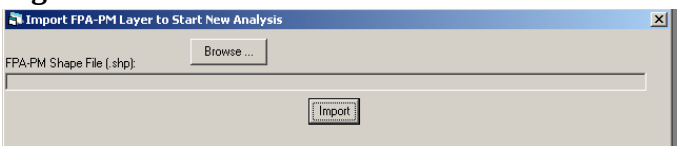


PCHA needs certain information regarding the FPU. PCHA needs the unique system provided identifier used by FPA-PM to identify the FPU. This identifier is necessary so that the two programs, FPA-PM and PCHA, are able to merge their respective data. PCHA needs to know the FPU name. PCHA needs a GIS shape file of the FMUs in the FPU. The attributes of the shape file provide information on a unique FMU identifier and FMU name.

Before this menu item can be implemented, the user must download the GIS shape file created by FPA-PM. The file created will be a zip file. Extracting that file will yield three files:

- fmu.dbf
- fmu.shp
- fmu.shx

Figure 93



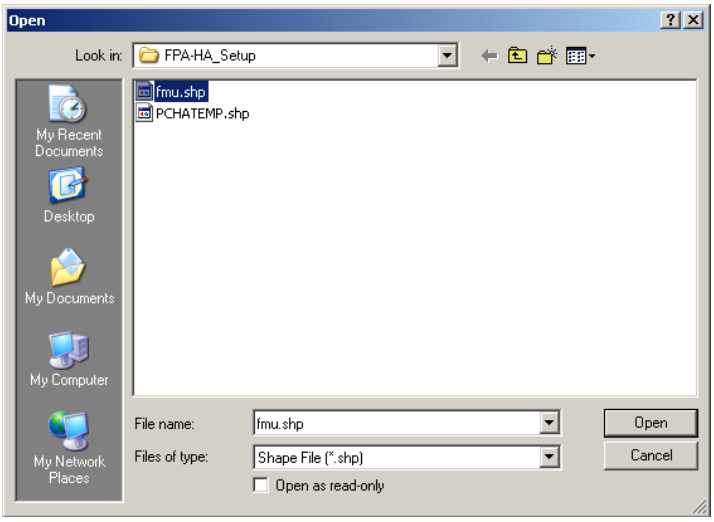
Selecting the **FPA = > Import FPA-PM Layer to Start New Analysis** menu will bring up the screen in Figure 93.

Click **Browse** to open the Windows File Manager dialog box which allows the planner to navigate to the folder where the GIS shape files have been download from FPA-PM (Figure 93).

Click on the fmu.shp file and then click **Open**. The screen in Figure 93 will reappear with the path to the file displayed in the gray window.

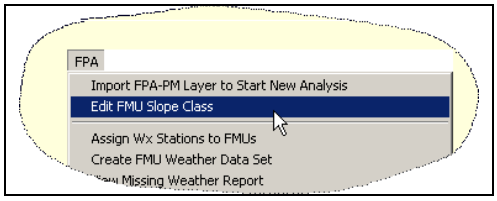
Click **Import** to complete the activity.

Figure 94



Edit FMU Slope Class

Figure 95



An average NFDRS slope class needs to be assigned to each FMU (Table 26). Selecting the **FPA => Edit FMU Slope Class** menu will result in the display of the screen shown in Figure 96. The screen in Figure 96 is displayed as it would appear immediately following import of the FMUs shape file from FPA-PM using the **FPA = > Import FPA-PM Layer to Start New Analysis** menu.

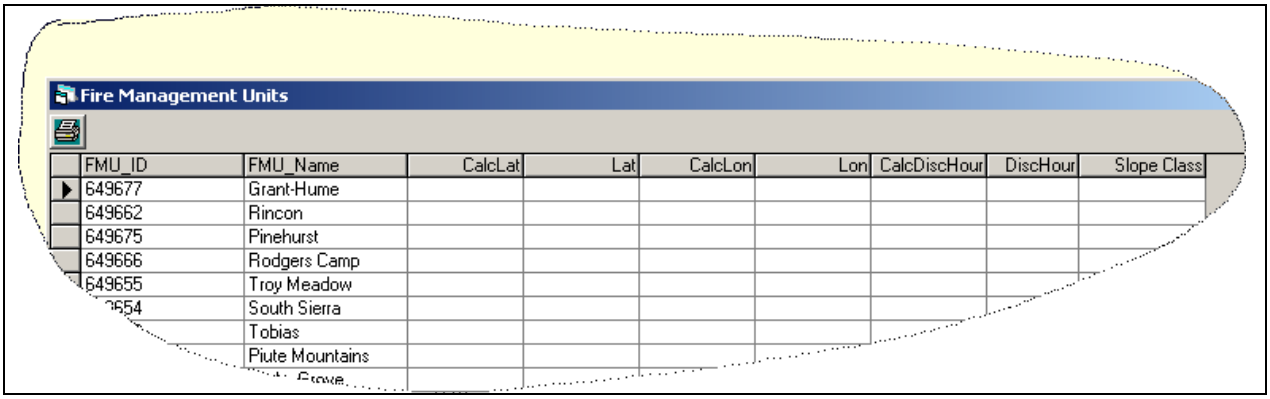
Table 26

NFDRS Slope Class	Slope Breaks	Slope Used
1	0 - 25%	22.5%
2	26 - 40%	31.8%
3	41 – 55%	44.5%
4	56 – 75%	63.6%
5	76+%	90%

Note there are field entries for the FMU_ID and the FMU_Name. All of the remaining columns have a blank field value since processes within FPA to populate this field have not occurred.

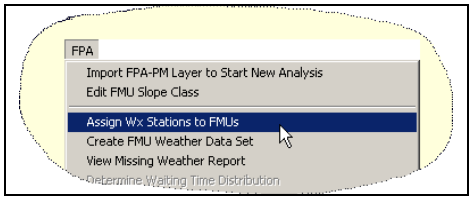
At this time, the planner should assign to each FMU a representative average NFDRS slope class. Click in the cell on the row with the FMU-Name in the Slope Class column. The five slope class options as shown in Table 26 will appear. Click on the desired slope class.

Figure 96



Assign Weather Station to FMUs

Figure 97



This menu item will facilitate the assigning in priority order of the weather station and the observation day to be used to assign a weather observation to each day within the analysis period. Once completed, PCHA can then create a weather data set for each FMU using the **FPA => Create FMU Weather Data Set** menu**.**

Before this menu activity can be completed, the planner needs to have defined a weather station using the **File => Weather Stations** menu.

Selecting the **FPA => Assign Weather Station** to FMUs menu will result in the display of the dialog similar to the one shown in Figure 98. As initially displayed, the FMU list will appear in the window on the left and the other two windows will be blank. Clicking on an FMU will cause the weather stations defined via the **File => Weather Stations** menu to be displayed. Note that for each weather station, there are three options provided for a weather observation. These are the day of interest, the day prior to the day of interest and two days prior to the day of interest. These will be referred to as weather station/observation day combinations.

To assign the primary weather station/observation day combination to the FMU, click on it in the center window and then click =>>. In the example in Figure 98, selecting the weather station 044701 (Ash Mountain) as the primary weather station/observation day combination would result in a screen as shown in Figure 99.

Figure 98

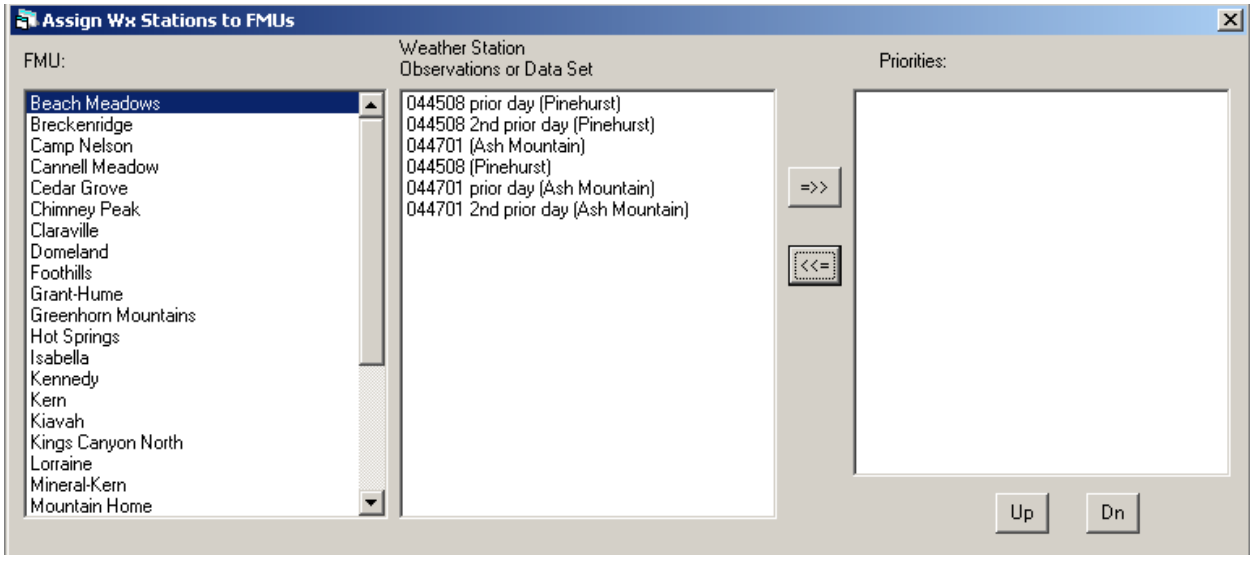
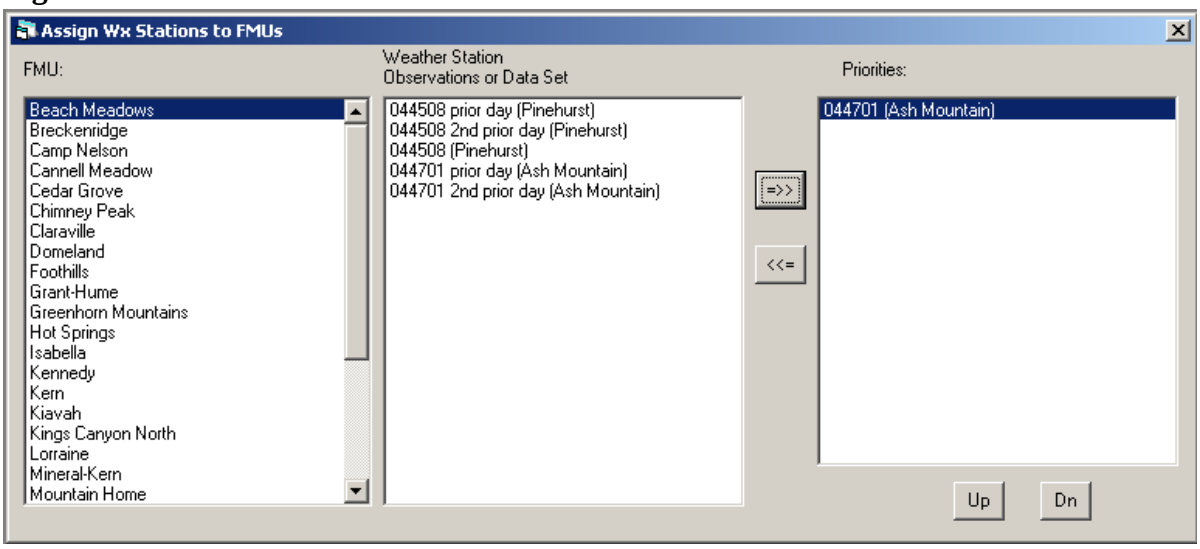


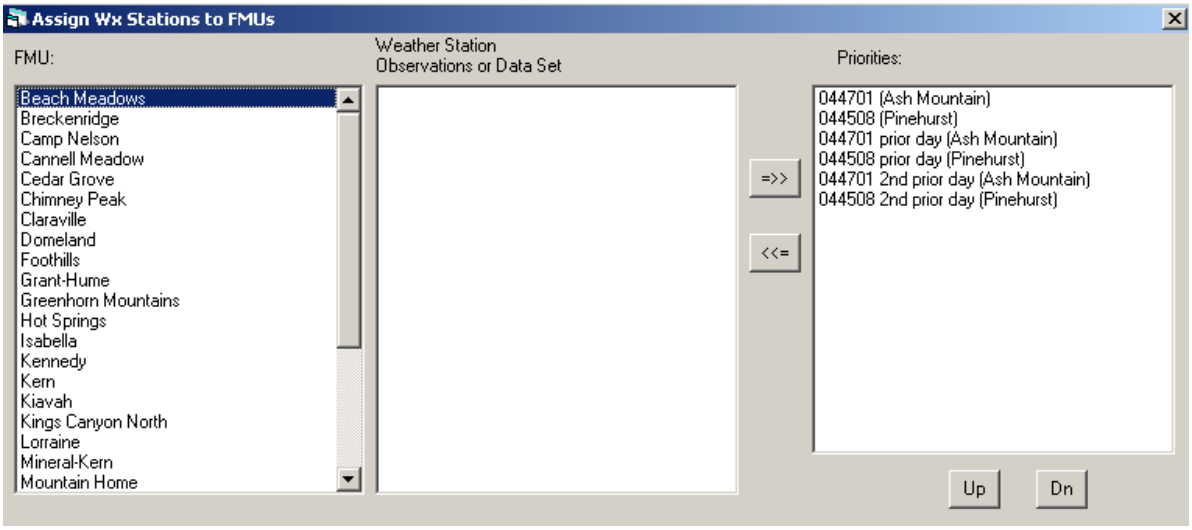
Figure 99



Assigning weather station/observation day combinations might result in a priority listing as shown in Figure 100. The planner should continue this process for each FMU.

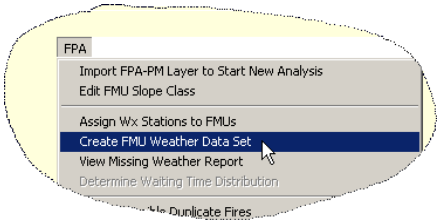
By clicking on a weather station/observation day combination in the right window, the planner can move that weather station/observation day combination up or down in the priority listing by clicking **Up** or **Down**.

Figure 100



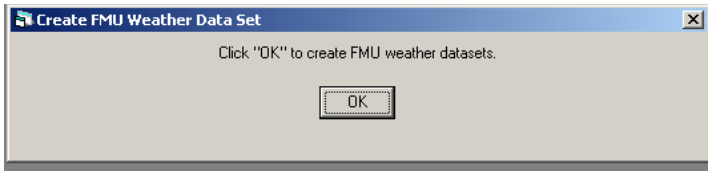
Create FMU Weather Data Set

Figure 101



This menu item will facilitate the assignment of a weather observation to each day within the analysis period. This is done for each FMU and the resulting assignments allow for the definition of a weather data set for the FMU. The weather observations assigned to a day for each FMU is based on the prioritization of weather station/observation day combinations accomplished using the **FPA => Assign Weather Station to FMUs** menu. The **FPA => Assign Weather Station to FMUs** menu activity must be completed before this activity.

Figure 102



Selecting the **FPA => Create FMU Weather Data Set** menu will result in the display of the dialog in Figure 102. To proceed, click **OK**. PCHA will display the FMUs' names as it works, finally displaying a Done message. To complete the activity, click **OK** in the Done dialog box.

View Missing Weather Report

Selecting this menu will result in the preparation of a report similar to the one shown in Figure 105.

Select the **FPA => View Missing Weather Report** menu and the dialog in Figure 104 will appear. Check the box if you desire to see a listing of FMU/date combinations with no weather observation assignment within the Fire Preparedness Staffing Season. If this box is unchecked, the listing will be done of the entire year.

Figure 103

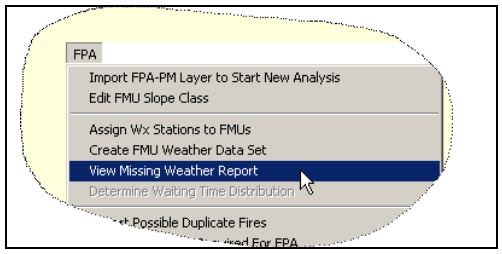
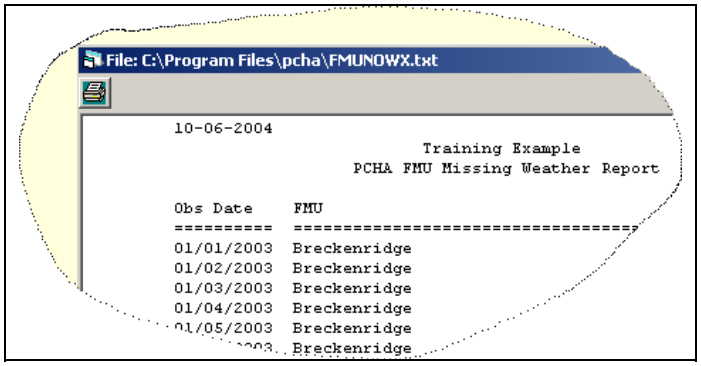


Figure 104

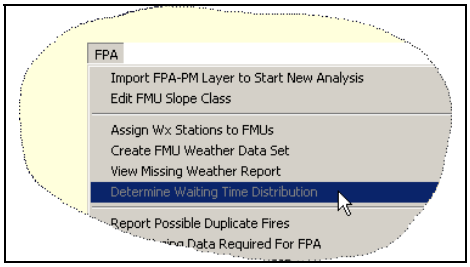
Figure 105



Determine Waiting Time Distribution

Reserved for later completion.

Figure 106



Report Possible Duplicate Fires

With interagency partners participating in an FPU, it is possible for a historic fire to have a fire report record for each agency in the database. This can happen if both agencies that responded to the fire completed their agency's fire report.

Selecting **FPA => Report Possible Duplicate Fires** will result in the display of the dialog in Figure 108. Click **OK** to have PCHA prepare the report.

This menu item will produce a report that contains possible duplicate fire report records. An example report is shown in Figure 109. Note: the Paradise fire has a fire report record from both the Forest Service and the BLM.

Figure 107

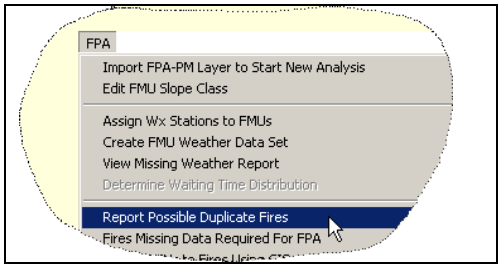
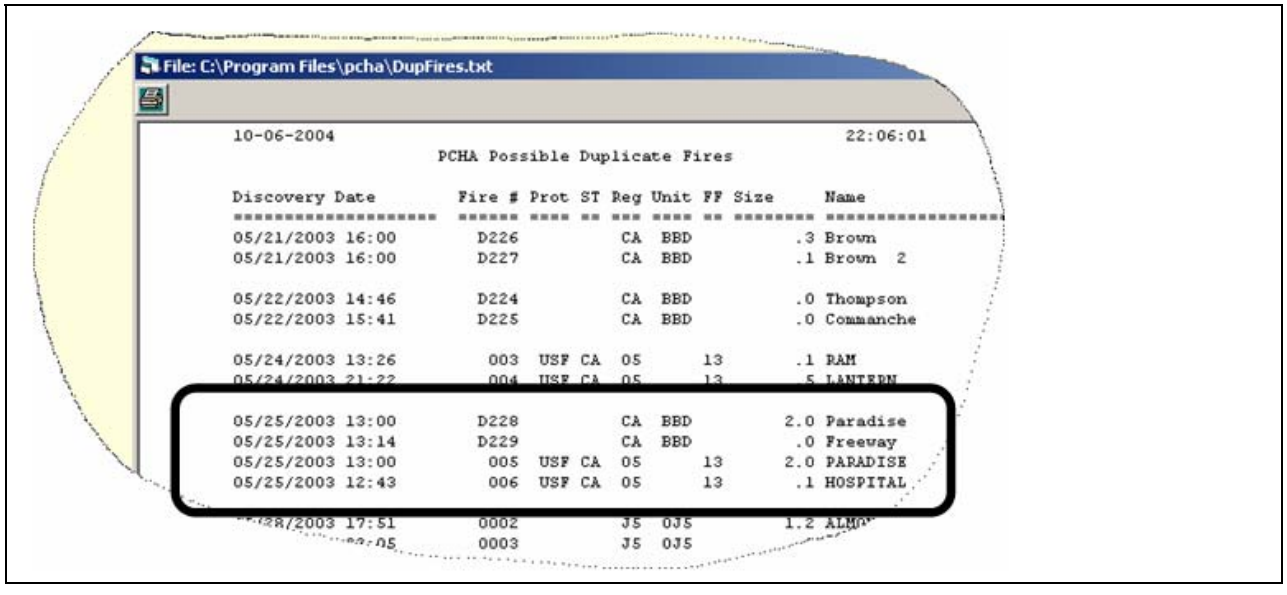


Figure 108

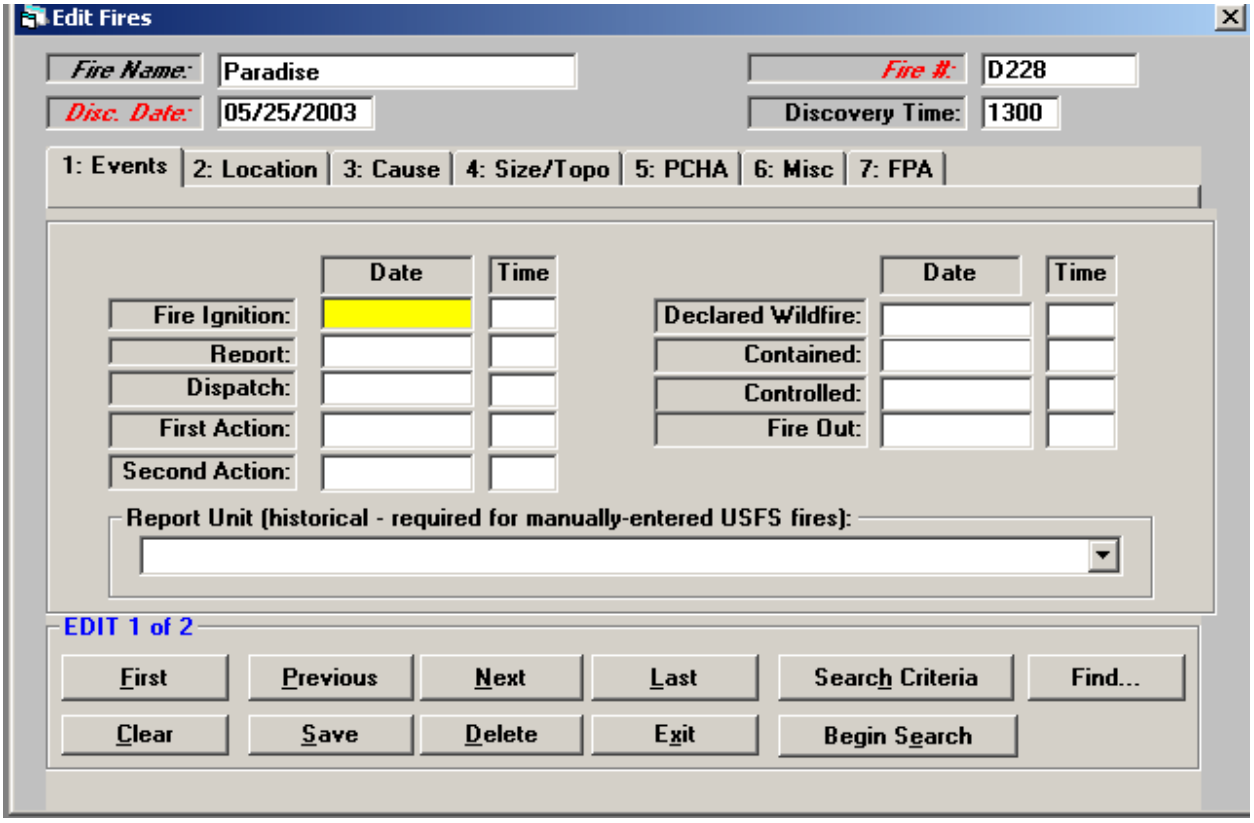
Figure 109



It is recommended that the fire record from the agency that manages the land be the fire record retained. The fire that is the duplicate record can also be removed from the analysis by checking the box on the FPA tab to exclude duplicate fires.

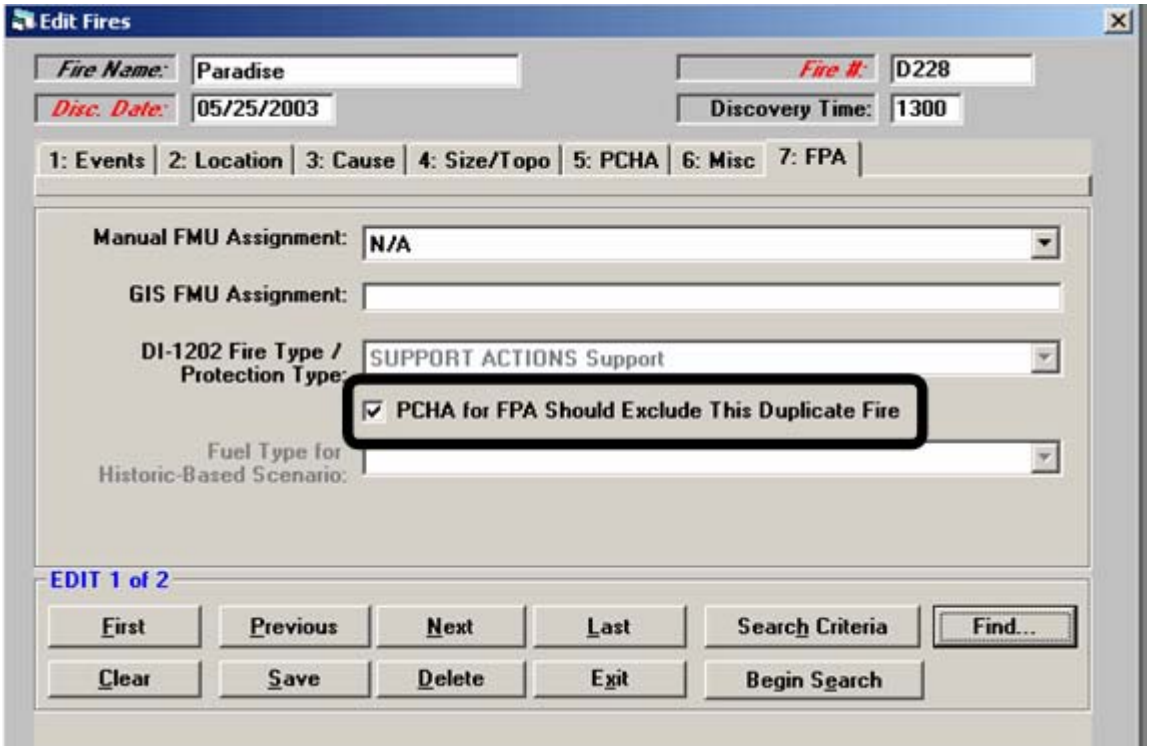
To designate a fire record as a duplicate record, select **Fire => Edit Fires => FPA**. Note: the Paradise Fire occurred on 5/25/2003. Click **Search Criteria**. Enter Paradise in the *Fire Name* cell and 5/23/2003 in the *Discovery Date* cell. Click **Begin Search**. The dialog in Figure 111 will appear. Note the text in the lower left "EDIT 1 of 2." This indicates two fire records have been selected.

Figure 110



The Paradise fire was located on Forest Service land so the Forest Service fire record should be the one used in PCHA. Select the BLM fire record and click on the **FPA** tab. Click in the box titled PCHA for FPA Should Exclude This Duplicate Fire (Figure 111). Then click **Save**.

Figure 111



Fires Missing Data Required for FPA

Required information from the fire report for each historic fire to be used for the probability-based fire event scenario process includes:

- Fire Type/Protection Type code for DOI agency fires
- Fire location
- Discovery date

Some information from the fire report for each historic fire is used to develop frequency distributions. Random draws from these distributions are used in the probability-based fire event scenario generation process. Frequency distributions are developed for:

- Discovery time
- Fire control date
- Statistical cause

These are desired data fields and there needs to be an adequate number of fires with values for these so the frequency distributions can be developed.

Figure 112

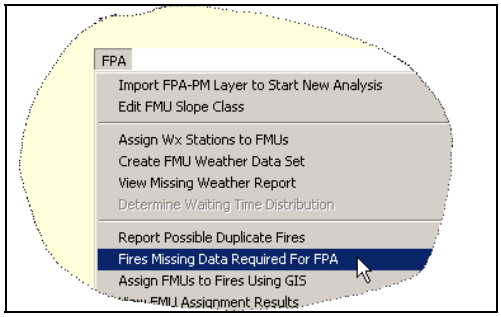
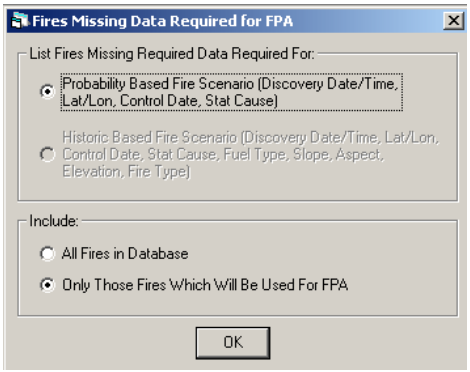
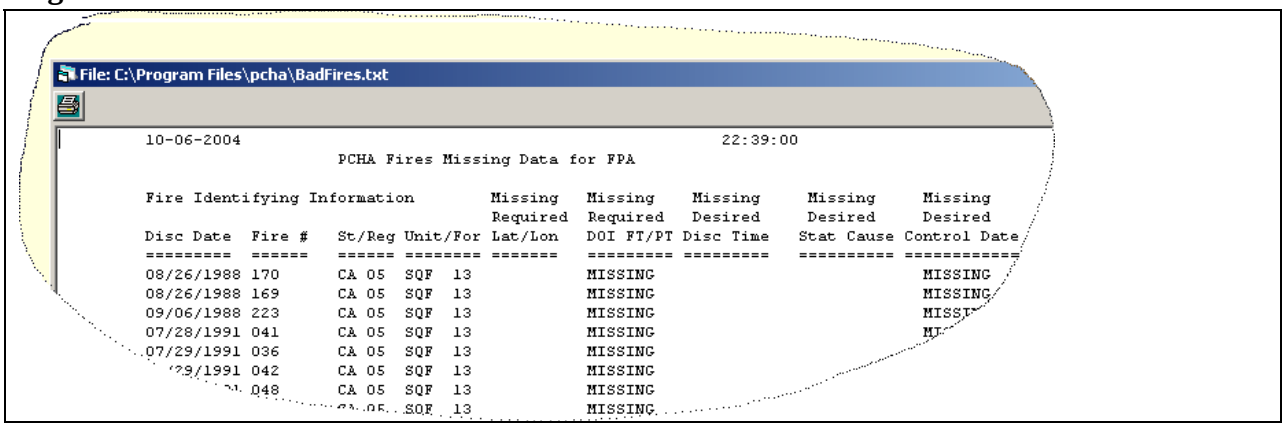


Figure 113



Selecting **FPA => Fires Missing Data Required for FPA** will result in the display of the dialog in Figure 113. Select the fires you desire to include and then click **OK** to have PCHA prepare the report. This menu item will produce a report that lists fire records with some missing required and/or desirable data fields. An example report is shown in Figure 114.

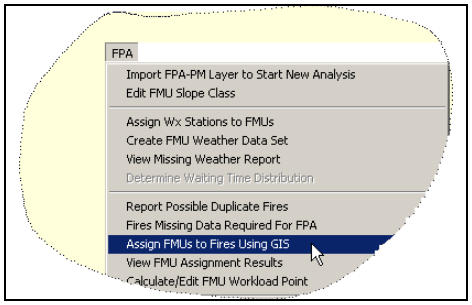
Figure 114



Assign Fires to FMU Using GIS

This menu item facilitates the assignment of an FMU to each historic fire. This is done using the GIS capability within PCHA. All fires must have a location expressed in latitude and longitude. In addition, this location needs to be checked for accuracy.

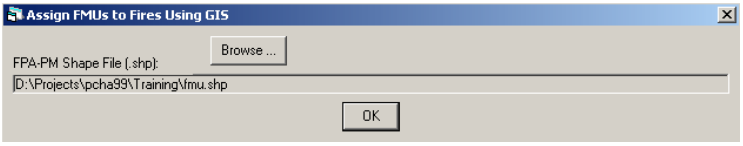
Figure 115



Selecting the **FPA = > Import FPA-PM Layer to Start New Analysis** menu brings up the screen in Figure 116.

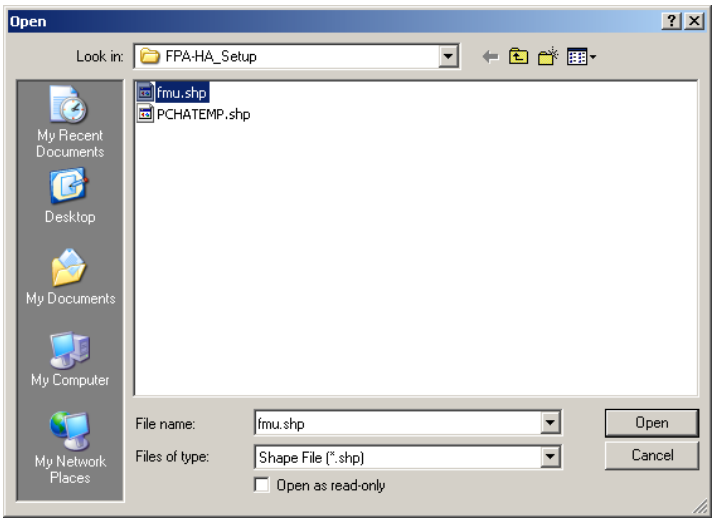
Click **Browse** to open the Windows File Manager dialog box allowing the planner to navigate to the folder where the GIS shape files have been downloaded from FPA-PM (Figure 117).

Figure 116



Click on the fmu.shp file and then click **Open**. The screen in Figure 116 will reappear with the path to the file displayed in the gray window.

Figure 117



Click **OK** to complete the activity. PCHA will do this assignment and when complete, a dialog will appear indicating Fires have been assigned. Click **OK**.

View FMU Assignment Results

This menu item produces a report showing the assignment of fires to FMUs and a listing of fires that have not been assigned to an FMU. The most likely reason a fire would not be assigned to an FMU is the location of the fire is outside of all FMU boundaries.

Selecting the **FPA = > View FMU Assignment Results** menu will produce the screen in Figure 119. Click **OK** and a report similar to the excerpt shown in Figures 120 and 121 will appear. Figure 120 shows the first part of the report with the number of fires assigned to each FMU. Figure 121 shows the second part of the report, which is a listing of fires that have not been assigned to an FMU.

Figure 118

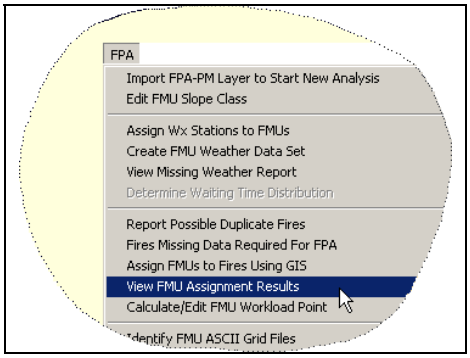


Figure 119

Figure 120

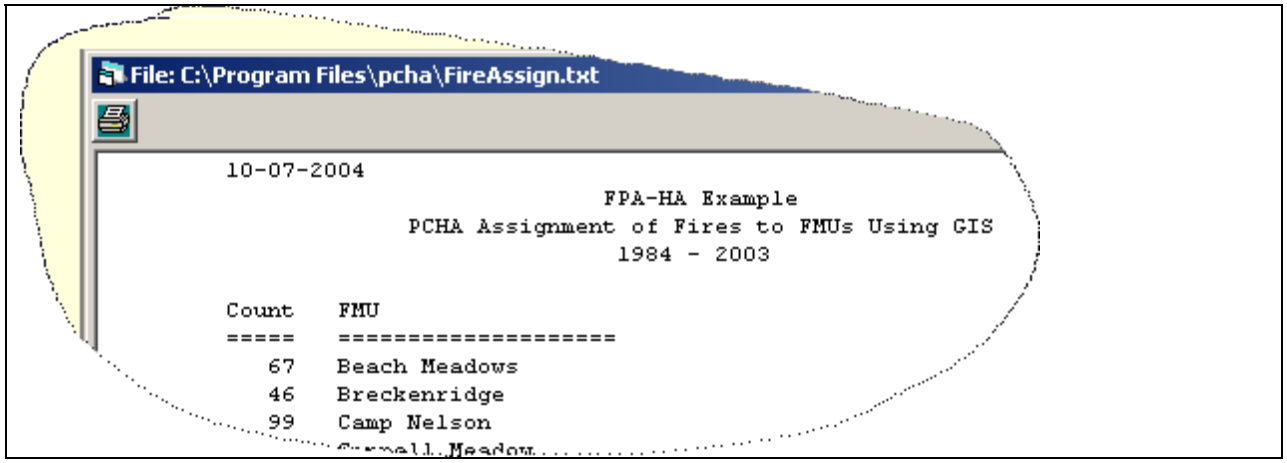
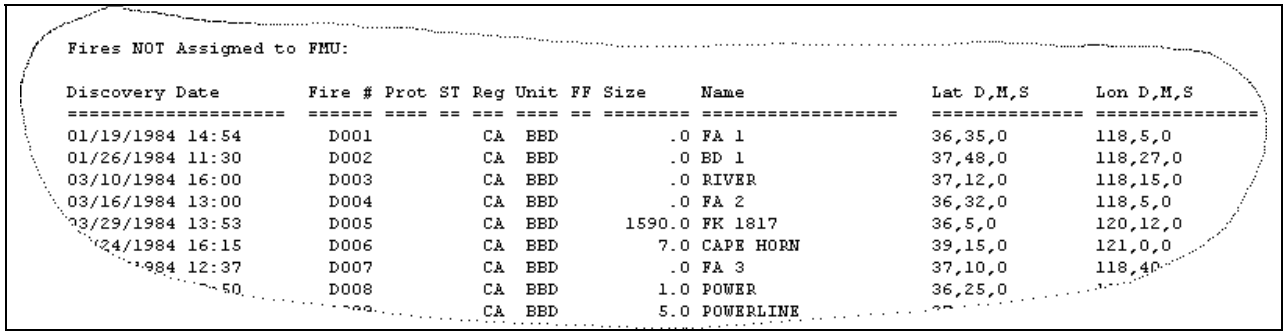


Figure 121

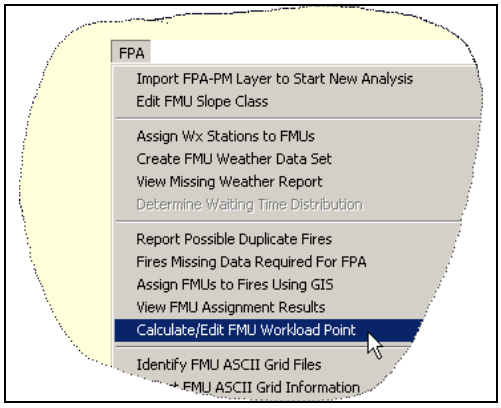


Fires NOT Assigned to FMU:

Discovery Date	Fire #	Prot	ST	Reg	Unit	FF	Size	Name	Lat D,M,S	Lon D,M,S
01/19/1984 14:54	D001		CA	BBD			.0	FA 1	36,35,0	118,5,0
01/26/1984 11:30	D002		CA	BBD			.0	BD 1	37,48,0	118,27,0
03/10/1984 16:00	D003		CA	BBD			.0	RIVER	37,12,0	118,15,0
03/16/1984 13:00	D004		CA	BBD			.0	FA 2	36,32,0	118,5,0
03/29/1984 13:53	D005		CA	BBD			1590.0	FK 1817	36,5,0	120,12,0
/24/1984 16:15	D006		CA	BBD			7.0	CAPE HORN	39,15,0	121,0,0
984 12:37	D007		CA	BBD			.0	FA 3	37,10,0	118,40
50	D008		CA	BBD			1.0	POWER	36,25,0	
			CA	BBD			5.0	POWERLINE		

Calculate/Edit FMU Workload Point

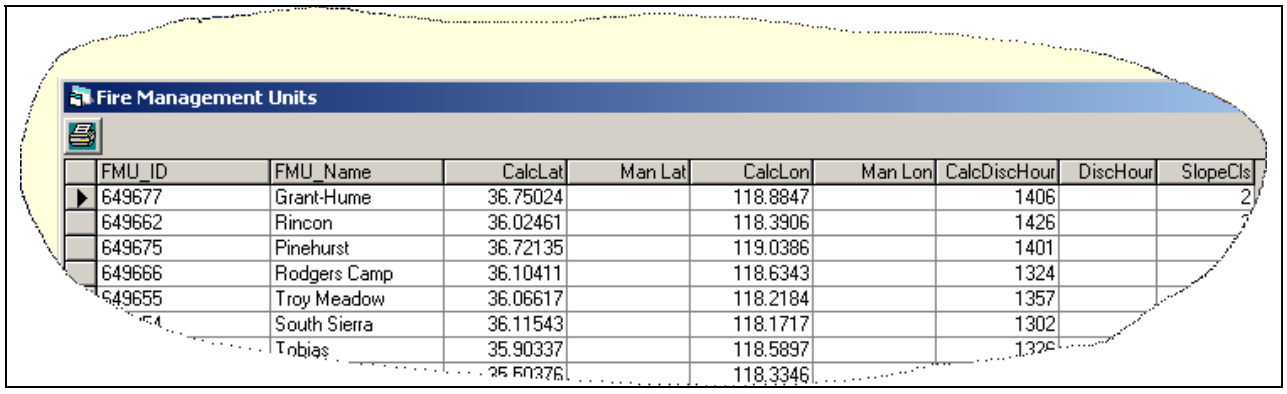
Figure 122



The FPA-PM model requires a fire workload point for each FMU. PCHA will determine this point by obtaining an average of all latitude and longitude locations for each fire included in each FMU. This menu item facilitates the calculation of a workload point for each FMU.

Selecting the **FPA = > Calculate/Edit FMU Workload Point** will implement this activity and a screen similar to the one in Figure 123 will appear. The PCHA calculated latitude and longitude are in the Calc Lat and Calc Lon columns respectively. The planner can override this calculated value by entering a latitude and longitude in the Man Lat and Man Log columns respectively. The workload point locations that are determined can be reviewed by using the features found in the GIS menu. The points can be displayed and mapped on the FMU polygons along with the fire locations.

Figure 123



FMU_ID	FMU_Name	CalcLat	Man Lat	CalcLon	Man Lon	CalcDiscHour	DiscHour	SlopeCls
649677	Grant-Hume	36.75024		118.8847		1406		2
649662	Rincon	36.02461		118.3906		1426		
649675	Pinehurst	36.72135		119.0386		1401		
649666	Rodgers Camp	36.10411		118.6343		1324		
649655	Troy Meadow	36.06617		118.2184		1357		
	South Sierra	36.11543		118.1717		1302		
	Tobias	35.90337		118.5897		1326		
		35.60376		118.3346				

Identify FMU ASCII Grid Files

An ASCII Grid file is a file containing alphanumeric values for landscape features such as slope, aspect and elevation. Digital Elevation Models (DEMs) are digital files consisting of points of elevations, sampled systematically at equally spaced intervals. DEM digital files are available for the entire United States from the U. S. Geological Service (USGS). The spatial relationship of these points is used to derive the slope and aspect values by referencing adjacent elevation points.

The fire planner needs to work with local GIS specialists to develop ASCII Grid files. Refer to the Appendix for guidelines on how to prepare these files. Each FMU must be totally enclosed within only one set of grid files. In other words, one grid file may include numerous FMUs (or the entire FPU), but an FMU may not be split, requiring two different grid files. FMU polygons may be discontinuous.

Grid File Naming
The planner will need matched sets of Grid files. The files in each set must exactly cover the spatial area. Each ASCII Grid file for an FMU must have a file name formatted as follows:

BaseFileName_DataLayer.asc,

- BaseFileName is an identifier such as CenOrEastside.
- DataLayer is the data that is in the Grid file.
- Each file in the set must have a file extension of .asc

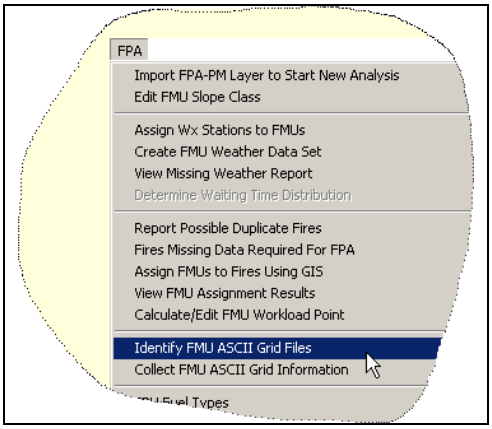
Table 27 provides a summary of the requirements.

Table 27

Attribute	Required in FPA	Data Layer ID	Example
Slope	Yes	slope	southsierra_slope.asc
Aspect	Yes	aspect	southsierra_aspect.asc
Elevation	Yes	elev	southsierra_elev.asc
FBPS Fuel Model		fuel	southsierra_fuel.asc
Canopy Cover		canopy	southsierra_canopy.asc
Canopy Base Height		cbh	southsierra_cbh.asc
Canopy Bulk Density		cbd	southsierra_cbd.asc
Stand Height		height	southsierra_height.asc

Once prepared, these files need to be imported into PCHA. Selecting **FPA => Identify FMU ASCII Grid Files** will facilitate this process (Figure 124).

Figure 124



The dialog in Figure 125 will be displayed. The dialog is used to identify to PCHA the folder location where the ASCII Grid files reside as well as the units of each of the Grid Files.

FMU
Use the pull-down to select the FMU the Grid file cover.

Units
Click the radio button on the Units area to designate the units the grid is in.

Elevation Grid File

Click **Browse** and use the Windows dialog to navigate to the file location where the BaseFileName_elev.asc file is located. In the example in Figure 125, the file location is displayed in the "Look in"cell and the file name is southernsierra_elev.asc. Note that all of the ASCII Grid files must reside in the same folder as the ASCII Grid elevation file. Click **Open** and the file path should appear in the cell to the right of the Elevation Grid File title (Figure 126).

Figure 125

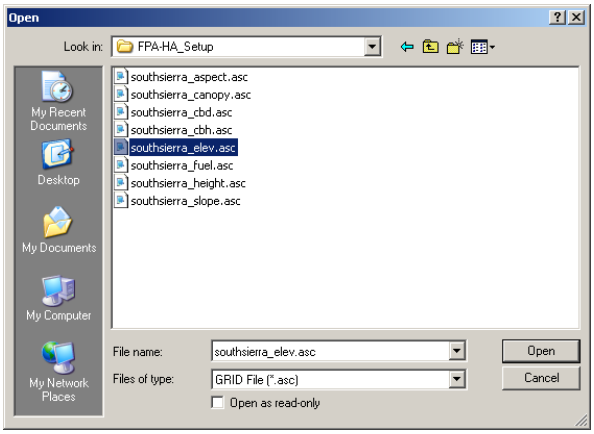
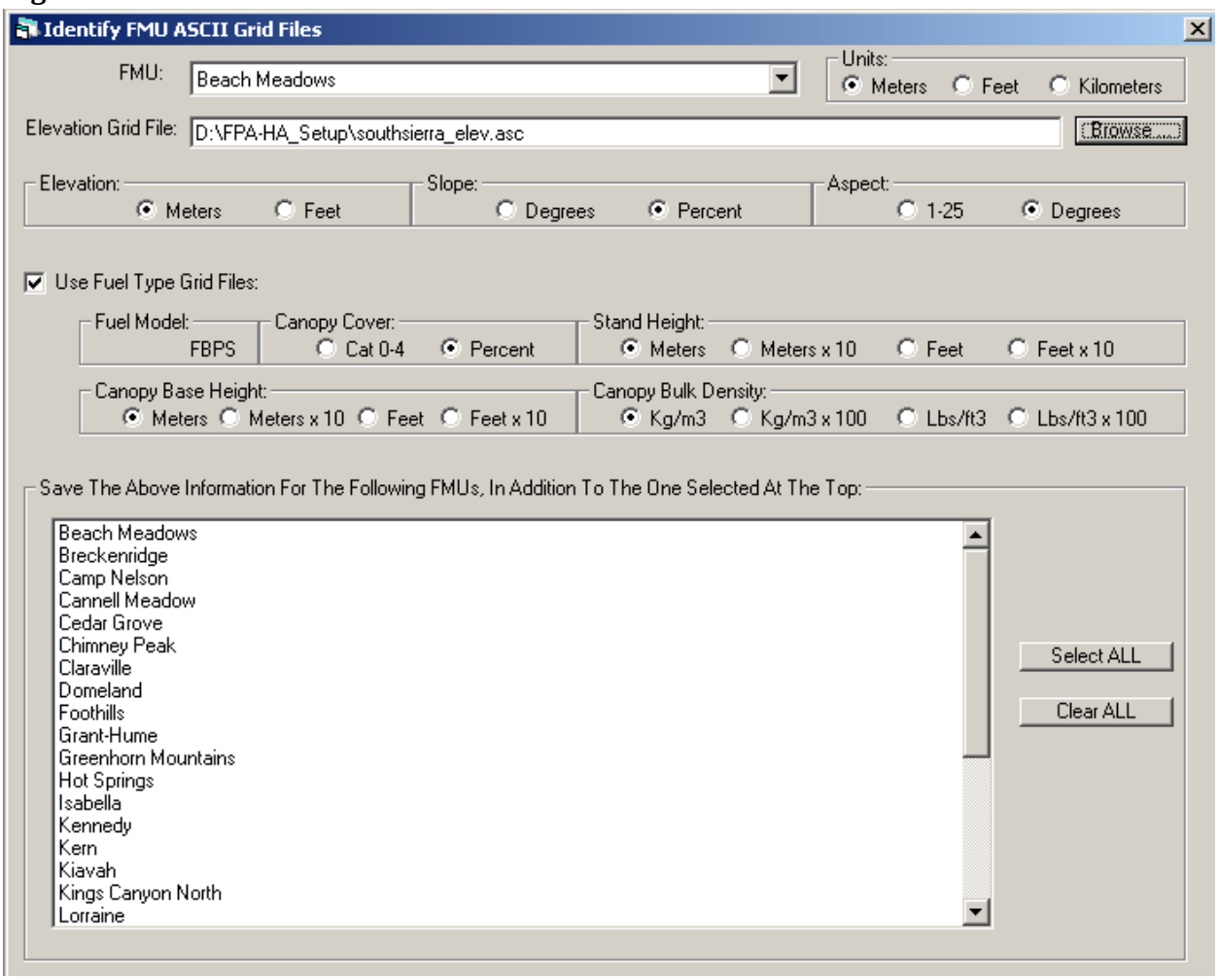


Figure 126



Units of the Slope, Aspect and Elevation Grid Files

Select the appropriate units for each of the topographic ASCII Grid data layers (Figure 127).

Figure 127

Elevation

Use the radio button to select either feet or meters.

Slope

Use the radio button to select either degrees or percent.

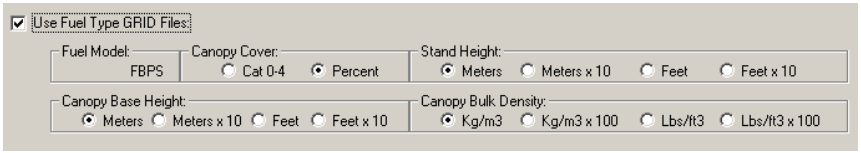
Aspect

Use the radio button to select either aspect category (1-25) or degrees.

Using Spatial Fuel Type Attribute Data Layers

If an ASCII Grid file will be use to define fuel types for an FMU, check the **Use Fuel Type GRID Files** box and select the appropriate units for each of the fuel type ASCII Grid data layers (Figure 128).

Figure 128



Fuel Model

The fuel models must be from the Fire Behavior Prediction System (FBPS) (Anderson 1982). No custom fuel models are allowed. Use fuel model 98 to designate water and fuel model 99 to designate unburnable.

Canopy Cover

Canopy cover is normally measured as a percent. It is based on the lineal length that is within a canopy versus in the open. Click the appropriate radio button to specify the units as either Category (0-4) (Table 28) or the percent.

Table 28 – Definition of Canopy Cover Categories

Category	Range	Used in Calculations
0	0%	0%
1	1 – 20%	10%
2	21–50%	35%
3	51-80%	65%
4	81-100%	90%

Stand Height

For an individual tree, height is the measurement to the top of the tree tip. Averaging the heights for all trees in a stand would give an estimate of the stand height. Click the appropriate radio button to specify either meters, meters * 10, feet or feet * 10.

Canopy Base Height (1-299 feet)

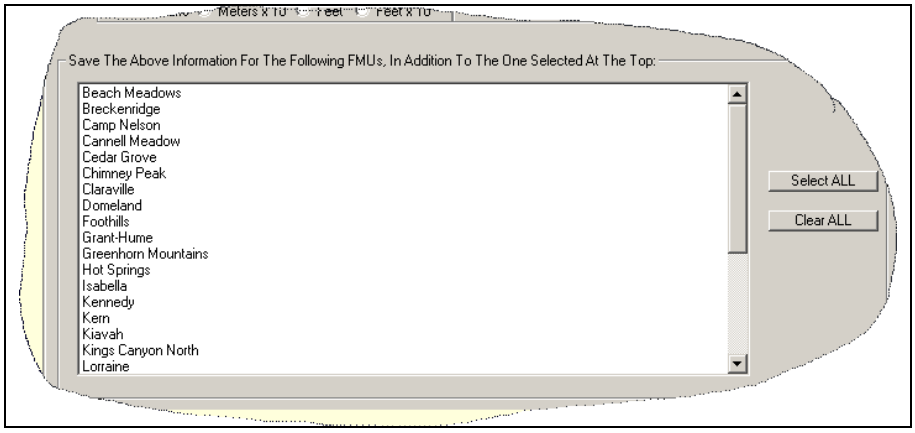
For an individual tree, the measurement of the height to the base of the crown can be made. The averaging of these values for all trees in a stand would give an estimate of the level of the stand canopy base height. Frequently, this is a measure of where the limbs of the canopy start vertically, but the number can be skewed by the presence of small trees or occasional live limbs. A more meaningful value would be the height above the ground of the first canopy layer where the density of the crown mass within the layer is high enough to support vertical movement of a fire. Click the appropriate radio button to specify either meters, meters * 10, feet or feet * 10.

Canopy Bulk Density (kg/m3)

Mathematically, canopy bulk density (CBD) (kg/m^3) is canopy biomass divided by the volume occupied by crown fuels. Canopy bulk density is hard to estimate in the field. Initially, it seems attractive to calculate this value by treating the canopy as a box with the depth ,the stand height, minus the canopy base height. Assuming this box covered an acre (43,560 ft^2), dividing the fuel loading in the canopy by the volume of box would provide an estimate of average canopy bulk density. Unfortunately, this estimate has a bias toward underestimation of the canopy bulk density due to the averaging of largely void areas in the top and bottom of the canopy with the more dense layers of foliage. A fire burning vertically within the crowns will most likely propagate through denser canopy layers. Click the appropriate radio button to specify either kg/m3, kg/m3 * 100, lbs/ft3 or lbs/ft3 * 100.

Assigning More Than one FMU to a Set of Grid Files

Figure 129

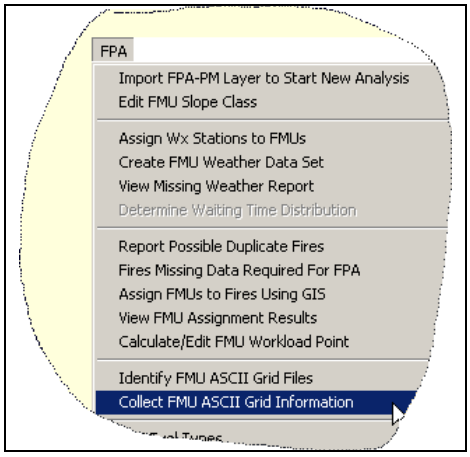


At the bottom of the dialog shown in Figure 129 is an area where the planner can identify additional FMUs that have the same set of GRID files as the one shown in the Elevation Grid File cell.

Click on an FMU to identify it as an FMU with the same set of GRID files as the one shown in the Elevation Grid File cell. Click **Select ALL** to identify all of the FMUs in the FPU to have the same set of GRID files as the FMU shown in the Elevation Grid File cell. Click **Clear ALL** to reverse the action from **Select ALL**.

Collect FMU ASCII Grid Information

Figure 130



This menu item facilitates the importing of the FMU ASCII Grid files into PCHA. Selecting **FPA = > Collect FMU ASCII Grid Information** menu will result in a dialog screen. The lower portion of that screen is shown in Figure 131. Click **Browse** to open the Windows File Manager dialog box to allow the planner to navigate to the folder where the GIS shape files have been downloaded from FPA-PM (Figure 132).

Click on the fmu.shp file and then click **Open**. The screen in Figure 131 will reappear with the path to the file displayed in the gray window.

Click **Ok** to complete the activity (Figure 131). PCHA will import the Grid files when the activity is complete, a dialog box will appear indicating the import has been completed. Click **OK**.

Figure 131

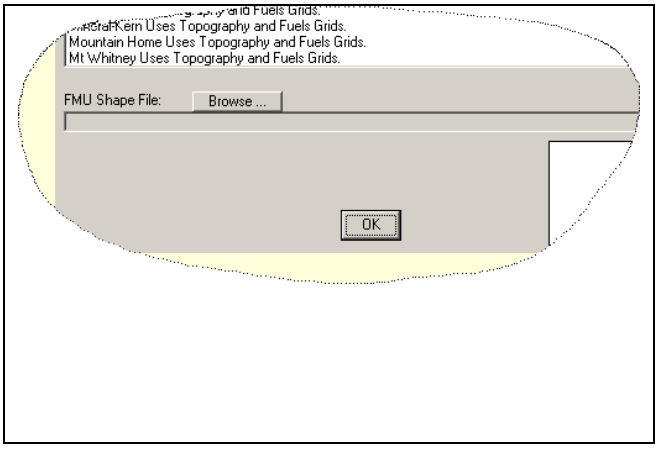
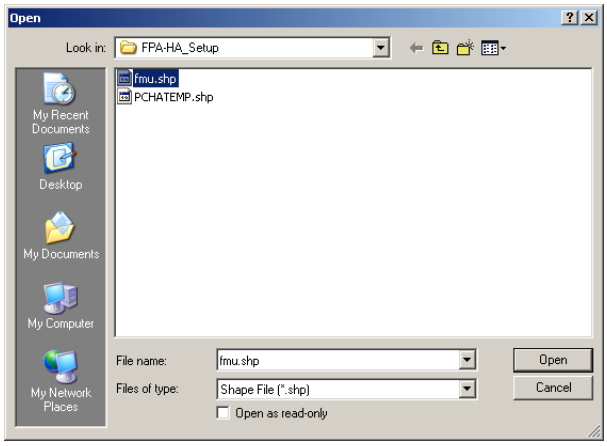


Figure 132



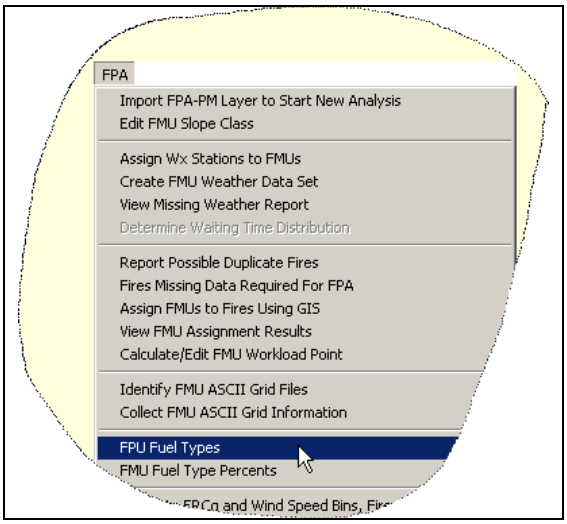
FPU Fuel Types

In review, a fuel type is a unique combination of the following:

- Canopy cover
- Surface (FBPS) fuel model
- Canopy base height
- Canopy bulk density
- Stand height

If at least one FMU in the FPU will have fuel types defined non-spatially, then the planner will need to define each of the fuel types. All fuel types that exist in any of the FMUs that will have fuel types defined non-spatially needs to be defined.

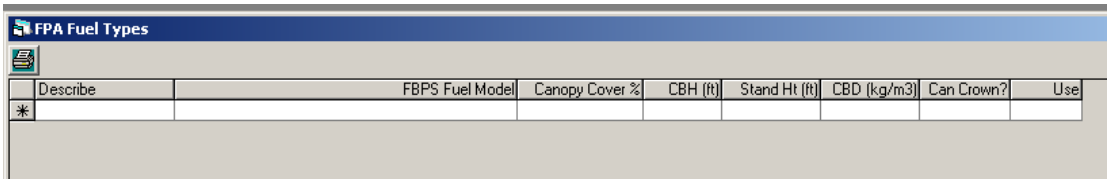
Figure 133



The information for fuel layers may be developed from existing vegetation data layers in administrative unit GIS files. The fire planner can determine the specific attributes needed for defining a fuel type with the assistance of other fire personnel having fuels expertise and a local silviculturist.

To define fuel types for the FPU, select **FPA => FPU Fuel Types** menu (Figure 133). The window shown in Figure 134 will appear.

Figure 134



The planner should complete the cell entries for all fuel types that are in FMUs that will have fuel types defined non-spatially. An example is shown in Figure 135.

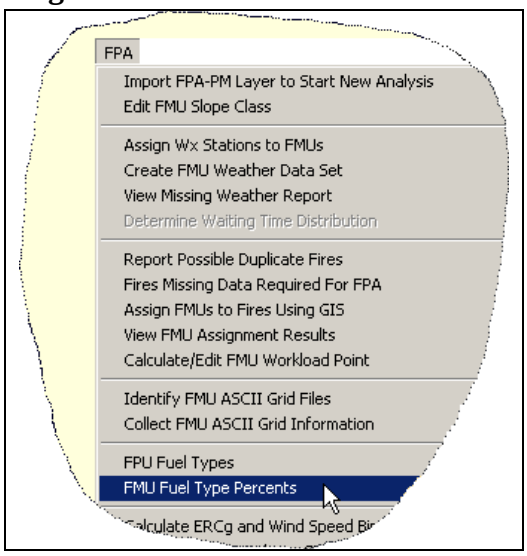
Figure 135

FPA Fuel Types

Describe	FBPS Fuel Model	Canopy Cover %	CBH (ft)	Stand Ht (ft)	CBD (kg/m3)	Can Crown?	Use
Small Pond. Pine	FBPS 2: Timber (grass and understory)	21-50	4	12	0.012	Yes	Yes
Pole Pond. Pine	FBPS 9: Hardwood (long-needle pine) litter	21-50	10	25	0.143	Yes	Yes
Mature Pond. Pine	FBPS 6: Dormant brush - hardwood slash	1-20	21	59	0.121	Yes	Yes
Meadow	FBPS 1: Short grass (1 ft.)	0	0	0	0	No	Yes

FMU Fuel Type Percents

Figure 136

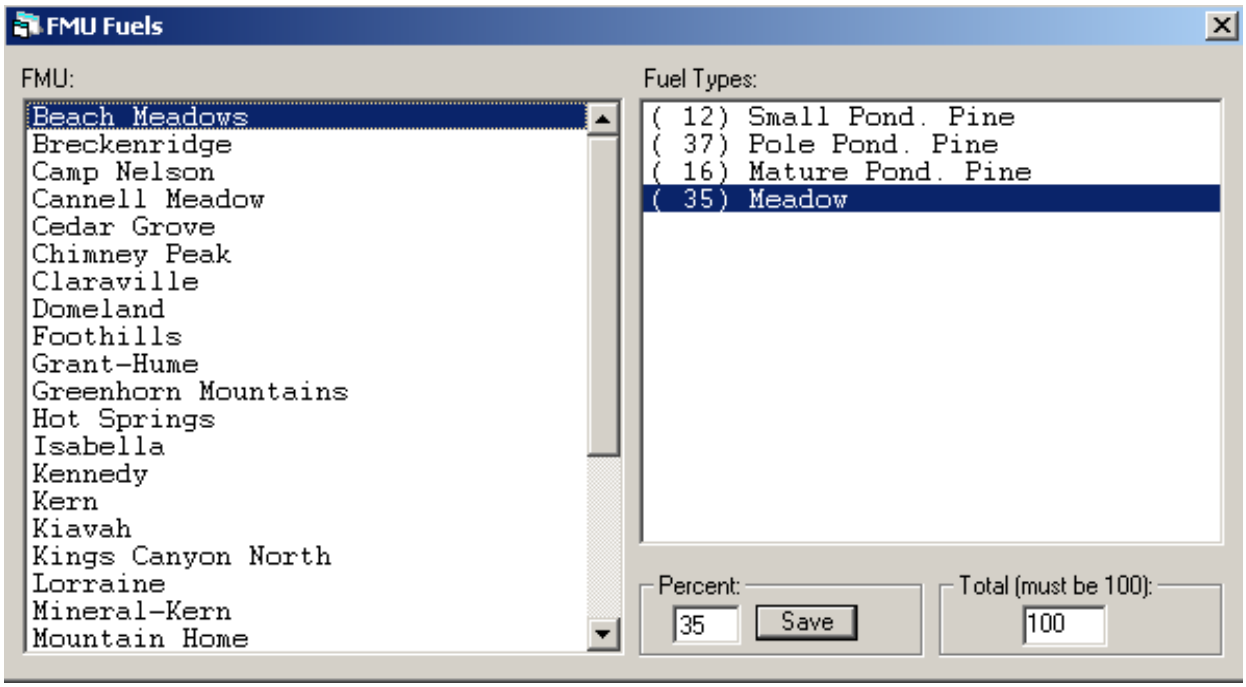


The planner needs to manually enter the proportion of each fuel type in each FMU that will have fuel types defined non-spatially. These proportions can be determined by using a GIS or by using professional judgment to estimate from remote sensing images.

Select **FPA => FMU Fuel Type Percents**. Click on an FMU to select it and a dialog similar to Figure 137 will appear. . Click on the fuel type desired in the right window. Enter the percent of the FMU that is in the fuel type in the box labeled Percent and then click **Save**. Do this for each fuel type in the FMU. Note that the sum of the percentages in an FMU must be 100%.

Also note that the entered values are not saved until the user clicks on another FMU name different from the one being defined.

Figure 137

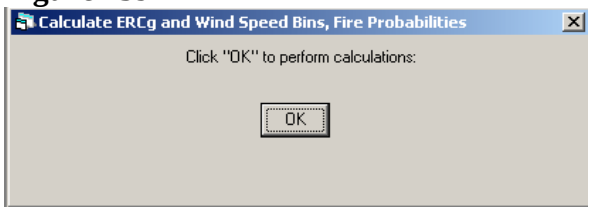


Calculate ERCg and Wind Speed Bins, Fire Probabilities

PCHA automates the creation of several necessary probability distributions and tables required for the creation of fire event scenarios. A detailed description of the process used by PCHA is contained in the FPA Reference Guide.

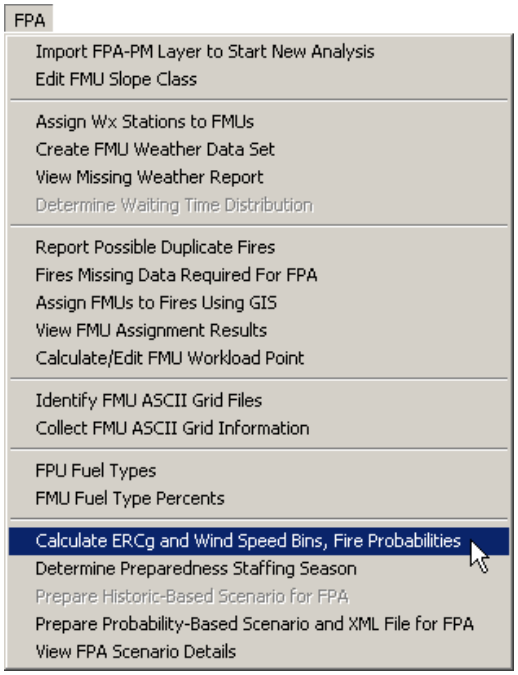
To perform this activity, click **FPA => Calculate ERCg and Wind Speed Bins, Fire Probabilities.** The dialog shown in Figure 139 will appear. Click **OK**.

Figure 139



When done, a Calculations Complete dialog will appear. Click **OK** to close that dialog screen.

Figure 138



Determine Preparedness Staffing Season

PCHA contains a screen that shows fire danger variables and a distribution of fire occurrence in a calendar year. To access this screen, select **FPA => Determine Preparedness Season** (Figure 140)**.** The screen in Figure 141 will be displayed. At the top, the planner can view a bar graph of ERCg, SCg or BIg through the year for the FPU. At the bottom of the screen, the planner can view average fire occurrence per day for the Analysis Period.

The Preparedness Season is then defined by the planner in the box in the lower right part of the screen. Note that multiple discontinuous periods can be designated. In Figure 142, there is a display of the time of the year when 90% of the fires happen and is noted as the fire preparedness staffing season in this example.

Figure 140

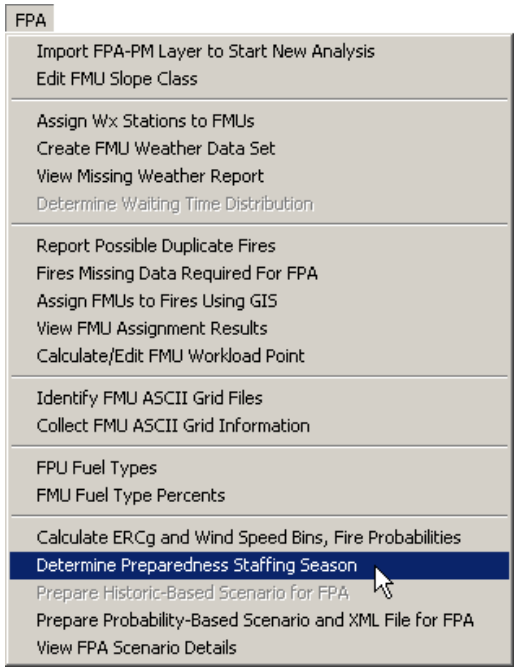


Figure 141

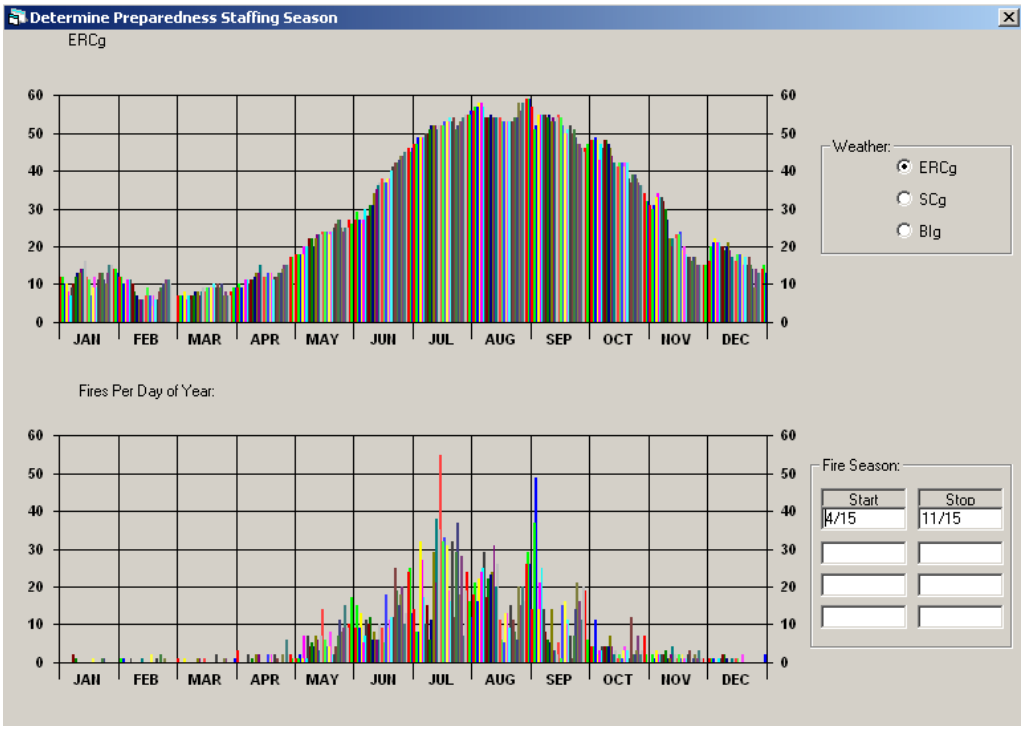
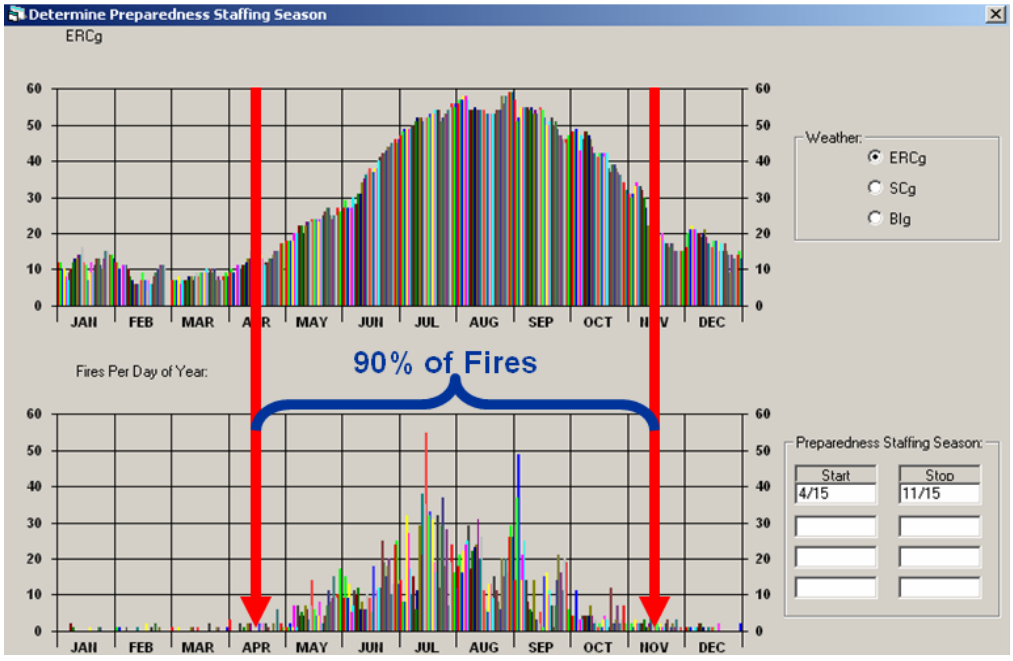


Figure 142



Prepare Historic-based Fire Event Scenario

Reserved for later use.

Prepare Probability-Based Fire Event Scenario

A probability-based fire event scenario is a collection of fires that represents one year of fire occurrence within an FPU. The fires are randomly created and attributed using probability matrices created from historic data. To perform this activity, click **FPA => Prepare Probability-based Fire Event Scenario.** The dialog in Figure 144 will appear. Click **OK** to proceed.

Figure 143

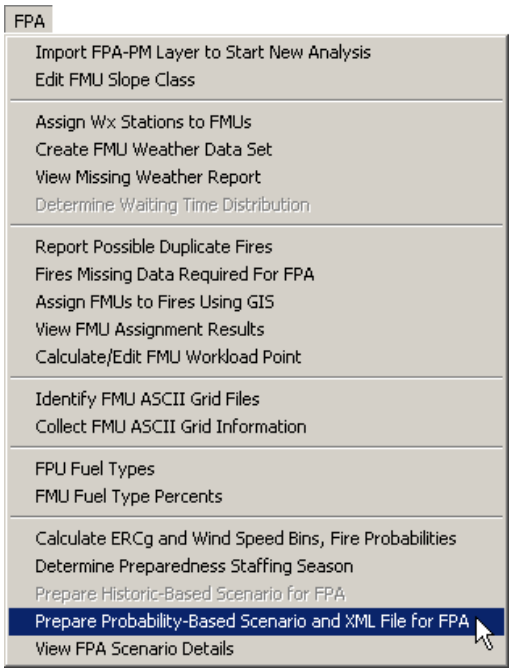
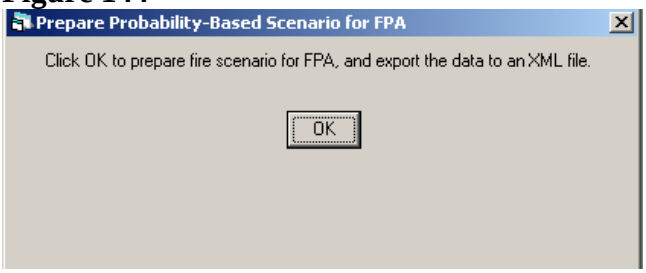
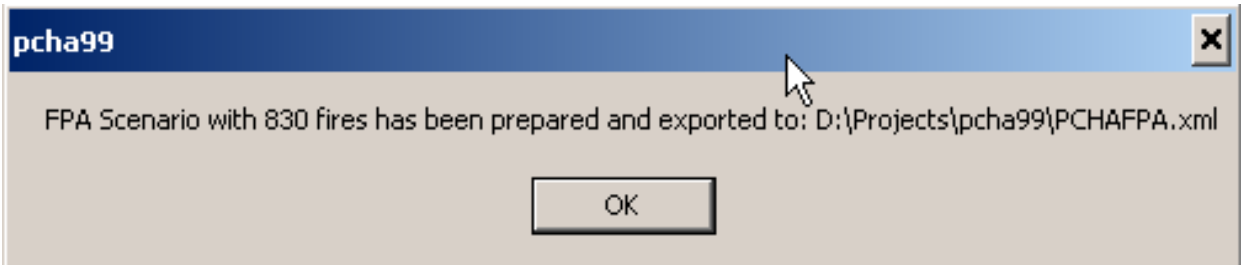


Figure 144



After **OK** is clicked in response to the prompt, PCHA will run for a while preparing the fire event scenario. When it is finished, it will automatically prepare the XML file (Figure 145). Click **OK** to complete the activity.

Figure 145



View FPA Scenario Details

The planner can now view a series of reports about the fire event scenario. The reports can be accessed using the FPA menu in PCHA. Select **FPA => View Scenario Details** and the dialog in Figure 1467 will appear.

Figure 146

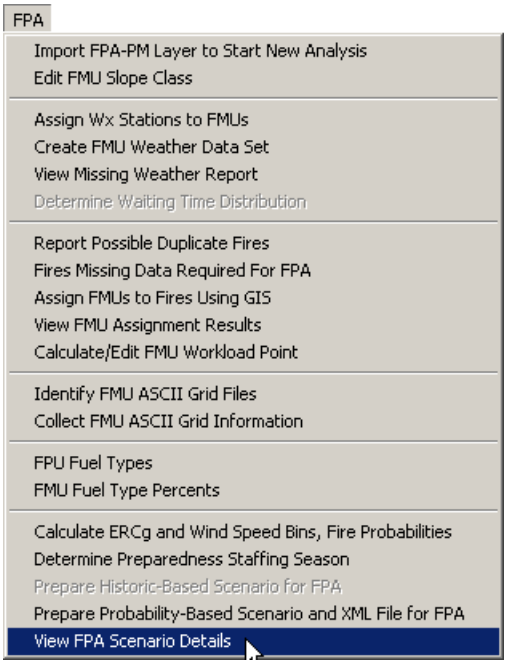
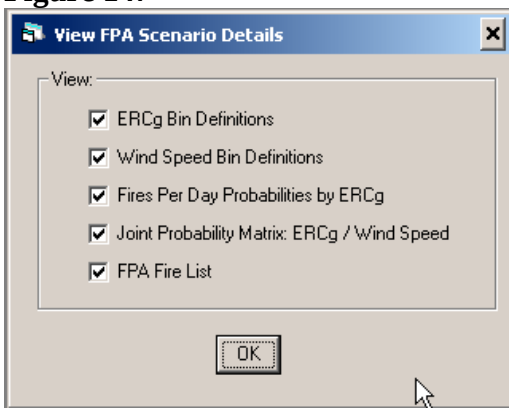


Figure 147

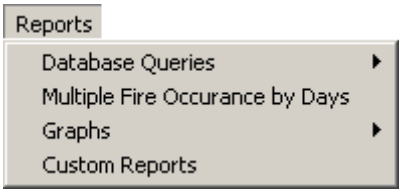


Select the reports that are desired for viewing.

The Reports Menu

PCHA can generate and print a variety of reports and graphs.

Figure 148 – The Reports Menu



Database Queries

Each of these reports allows the planner to enter the period of years for the data to be included in the report. The planner can customize the title of a report (Figure 151).

Figure 149 – The Database Queries Menu

Database Queries Reports Available

Figure 150 shows the reports available under the **Reports => Database Queries** menu item. To create a report, select the menu that is desired. Enter the beginning and ending years for the period that data is desired from and then click **OK**. Enter a title (Figure 151) and click **OK** to generate the report. To close the Report window, click on the **X** in the upper right corner of the display window.

Figure 150 – Database Queries Reports Available

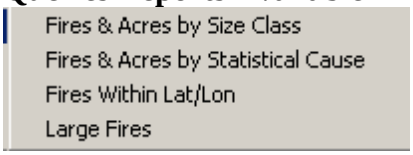
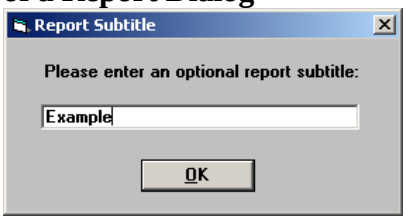


Figure 151 – Custom Naming of a Report Dialog



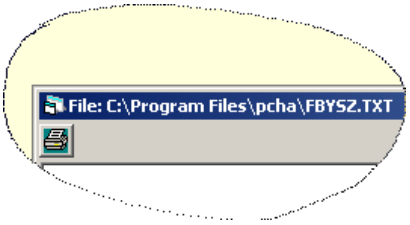
Printing a Report

When the report is displayed on the screen, click **Print** in the upper left corner to print the report.

Report Text Files

When PCHA creates a report, it saves that report as an ASCII text file in the folder where PCHA is installed. The path to the file and the file name appear at the top of the report display window (Figure 152). These report files can be viewed in any word processing program. Note that a Courier font must be used for this text. Assigning a proportional font to the text will cause the report to appear incorrectly.

Figure 152 – Location of Path and File Name



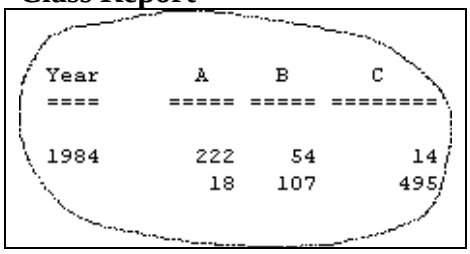
Description of Reports

A description of each report follows.

Fires and Acres by Size Class Report

PCHA will create a report named FBYSZ.TXT that lists the number of fires and acres burned by year and size class. The setup screen allows the planner to select any combination of fires by statistical cause. The top line of each pair shows the number of fires and the lower line shows acres burned (Figure 153). The setup screen allows the planner to select only lightning fires, only human caused fires, or any combination of fires by statistical cause.

Figure 153 – Example from the of Fires and Acres by Size Class Report



Year	A	B	C
1984	222	54	14
	18	107	495

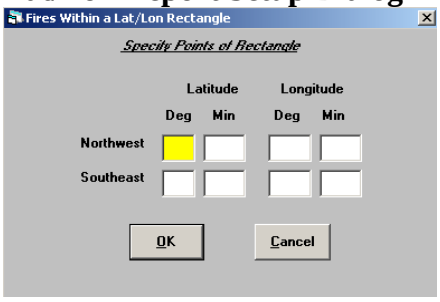
Fires and Acres by Statistical Cause Report

PCHA will create a report named FBYSTAT.TXT that shows the number of fires by statistical cause.

Fires Within Lat/Lon Report

PCHA will create a report named REPLL.TXT that lists fires within a rectangle defined by the planner. The planner will need to enter the latitude and longitude in degrees and minutes for the northwest and southeast corners (Figure 154). After entering the northwest and southeast coordinates, click **OK**. The report lists the boundaries entered as well as the discovery date, fire number, township, range, section, subsection, meridian, latitude, and longitude for each fire located within the rectangle defined.

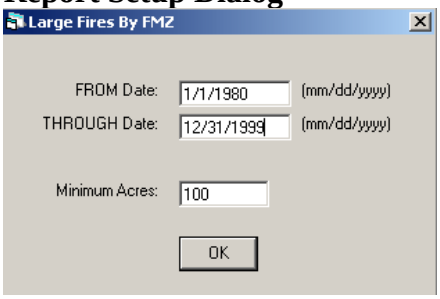
Figure 154 – The Fires Within Lat/Lon Report Setup Dialog



Large Fires Report

PCHA will create a report named LargeFires.TXT. This report lists all fires in the FPU during the time period specificed that had a final fire size greater than the one defined in the setup window (Figure 155).

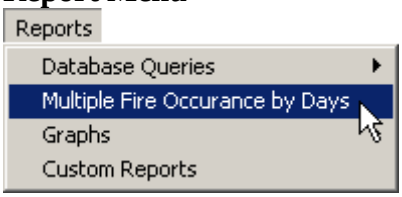
Figure 155 – The Large Fires Report Setup Dialog



Multiple Fire Occurrences by Days

This report lists the number of fires per day and the number of days that each fire occurrence situation occurred in the analysis period. For example, if the FPU had six fires, three of which occurred on a single day, and the other three were on different days, the report would show two lines: one line for 3 fire days with 1 fire per day, and 1 day with 3 fires per day. The report is titled MULTFIRE.DAT.

Figure 156 – The Multiple Fire Occurrences by Days Report Menu



Graphs

Two graphs are available. These are:

- Fires and Acres by FIL
- Multiple Fire Occurrences by Days

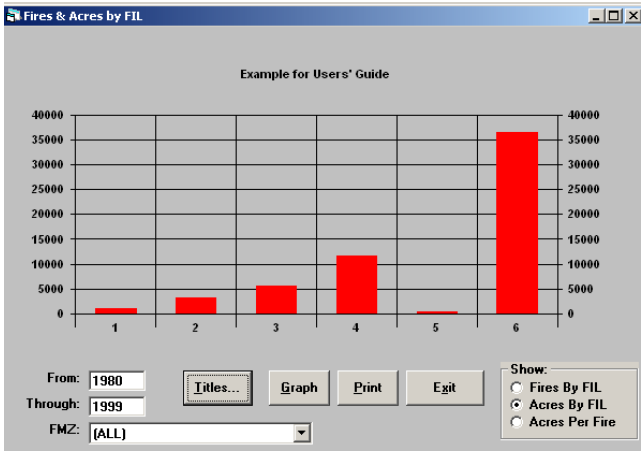
Figure 157 – The Graphs Menu

The screens for each graph allow the planner to choose the range of years to include, to define a major title and to print the graph.

Fires & Acres by FIL Graph

This menu item allows the planner to graph the number of fires or acres burned by Fire Intensity Level.

Figure 158 – The Graphs Menu



Step 1

Click on the radio button to select the graph type from the options given in the lower right corner.

Step 2

Enter the From and Through years.

Step 3

Use the pull-down to select the FMUs to use.

Step 4

Click **Graph** to display the graph.

Step 5

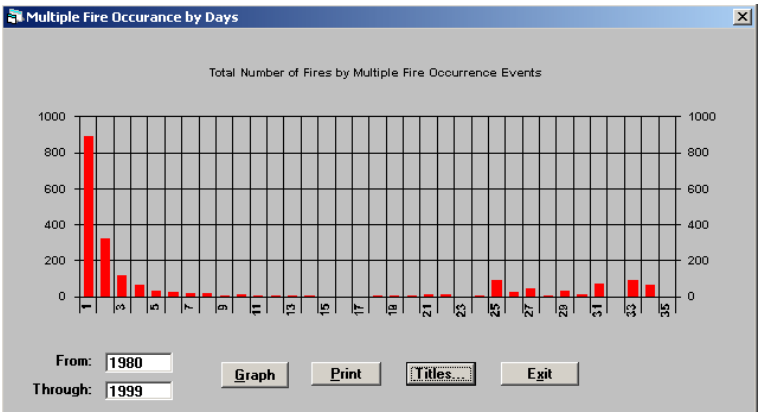
Click **Titles** to enter a unique major graph title, which appears at the top of the graph. In the example in Figure 158, this title has been entered as Example for Users' Guide.

Click **Print** to print the graph and click **Exit** to close the dialog screen.

Multiple Fire Occurrence by Days

This function allows the planner to graph the number of fire days by the number of fires discovered on that day. After generating the graph it can be printed by clicking **Print**. Clicking **Titles** and entering the preferred text can add subtitles.

Figure 159 – The Graphs Menu



Step 1

Enter the From and Through years.

Step 2

Click **Graph** to display the graph.

Step 3

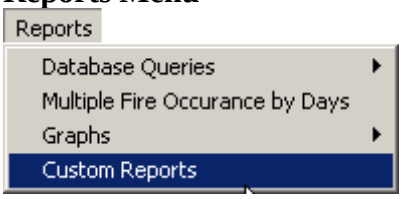
Click **Titles** to enter a unique major graph title, which appears at the top of the graph. In the example in Figure 159, this title has been entered as Total Number of Fires by Multiple Fire Occurrence Events.

Click **Print** to print the graph and click **Exit** to close the dialog box.

Custom Reports

Need to add info when I understand this process.

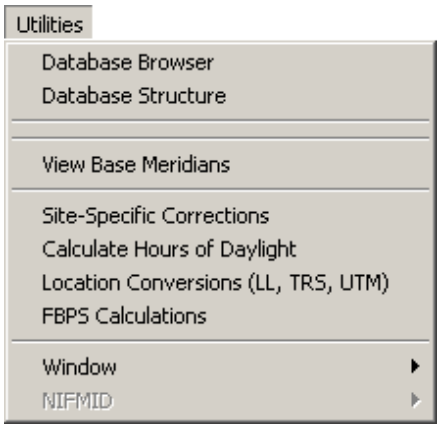
Figure 160 – The Custom Reports Menu



The Utilities Menu

The Utilities menu has many tools and aids to support work by the fire planner. The Utilities menu is shown in Figure 161.

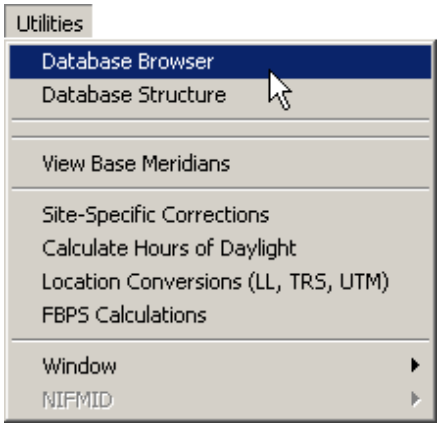
Figure 161 – The Utilities Menu



Database Browser

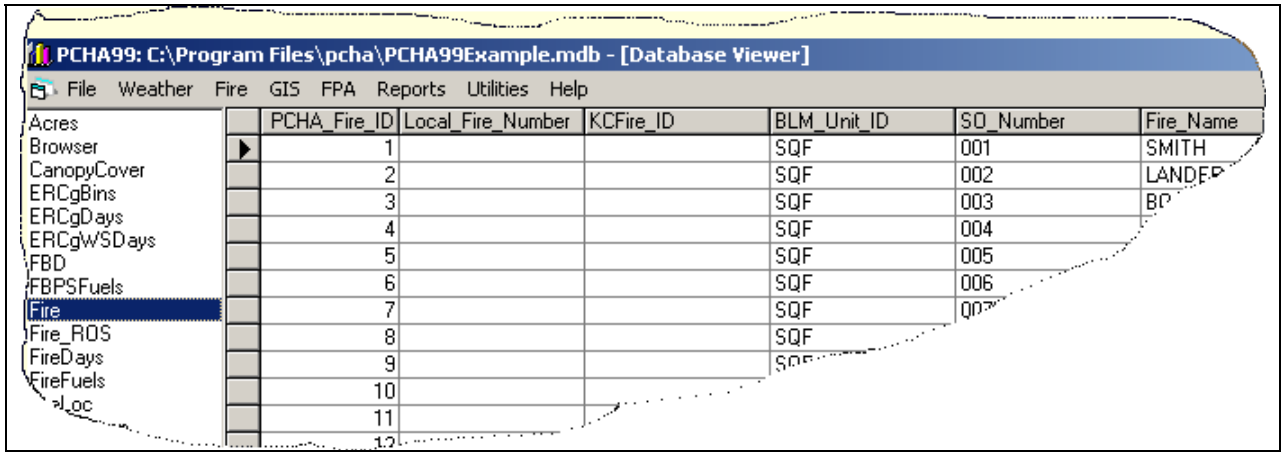
This menu allows the planner to view the information that is in the data tables in the PCHA database. An example of the Database Browser menu screen is shown in Figure 162.

Figure 162 – The Database Browser Menu



In the example in Figure 163, the Fire data table has been selected. To view any database table, click on the table name in the column on the left side of the screen. Click on the scroll bar along the bottom to move the viewing window right or left. To move up or down, use the scroll bar on the right side of the window. To exit the window, click **X** in the upper right corner of the window.

Figure 163 – Example of Database Browser Screen



This window allows the planner the opportunity to view but not change information contained in the data tables of the PCHA database. PCHA displays the internal representation of the data hence some of the entries may appear confusing. For example, township -3 means 3S. Values in the Herb_Annual field are 0 and –1, which are binary numerical representations for Yes and No.

Displays can be sorted by the value in a column. To do this, click on the column header. It will sort the complete set of records based in the values in the selected column. Clicking again will sort the records in the reverse order. It is not possible to drag and drop columns in the display.

Database Structure

This menu allows the planner to view the structure of the PCHA database. Selecting this menu will result in a report.

An excerpt of this report is shown in Figure 165. The report lists the tables in the database together with each field and that field's data type. To move up or down, use the scroll bar on the right side of the window. To exit the window, click **X** in the upper right corner of the window. The report is saved in the folder where PCHA is installed with a file name of DBSTRUCT.REP.

Figure 164 – The Database Structure Menu

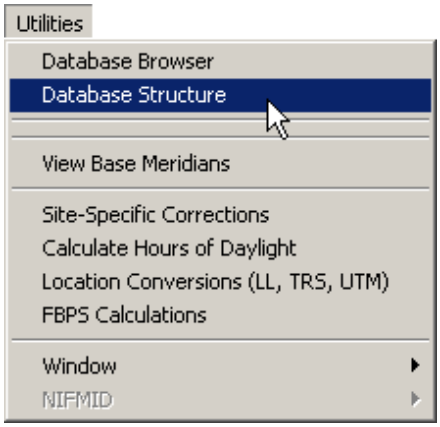
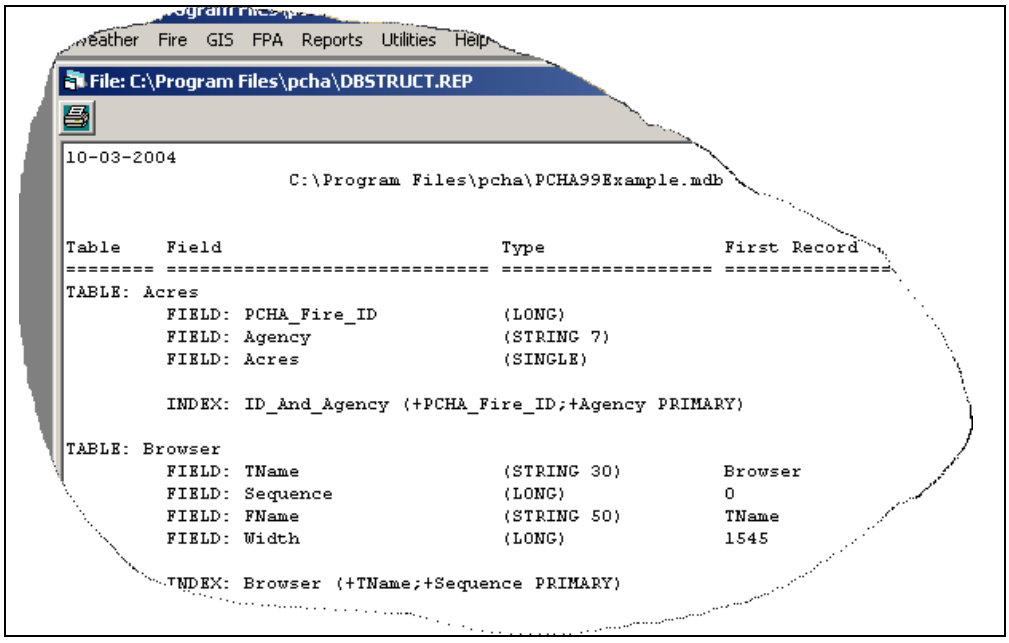


Figure 165 – Example of Database Structure Screen



View Base Meridians

This menu item allows the planner to view the codes for the principal meridian. Selecting this menu will yield a blank version of the dialog in Figure 167. Click **Search** to see the first principal meridian in the database. An explanation of each field and button follows.

Figure 166 – The View Base Meridians Menu

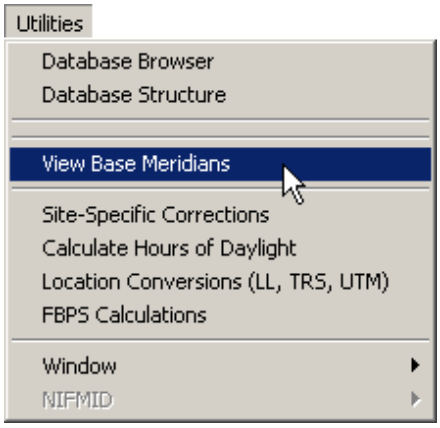
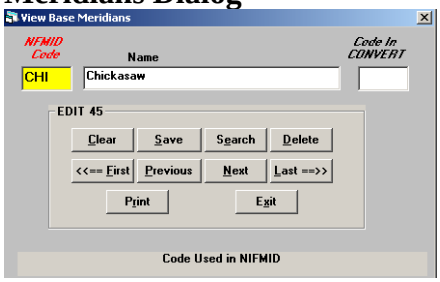


Figure 167 – The View Base Meridians Dialog



NIFMID Code

This is the alpha code used in NIFMID to identify the Principal Meridian. The Planner can search for records with this field. The principal meridian name will be displayed.

Code in CONVERT

The CONVERT program uses a different set of abbreviations to identify principal meridians. This field displays the code used in CONVERT.

Clear Button

The **Clear** button deletes entries in the screen boxes to facilitate the start of a new search.

Save Button

The **Save** button is academic as an edit cannot be saved. This is a view only screen.

Search Button

Press **Search** to find the first meridian record in the database. Once a record is displayed, the **First**, **Previous**, **Next**, and **Last** buttons can be used to move through the meridians.

Delete Button

The **Delete** button is academic, as an edit cannot be saved. This is a view only screen.

First, Previous, Next, and Last Buttons

The **First** button displays the first meridian record in the database. The **Previous** and **Next** buttons display the meridian record before or after the current meridian record. The **Last** button displays the last meridian record in the database. These buttons show light gray if there are no meridian records in the database.

Print Button

The **Print** button tells the computer to generate a page that looks like the meridian screen.

Exit Button

The **Exit** button closes the meridian entry screen and returns to the main PCHA screen.

Site-Specific Corrections

This function enables the planner to define various site-specific values that will then display additions or subtractions to fuel moisture values. The calculations are developed to make changes to the 1-h timelag fuel moisture at a weather observation site to a fire location site. The variables to be used include:

- The month of the year,
- The time of the day
- The elevation difference between the weather observation site and the fire location site
- The aspect at the fire location site
- The shading at the fire location site
- The slope at the fire location site

Figure 168 – The Site-Specific Corrections Menu

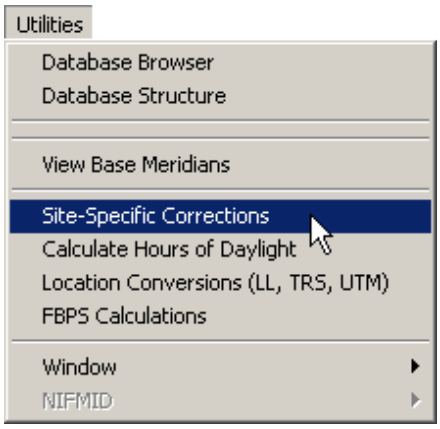
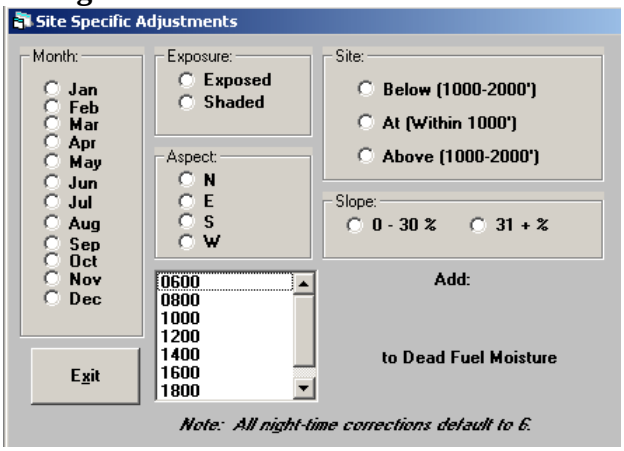


Figure 169 – The Site-Specific Corrections Dialog



This utility uses the same process that is used in PCHA to assign a 1-h timelag fuel moisture to a historic fire during the calculation that assigns a rate of spread and flame length to a historic fire.

Month

Click on the month. Note this sets the defaults as follows: Exposure defaults to Shaded, Site defaults to Below, Aspect defaults to North, Slope to 31+%, and Time to 0800. These defaults must be reset if other values are desired.

Shading

Choose unshaded for areas with 0-50% canopy cover/cloud cover and ushaded for areas with a canopy cover/cloud cover of 51-100%.

Aspect

Choose one of the four cardinal directions.

Time

Only daylight hours are included, in two-hour bands, since the calculations show only the effects of solar radiation on the fuels.

Site
Click on the choice that represents the difference in elevation between the weather observation site and the fire location site. Note that if this difference is greater than 2000 feet, it is advised that a correction be made. A new weather observation site needs to be established that is within 2000 feet of the fire location site.

Slope
Choose one of the slope options.

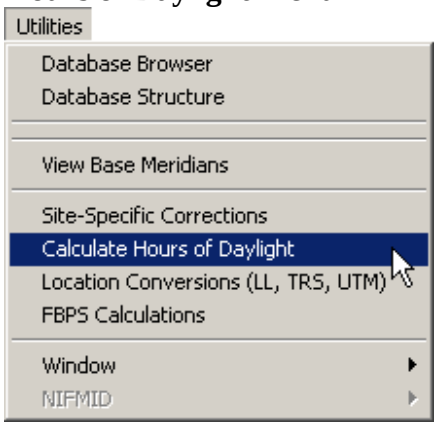
Add to Dead Fuel Moisture
The red value shows the increase (or decrease) in 1-h timelag fuel moisture value from the weather station's calculated 1-h timelag fuel moisture value.

Exit Button
The **Exit** button closes the site specific corrections entry screen and returns the user to the PCHA main menu.

Calculate Hours of Daylight

This routine displays the number of daylight hours per day for a given latitude and date. Enter the latitude in degrees, the date (mm/dd or mm/dd/yyyy are both acceptable), and then **Calculate**. The hours and minutes of daylight will appear.

Figure 170 – The Calculate Hours of Daylight Menu

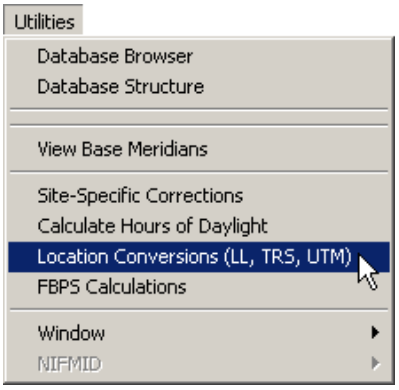


Location Conversion (LL, TRS, UTNM)

This utility converts any one of the following formats to the other three. The four formats are:

- Township, Range and Section (TRS)
- Latitude and Longitude in Decimal Format
- Latitude and Longitude in Degrees, Minutes and Seconds Format
- UTM

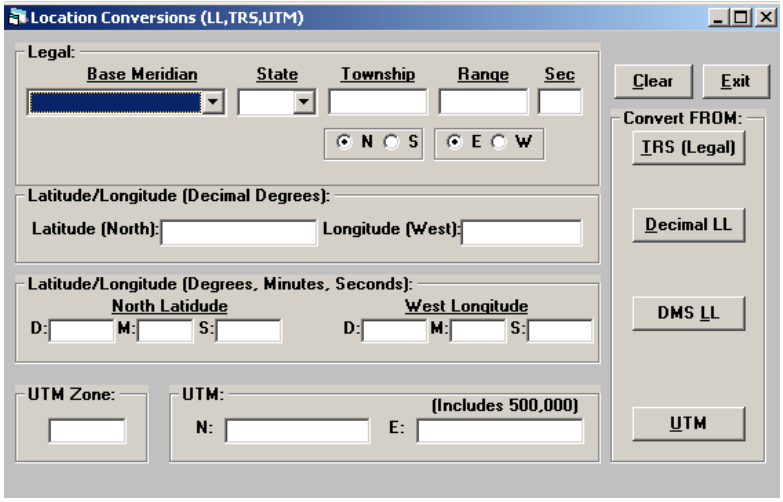
Figure 171 – The Location Conversion Menu



Step 1
Determine the location format that is to be converted.

Step 2:
Enter the required information for the location to be converted in the appropriate area.

Figure 172 – The Location Conversion Menu



Step 3
Click on the appropriate button in the Convert FROM section.

The location value will appear in the other three formats.

Thus utility uses the same equations that are used in the **Fire => Calculate Lat/Lon From Lega**l menu function. This menu facilitates the conversion of Township, Range, and Section to Latitude and Longitude.

FBPS Calculations

This utility uses the same equations that calculate rate of spread and flame length for a fire event. It is provided so that a planner can test the expected fire behavior in a fuel type under a defined set of weather and topographic conditions. Selecting **Utilities => FBPS Calculations** will yield the dialog shown in Figure 174. Below is a description of the inputs and outputs. In parenthesis following each is the range of acceptable values.

Figure 173 – The FBPS Calculations Menu

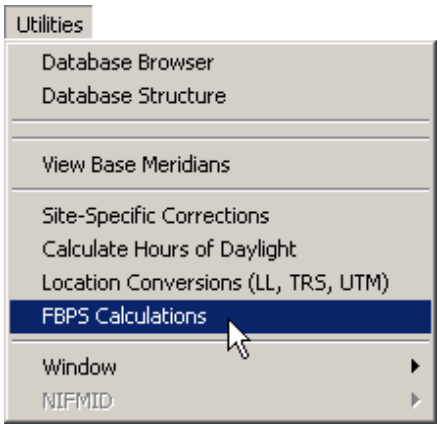
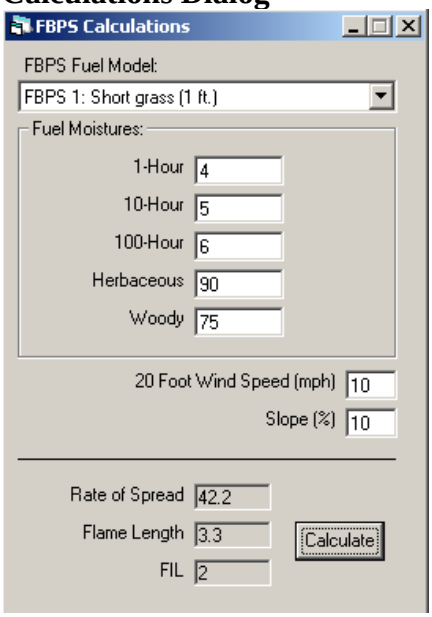


Figure 174 – The FBPS Calculations Dialog



FBPS Fuel Model (1-13)

Enter the number of the FBPS fuel model. Table 29 contains a listing of these fuel models.

Table 29 – FBPS Fuel Models

Fuel Group	FBPS Fuel Model
Grass	1 - Short Grass (1 foot)
	2 - Timber (Grass and understory)
	3 - Tall Grass (2.5 feet)
Brush	4 – Chaparral
	5 – Brush
	6 - Dormant Brush
	7 - Southern Rough
Timber Litter	8 - Closed Timber Litter
	9 - Hardwood (pine long needle litter)
	10 - Timber
Slash	11 - Light Slash
	12 - Medium Slash
	13 - Heavy Slash

1-h Fuel Moisture (1-60%)

The 1-hour timelag reference fuel moisture can be estimated using the air temperature and the relative humidity.

10-h Fuel Moisture (1-60%)

It is suggest the 10-h fuel moisture be set as 1% more than the 1-h fuel moisture.

100-h Fuel Moisture (1-60%)

It is suggest the 100-h fuel moisture be set as 2% more than the 1-h fuel moisture.

Herb Fuel Moisture (30-300%)
Enter the moisture content of the grass and forb fuels. See Table 30 for estimates of this value.

Table 30 – Guidelines for Live Fuel Moisture	
State of Vegetation Development	**Moisture Content**
Fresh foliage, annual developing, early in growing cycle	300%
Mature foliage, still maturing with full turgor	200%
Mature foliage, new growth complete and comparable to older perennial foliage	100%
Entering dormancy, coloration started, some leaves may have dropped from stem	50%
Cured	30%

Shrub Fuel Moisture (30-300%)
Enter the moisture content of the shrubs fuels.

Foliage Moisture Content (30-200%)
The foliar moisture content is the percent of moisture in the foliage, needles and leaves. In PCHA, this value is held constant at 100% since there are no reliable methods to use current fuels and weather inputs to model its change throughout the year.

20-ft. Wind Speed (0-99mph)
The wind speed is frequently taken at a National Fire Danger Rating System weather station. The National Fire Weathers Observers Handbook provides the standards for the gathering of weather at stations designated to provide data for the National Fire Danger Rating System (Deeming et. al, 1972). The wind speed measurement is taken at 20 feet above the vegetation and is measured based on a 10-minute average. The wind speed values used should be the average expected values for the projection period. Enter the 20-foot wind speed in the cell.

Canopy Base Height (1-299 feet)
For an individual tree, the measurement of the height to the base of the crown can be made. The averaging of these values for all trees in a stand would give an estimate of the level of the stand canopy base height. Frequently, this is a measure of the point where the limbs of the canopy start vertically but the number can be skewed by the presence of small trees or occasional live limbs. A more meaningful value would be the height above the ground of the first canopy layer where the density of the crown mass within the layer is high enough to support vertical movement of a fire.

Canopy Bulk Density (kg/m3)
Mathematically, canopy bulk density (CBD) (kg/m^3) is canopy biomass divided by the volume occupied by crown fuels. Canopy bulk density is hard to estimate in the field. Initially, it seems attractive to calculate this value by treating the canopy as a box with the depth the stand height minus the canopy base height. Assuming this box covered an acre (43,560 ft^2), dividing the fuel loading in the canopy by the volume of box would provide an estimate of average canopy bulk density. Unfortunately, this estimate has a bias toward underestimation of the canopy bulk density due to the averaging of largely void areas in the top and bottom of the canopy with the more dense layers of foliage. A fire burning vertically within the crowns will most likely propagate through denser canopy layers.

Stand Height (5-300 feet)
For an individual tree, the measurement of the tree height made. The averaging of these values for all trees in a stand would give an estimate of the stand height.

Canopy Cover Percentage (0-100%)
Canopy cover is normally measured as a percent. It is based on the lineal length that is within a canopy versus in the open. Frequently, canopy cover values are defined via the categories shown in Table 31.

Table 31 – Definition of Canopy Cover Categories

Category	Range	Used in Calculations
0	0%	0%
1	1 – 20%	10%
2	21–50%	35%
3	51-80%	65%
4	81-100%	90%

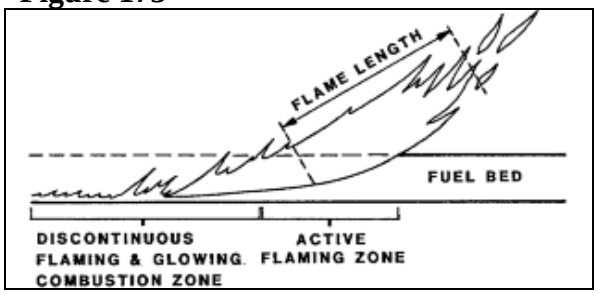
Slope (0-100%)
The slope steepness is expressed in percent and equal to the number of feet of elevation change per 100 feet of horizontal distance. The value is the steepness of the slope "straight uphill."

Midflame Wind Speed
The midflame wind speed is the wind speed that exists at midflame height above the fuel bed. Midflame is often called eye-level. Technically, midflame wind speed is the average wind speed measured from the top of the fuel bed to the height of the flame above the fuel (Albini and Baughman 1979).

Surface Rate of Spread (ch/hr)
Rate of spread is the "speed" the fire travels through the surface fuels. The rate of spread is the spread rate of the head fire spreading uphill with the wind blowing straight uphill. The rate of spread prediction uses the Rothermel (1972) surface fire spread model, which assumes the weather, topography and fuels remain uniform for the elapsed time of the projection.

Surface Flame Length (feet)

Figure 175



This is the length of the flame in a spreading surface fire within the flaming front. Flame length is measured from midway in the combustion zone to the average tip of the flames. "Flame length is an elusive parameter that exists in the eye of the beholder. It is a poor quantity to use in a scientific or engineering sense, but it is so readily apparent to fireline personnel and so readily conveys a sense of fire intensity that it is worth featuring as a primary fire variable." (Rothermel 1991)

Fire Type

There as three types of fires predicted.

- Surface Fire
- Passive Crown Fire
- Active Crown Fire

Surface Fire

A surface fire is one that burns only in the surface fuelbed.

Passive Crown Fire

A passive crown fire is traditionally called "torching." It is small scale, consuming single or small groups of trees or bushes. This stage of a crown fire reinforces the spread of the fire, but the main fire spread is still dependent upon surface fire behavior.

Active Crown Fire

An active crown fire is associated with a "pulsing" spread. The surface fire ignites crowns and the fire spread is able to propagate through the canopy. After a distance, the crown fire weakens due to a lack of reinforcing surface fire heat. When the surface fire catches up to where the crown fire died, the surface fire intensity again initiates a crown fire "pulse."

Resultant Rate of Spread

This is the final calculated fire spread rate. If the fire type is passive then the estimated fire spread rate is the same as the surface fire behavior rate of spread. If the fire type is active, then this value is calculated as the crown rate of spread (Rothermel 1991). If the fire type is passive, then this value is scaled between the surface fire spread rate when passive crown starts and the maximum crown rate of spread based on the crown fraction burned (Scott and Reinhart 2000).

Resultant Flame Length (feet)
This is the length of the flame based fire intensity. This intensity is calculated based on the fuel consumption in the surface and aerial (canopy) fuels. The resultant flame length for a surface fire type is the same as surface flame length. For a passive or active crown fire, the resultant flame length will be longer due to the consumption of canopy fuels in addition to the surface fuels.

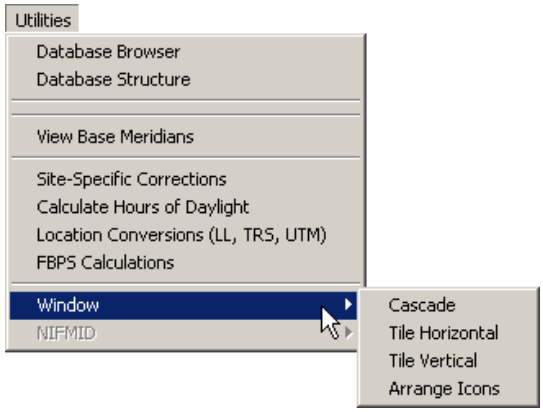
Fire Intensity Level
For FPA, the Fire Intensity Level (FIL) is defined using the flame length. Table 32 lists the correlations between FIL and flame length. In FPA, fire effects are defined by FIL.

Table 32

Fire Intensity Level	Flame Length
1	0 – 2.0 feet
2	2.1 – 4.0 feet
3	4.1 – 6.0 feet
4	6.1 – 8.0 feet
5	8.1 – 12.0 feet
6	12.1+ feet

Window
In PCHA, the user can have multiple windows open at the same time. These commands allow the user to rearrange these windows. The choices include tiling or cascading the windows as well as aligning the icons of minimized windows.

Figure 176 – The Window Menu



Cascade
This option tells PCHA to stack multiple windows one atop another if it is beneficial to have more than one window open at a time.

Tile Horizontal
With the horizontal tile option, PCHA attempts to place windows side by side. This can be useful as it allows the user to see information from different screens at the same time. The windows tend to be tall and skinny.

Tile Vertical
Tile vertical puts multiple windows one above another. The windows are short and wide. This option works for some windows and is impossible to read for others.

Arrange Icons
If the user has multiple windows open but minimized, the icons for each minimized window are arranged along the bottom of the screen.

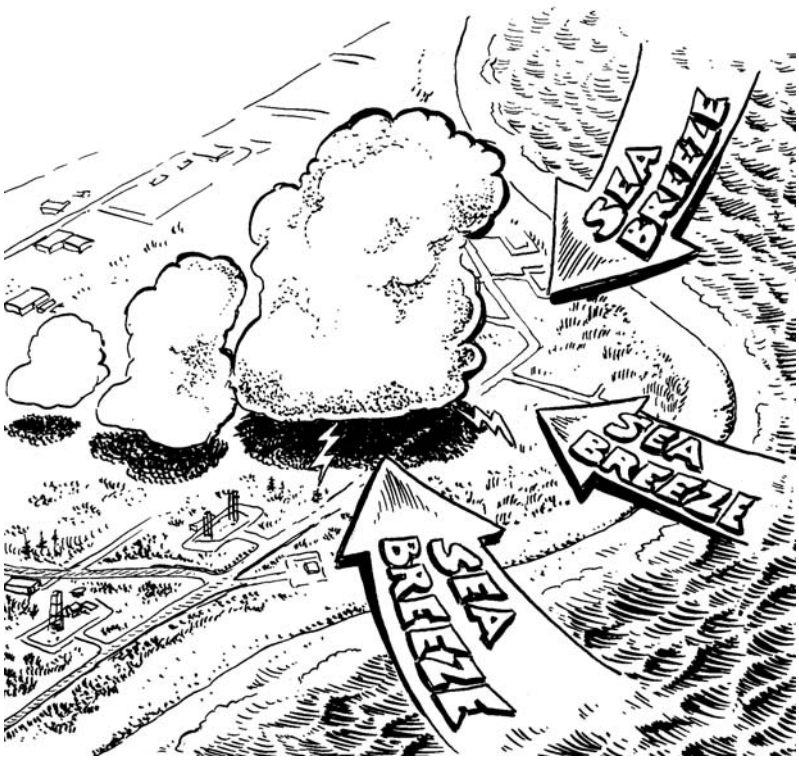
NIFMID
Reserved for later use.

The Help Menu

Figure 177 – The Help Menu

Contents
Reserved for later use.

About
This screen displays the version and release date of the software.


SEA BREEZE
SEA BREEZE
SEA BREEZE

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Appendix A

Forest Service PCHA Report Format

Forest Service PCHA Report Format

File names look like (PCHArrff.RAW) where rrff are the FS region and forest identified on the Planning Unit Setup screen. The file extension must be RAW.

Table 30

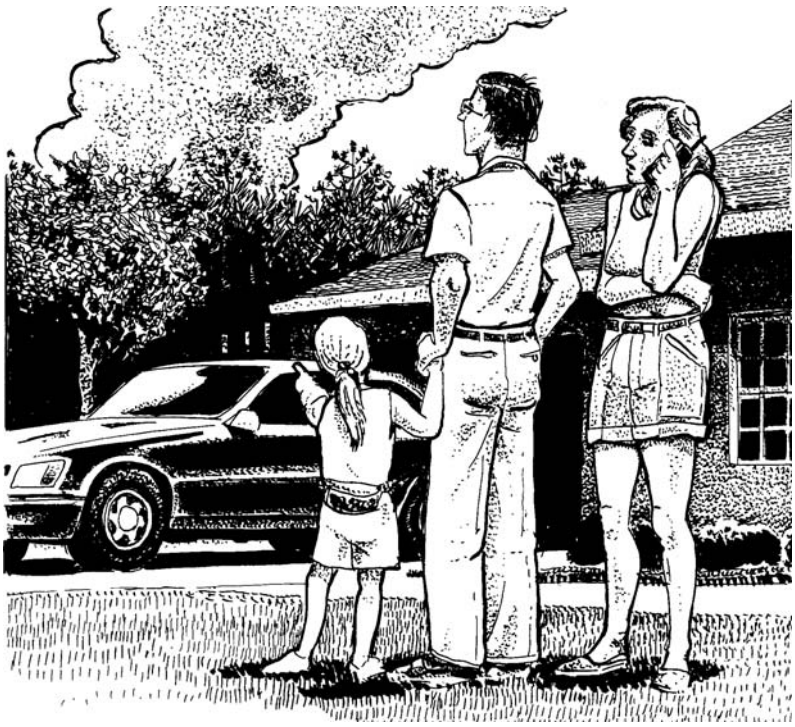
Item No.	Field Name	Field Width	Example
1	Reporting FS Region	1-2	5
2	Reporting FS Unit	3-4	16
3	Fire Number	5-7	23
4	District	8-9	52
5	Statistical Cause	10	1
6	General Cause	11	0
7	Specific Cause	12-13	1
8	Class of People	14	0
9	Fire Size Class	15	B
10	Total Acres Burned	16-24	0.3
11	FS Area Burned	25-33	0.2
12	Non-FS, FS Prot Acres Burned	34-42	0.1
13	Non-FS Acres Burned	43-51	0
14	Vegetation Cover Type	52-53	
15	NFMAS Aspect	54	
16	Topography Code	55	
17	Fire Management Zone (60 usually blank)	56-60	
18	Weather Station	61-66	41523
19	NFDRS Fuel Model	67	G
20	Fire Intensity Level (FIL)	68	2
21	Fire Intensity Source	69-70	FR
22	Latitude (DDMMSS)	71-76	360200
23	Longitude (DDMMSS)	77-83	1190612
24	Township	84-88	
25	Range	89-93	
26	Section	94-95	
27	Subsection	96-99	
28	Principal Meridian	100-101	
29	Slope Percent	102-104	

Table 30

Item No.	Field Name	Field Width	Example
30	Aspect Code	105	
31	Elevation	106-110	
32	State	111-112	CA
33	County	113-115	
34	Protection Agency	116-118	
35	Ownership at Origin	119	
36	Prescribed Fire	120	Y/N
37	Escaped Fire	121	Y/N
38	Initial Suppression Strategy	122	
39	Fire Cost in Dollars	123-131	
40	Ignition Date	132-139	
41	Ignition Time	140-143	
42	Discovery Date	144-151	19900714
43	Discovery Time	152-155	
44	First Action Date	156-163	
45	First Action Time	164-167	
46	Second Action Date	168-175	
47	Second Action Time	176-179	
48	Declared Wildfire Date	180-187	
49	Declared Wildfire Time	188-191	
50	Fire Contained Date	192-199	
51	Fire Contained Time	200-203	
52	Fire Controlled Date	204-211	
53	Fire Controlled Time	212-215	
54	Fire Out Date	216-223	
55	Fire Out Time	224-227	
56	Fire Name	228-247	Lost Loop
57	Fire ID	248-254	
58	Fire Account (PCode)	255-259	
59	Wilderness	260-262	

Appendix B

Department of Interior DI-1202 Format



File names on the FAMWEB site look like flnfmas2!rrff!1950!2002.raw. where rrff are the FS region and forest identified on the Planning Unit Setup screen. The file extension must be RAW.

Table 31 – DI-1202 Fire Record Format

Item No.	Item	Width	Start Col.	Stop Col.	Number of Decimals	Type
1	UNIT ID	8	1	8		CHARACTER
2	CALENDAR YEAR	4	10	13		NUMERIC
3	FIRE NUMBER	4	15	18		CHARACTER
4	FIRE TYPE	2	20	21		NUMERIC
5	GENERAL CAUSE	1	23	23		NUMERIC
6	SPECIFIC CAUSE	2	25	26		NUMERIC
7	PEOPLE	1	28	28		CHARACTER
8	NET CHANGE	8	30	37		CHARACTER
9	FIRE NAME	10	39	48		CHARACTER
10	AREA NAME	4	50	53		CHARACTER
11	LATITUDE	6	55	60		NUMERIC
12	LONGITUDE	7	62	68		NUMERIC
13	COST CODE	1	70	70		NUMERIC
14	OWNER	1	72	72		NUMERIC
15	FISCAL YEAR	2	74	75		NUMERIC
16	AGENCY FISCAL DATA 1	11	77	87		NUMERIC
17	AGENCY FISCAL DATA 2	11	89	99		NUMERIC
18	PROBLEM CLASS	1	101	101		CHARACTER
19	TOWNSHIP	4	103	106		CHARACTER
20	RANGE	4	108	111		CHARACTER
21	SECTION	2	113	114		CHARACTER
22	MERIDIAN	2	116	117		CHARACTER
23	UTM ZONE	2	119	120		CHARACTER
24	UTM EASTERN	6	122	127	2	NUMERIC
25	UTM NORTHERN	7	129	135	2	NUMERIC
26	DATE DISCOVERED	6	137	142		NUMERIC
27	TIME DISCOVERED	4	144	147		NUMERIC
28	TYPE DISCOVERED	1	149	149		CHARACTER
29	ACRES DISCOVERED	7	151	157	1	NUMERIC
30	DATE INIT ATTACK	6	159	164		NUMERIC
31	TIME INIT ATTACK	4	166	169		NUMERIC
32	TYPE INIT ATTACK 1	1	171	171		CHARACTER
33	TYPE INIT ATTACK 2	1	173	173		CHARACTER

Table 31 – DI-1202 Fire Record Format

Item No.	Item	Width	Start Col.	Stop Col.	Number of Decimals	Type
34	TYPE INIT ATTACK 3	1	175	175		CHARACTER
35	TYPE INIT ATTACK 4	1	177	177		CHARACTER
36	TYPE INIT ATTACK 5	1	179	179		CHARACTER
37	AMOUNT INIT ATTACK 1	2	181	182		NUMERIC
38	AMOUNT INIT ATTACK 2	2	184	185		NUMERIC
39	AMOUNT INIT ATTACK 3	2	187	188		NUMERIC
40	AMOUNT INIT ATTACK 4	2	190	191		NUMERIC
41	AMOUNT INIT ATTACK 5	2	193	194		NUMERIC
42	ACRES INIT ATTACK	7	196	202	1	NUMERIC
43	DATE CONTROLLED	6	204	209		NUMERIC
44	TIME CONTROLLED	4	211	214		NUMERIC
45	ACRES CONTROLLED	7	216	222	1	NUMERIC
46	DATE DECLARED OUT	6	224	229		NUMERIC
47	TOPOGRAPHY	1	231	231		NUMERIC
48	ASPECT	1	233	233		CHARACTER
49	SLOPE	1	235	235		NUMERIC
50	ELEVATION	1	237	237		CHARACTER
51	NFDRS STATION	6	239	244		NUMERIC
52	NFDRS FUEL STATION	4	246	249		CHARACTER
53	BEHAVIOR	1	251	251		NUMERIC
54	BURN INDEX	3	253	255		NUMERIC
55	ADJ CLASS	1	257	257		NUMERIC
56	RVC	1	259	259		CHARACTER
57	FORM OF HEAT	2	261	262		CHARACTER
58	CERTAINTY	1	264	264		NUMERIC
59	EQUIPMENT INVOLVED	3	266	268		NUMERIC
60	MATERIAL INVOLVED	2	270	271		CHARACTER
61	IGNITION FACTOR	2	273	274		CHARACTER
62	CLASS PEOPLE	1	276	276		CHARACTER
63	AGE	1	278	278		CHARACTER
64	SEX	1	280	280		CHARACTER
65	ACTIVITY INVOLVED	2	282	283		CHARACTER
66	ESTIMATED DAMAGE	7	285	291		NUMERIC
67	STATE	2	293	294		CHARACTER
68	LAND OWNER	1	296	296		NUMERIC
69	REF FIRE NBR	4	298	301		CHARACTER

Table 31 – DI-1202 Fire Record Format

Item No.	Item	Width	Start Col.	Stop Col.	Number of Decimals	Type
70	VEG. TYPE	1	303	303		NUMERIC
71	ACRES	7	305	311	1	NUMERIC
72	STATE	2	313	314		CHARACTER
73	LAND OWNER	1	316	316		NUMERIC
74	REF FIRE NBR	4	318	321		CHARACTER
75	VEG. TYPE	1	323	323		NUMERIC
76	ACRES	7	325	331	1	NUMERIC
77	STATE	2	333	334		CHARACTER
78	LAND OWNER	1	336	336		NUMERIC
79	REF FIRE NBR	4	338	341		CHARACTER
80	VEG. TYPE	1	343	343		NUMERIC
81	ACRES	7	345	351	1	NUMERIC
82	STATE	2	353	354		CHARACTER
83	LAND OWNER	1	356	356		NUMERIC
84	REF FIRE NBR	4	358	361		CHARACTER
85	VEG. TYPE	1	363	363		NUMERIC
86	ACRES	7	365	371	1	NUMERIC
87	STATE	2	373	374		CHARACTER
88	LAND OWNER	1	376	376		NUMERIC
89	REF FIRE NBR	4	378	381		CHARACTER
90	VEG. TYPE	1	383	383		NUMERIC
91	ACRES	7	385	391	1	NUMERIC
92	STATE	2	393	394		CHARACTER
93	LAND OWNER	1	396	396		NUMERIC
94	REF FIRE NBR	4	398	401		CHARACTER
95	VEG. TYPE	1	403	403		NUMERIC
96	ACRES	7	405	411	1	NUMERIC
97	STATE	2	413	414		CHARACTER
98	LAND OWNER	1	416	416		NUMERIC
99	REF FIRE NBR	4	418	421		CHARACTER
100	VEG. TYPE	1	423	423		NUMERIC
101	ACRES	7	425	431	1	NUMERIC
102	STATE	2	433	434		CHARACTER
103	LAND OWNER	1	436	436		NUMERIC
104	REF FIRE NBR	4	438	441		CHARACTER
105	VEG. TYPE	1	443	443		NUMERIC

Table 31 – DI-1202 Fire Record Format

Item No.	Item	Width	Start Col.	Stop Col.	Number of Decimals	Type
106	ACRES	7	445	451	1	NUMERIC
107	UNIT NUMBERS	2	453	454		CHARACTER
108	PLOT NUMBER	2	456	457		CHARACTER
109	PLOT OBJECTIVE	2	459	460		NUMERIC
110	FIRING STRATEGY	1	462	462		NUMERIC
111	FIRING METHOD	1	464	464		NUMERIC
112	COST PER ACRE	4	466	469	2	NUMERIC
113	NFFL FUEL MODEL	2	471	472		NUMERIC
114	TEMP MAX	3	474	476		NUMERIC
115	TEMP MIN	2	478	479		NUMERIC
116	REL. HUMIDITY MAX	2	481	482		
117	REL. HUMIDITY MIN	2	484	485	NUM	ERIC
118	WIND MAX	2	487	488		NUMERIC
119	WIND MIN	2	490	491		NUMERIC
120	FLAME MAX	3	493	495		NUMERIC
121	FLAME MIN	2	497	498		NUMERIC
122	ROS MAX	3	500	502		NUMERIC
123	ROS MIN	2	504	505		NUMERIC
124	NFFL FUEL MODEL	2	507	508		NUMERIC
125	TEMP MAX	3	510	512		NUMERIC
126	TEMP MIN	2	514	515		NUMERIC
127	REL. HUMIDITY MAX	2	517	518		NUMERIC
128	REL. HUMIDITY MIN	2	520	521		NUMERIC
129	WIND MAX	2	523	524		NUMERIC
130	WIND MIN	2	526	527		NUMERIC
131	FLAME MAX	3	529	531		NUMERIC
132	FLAME MIN	2	533	534		NUMERIC
133	ROS MAX	3	536	538		NUMERIC
134	ROS MIN	2	540	541		NUMERIC
135	PREBURN TONS/ACRE	3	543	545	1	NUMERIC
136	CONSUMPTION %	3	547	549		NUMERIC
137	PREBURN TONS/ACRE	3	551	553	1	NUMERIC
138	CONSUMPTION %	3	555	557		NUMERIC
139	PREBURN TONS/ACRE	3	559	561	1	NUMERIC
140	CONSUMPTION %	3	563	565		NUMERIC
141	PREBURN TONS/ACRE	3	567	569	1	NUMERIC

Table 31 – DI-1202 Fire Record Format

Item No.	Item	Width	Start Col.	Stop Col.	Number of Decimals	Type
142	CONSUMPTION %	3	571	573		NUMERIC
143	PREBURN TONS/ACRE	3	575	577	1	NUMERIC
144	CONSUMPTION %	3	579	581		NUMERIC
145	PREBURN TONS/ACRE	3	583	585	1	NUMERIC
146	CONSUMPTION %	3	587	589		NUMERIC
147	FIRE ESCAPE		591	590	1	CHARACTER
148	ESCAPE FIRE NUMBER	3	592	594	1	CHARACTER
149	DAY OF WEEK STARTED	1	596	596		CHARACTER
150	WAS FIRE INVESTIGATED	1	598	598		CHARACTER
151	WAS SUSPECT KNOWN	1	600	600		CHARACTER
152	TYPE OF SUSPECT	1	602	602		CHARACTER
153	REF PROJECT NUMBER	6	604	609		CHARACTER
154	PNF COMPLEX ESCAPE	1	611	611		CHARACTER
155	PNF COMPLEX VALUES	1	613	613		CHARACTER
156	PNF COMPLEX FUELS	1	615	615		CHARACTER
157	PNF COMPLEX DURATION	1	617	617		CHARACTER
158	PNF COMPLEX AIR QUALITY	1	619	619		CHARACTER
159	SUBMITTED NAME	30	621	650		CHARACTER
160	SUBMITTED TITLE	30	652	681		CHARACTER
161	SUBMITTED DATE	6	683	688		NUMERIC
162	APPROVED NAME	30	690	719		CHARACTER
163	APPROVED TITLE	30	721	750		CHARACTER
164	APPROVED DATE	6	752	757		NUMERIC


FIRE
CONTROL

Appendix C

Weather .fwx File Format

This file is also known as a "short obs" file. Weather observations must use the naming convention (WXnnnnnn.FWX) where nnnnnn is the weather station number. The prefix letters WX are optional. The file extension must be FWX.

Table 32 – Weather fwx File Format

Item No.	Item	Column Width
1	Weather Station Number	1-6
2	Observation Date (YYMMDD)	7-12
3	State of Weather Code	13
4	Dry Bulb Temperature	14-16
5	Relative Humidity (Percent)	17-19
6	blank	20-22
7	Herbaceous Vegetation Condition	23-24
8	Human-caused Risk	25-27
9	Wind Direction	28
10	Wind speed (mph)	29-31
11	blank	32
12	10-Hour timelag fuel moisture	33-35
13	blank	36-38
14	Maximum temperature (ºF)	39-41
15	Minimum temperature (ºF)	42-44
16	Maximum relative humidity (percent)	45-47
17	Minimum relative humidity (percent)	48-50
18	blank	51
19	Precipitation duration (hours)	52-53
20	Precipitation amount (inches nn.nn)	54-57
21	Lightning Activity Level	58-60
22	RH indicator (2)	61
23	blank	62-80

Appendix D

Weather Observation Data Transfer Format 1998 (.fw9)

Weather Observation Data Transfer Format 1998 (.fw9)

New data format adopted in May of 1998 intended to replace the Short weather observation file format.(.FWX). This format attempts to meet current and future needs and to remedy the shortcomings of the 1972 format.

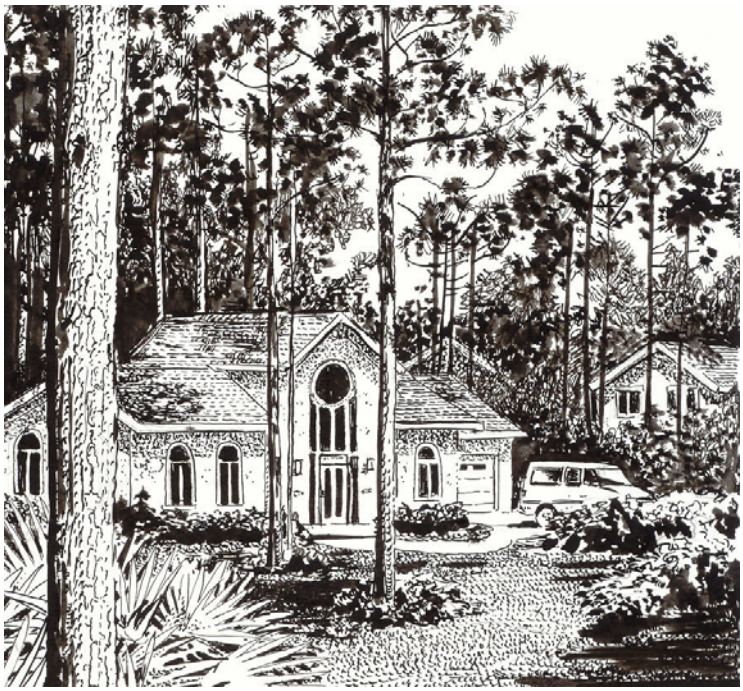
Table 33 – Weather .fw9 File Format

Item No.	Item	Column Width
1	Record type (W98). All records begin with this record type identifier code	01-03
2	Station Number	04-09
3	Observation date (YYYYMMDD)	10-17
4	Observation time (0000-2359)	18-21
5	Observation type (O=NFDRS, R=Raws other than at the standard NFDRS observation time, F=Forecast, X=Other)	22
6	State of weather code	23
7	Dry bulb temperature (degrees Fahrenheit or degrees Celsius based on Measurement Type code	24-26
8	Atmospheric moisture (wet bulb temperature, relative humidity (percent), or dew point temperature based on Moisture Type code	27-29
9	Wind direction azimuth measured from true north; 0 (zero) means no wind direction, 360 is north	30-32
10	Average wind speed over a ten-minute period (miles or kilometers per hour based on Measurement Type code	33-35
11	Measured 10-hour time lag fuel moisture	36-37
12	Maximum Temperature (degrees Fahrenheit or degrees Celsius base on Measurement Type code	38-40
13	Minimum Temperature (degrees Fahrenheit or degrees Celsius base on Measurement Type code	41-43
14	Maximum relative humidity (percent)	44-46
15	Minimum relative humidity (percent)	47-49
16	Precipitation duration (hours)	50-51
17	Precipitation amount based on Measurement Type code [col. 63]. Blanks=no precipitation. US measurement: inches with implied decimal nn.nnn format; trace shown as 00005. Metric measurement: in millimeters, no implied decimal; trace shown as 00001	52-56
18	Wet flag (Y/N)	57
19	Herbaceous greenness factor (0-20)	58-59
20	Shrub greenness factor (0-20)	60-61

Table 33 – Weather .fw9 File Format		
Item No.	**Item**	**Column Width**
21	Moisture Type code (1=Wet Bulb, 2=Relative humidity,3=Dew point)	62
22	Measurement Type code (1=U.S., 2=Metric, Affects temperature (Fahrenheit or Celsius), wind (miles or kilometers per hour), and precipitation (decimal inches or millimeters))	63
23	Season code (1=Winter, 2=Spring, 3=Summer, 4=Fall)	64
24	Solar radiation (watts per square meter)	65-68

Appendix E

GIS Formats



GIS 1

The format for the GIS 1 file is in Table 34.

Table 34			
Item No.	**Item**	**Field Type**	**Example**
1	PCHA ID	N	23
2	PCHA latitude	N	35.1225
3	PCHA longitude	N	118.334

GIS 2

GIS type 2 output uses the naming convention (GISxxxxx.xxx) where xxxxx is .... Fields are comma delimited (separated by a comma) in the order listed below. Alpha fields (A) are enclosed within quotes (“”).

Table 35			
Item No.	**Item**	**Field Type**	**Example**
1	PCHA ID	N	23
2	Fire number	A	49
3	Fire name	A	Lost Loop
4	Discovery date	D	7/4/1985
5	Discovery year	N	1985
6	Discovery month	N	7
7	Discovery day in month	N	4
8	Julian day number	N	185
9	Weekday	N	3
10	PCHA latitude	N	35.1225
11	PCHA longitude	N	118.334
12	Statistical cause	N	1
13	Total acres burned	N	0.3
14	FMZ	A	0A
15	Representative location	N	1
16	NFDRS fuel model	A	G