

Welcome to Cheetah 4

Introduction

Cheetah 4 (Computerized Harmonic Evaluation of Episodes and Tools for Assessment of Help) was developed to support examination of fire occurrence patterns and fire suppression resource requirements at the National and Geographic Area level. Questions are frequently asked regarding the expected fire suppression resource needs by the National and Geographic Area decision-makers and managers need to assess fire occurrence patterns to predict future fire suppression resource requirements.



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Cheetah 4 has two programs: Cheetah 4 Data Manager and Cheetah 4 Analyzer. The focus of this document is the Cheetah 4 Analyzer program as it is the program personnel use. The primary function of the Cheetah4 Data Manager is the loading of agency fire occurrence data into the fire occurrence database.

The purpose and function of the Cheetah 4 Analyzer program is to support examination of fire occurrence patterns and fire suppression resource requirements at the National and Geographic Area level. Questions are frequently asked regarding the expected fire suppression resource needs by the National and Geographic Area decision-makers and managers have the need to assess fire occurrence patterns to predict future fire suppression resource requirements.

The updated fire occurrence database in Cheetah 4 contains available fire occurrence data from 1980 – 2008 for the USDA Forest Service, DOI Bureau of Land Management, DOI Bureau of Indian Affairs, DOI Fish and Wildlife Service and DOI National Park Service. For Alaska, all federal and state fire occurrence data was aggregated in preparedness zones, which are treated in Cheetah 4 like an organizational unit. State fire occurrence data is included for the states of California, Oregon, Washington, Arizona and New Mexico.

Users can create Analysis Sets based on GACC, years and agency(s) for focused analysis. In addition, users can create an Analysis Set call a Predictive Service Area (PSA) based on GACC, years and organizational units.

Program Contact

Information on the Cheetah 4 program is available from:

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Analysis Products – Analyze Fire Occurrence and Episodes

The following graphs are available:

- Fire Occurrence Only
- Fire Occurrence by Cause (Human, Natural or Both)
- Fire Acres by Cause (Human, Natural or Both)
- Fire Occurrence and Episodes
- Yearly Episode Summary
- Active Fires

The following reports are available:

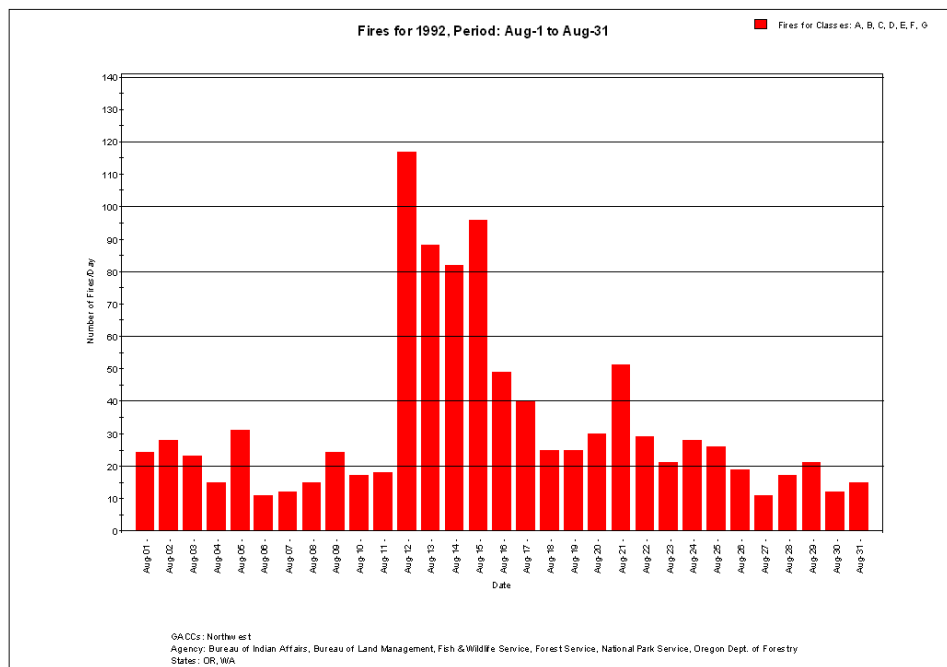
- Fire Occurrence by Cause (Human, Natural or Both)
- Fire Acres
- Episodes
- Active Fires

The following exports of data that are in graphs and reports are:

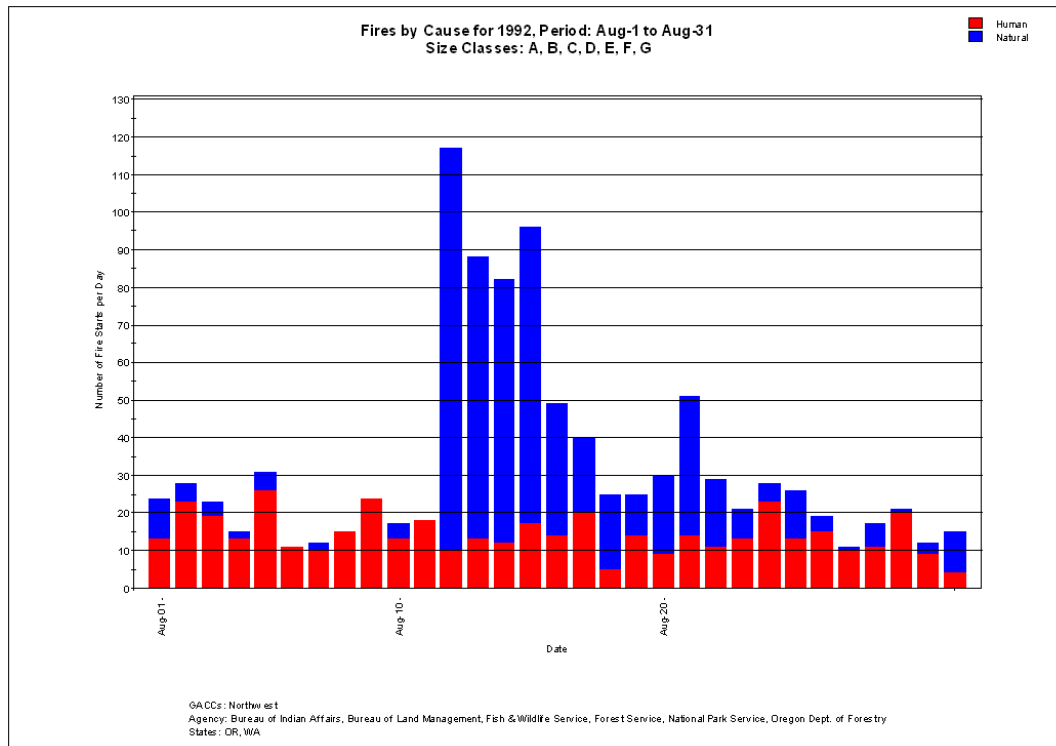
- Fire Occurrence and Episodes
- Yearly Episode Summary
- Fire Occurrence
- Average Daily Fire Occurrence by Cause
- Average Daily Fire Acres by Cause

Examples the products follow.

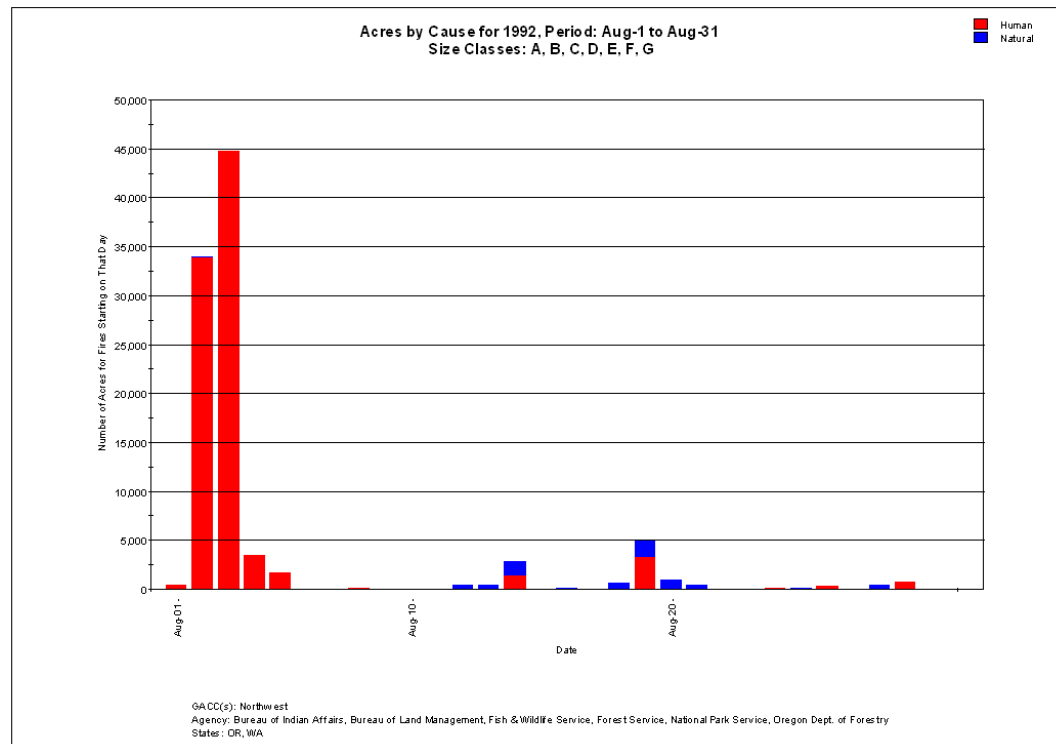
Fire Occurrence Only



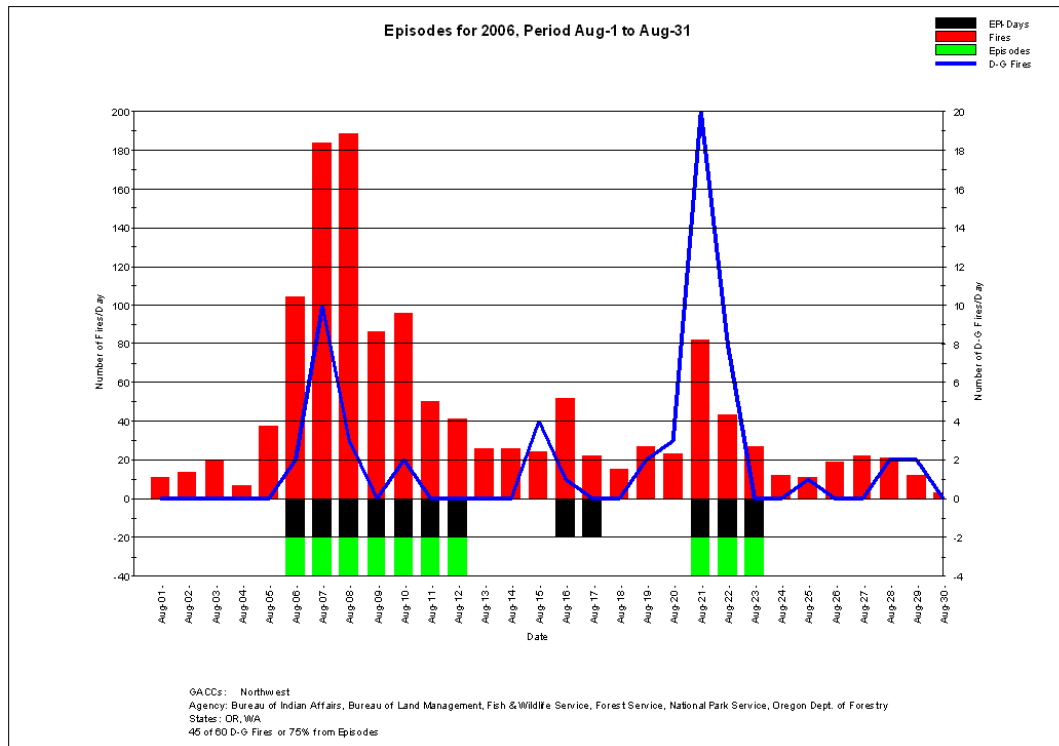
Fire Occurrence by Cause (Human, Natural or Both)



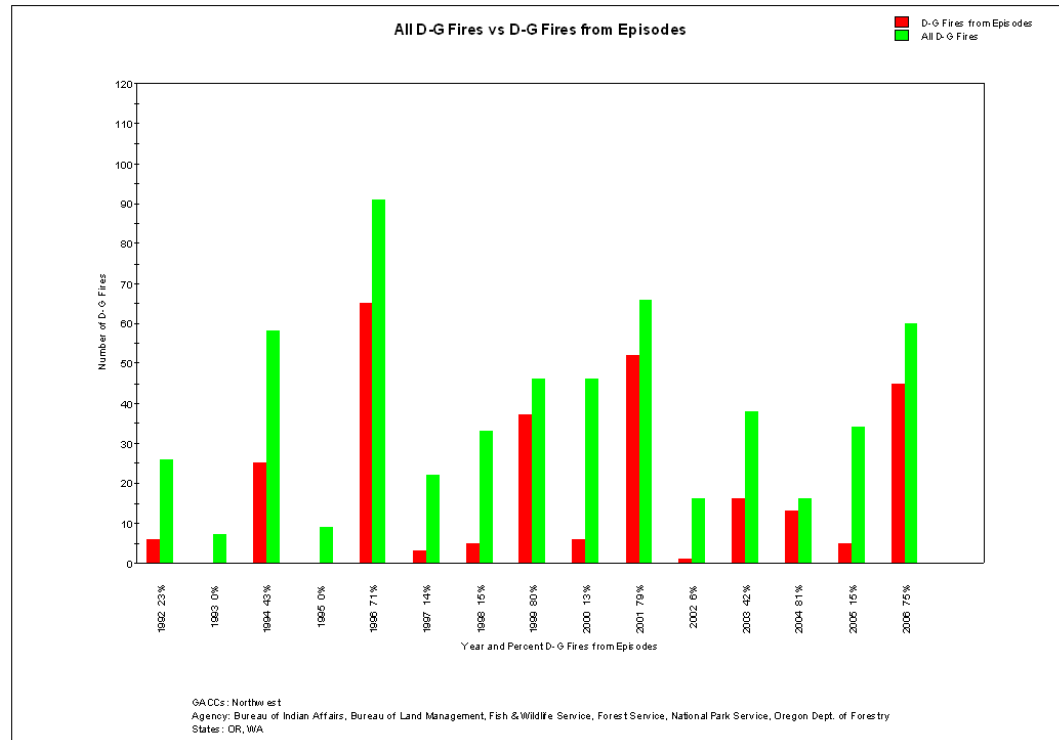
Fire Acres by Cause (Human, Natural or Both)



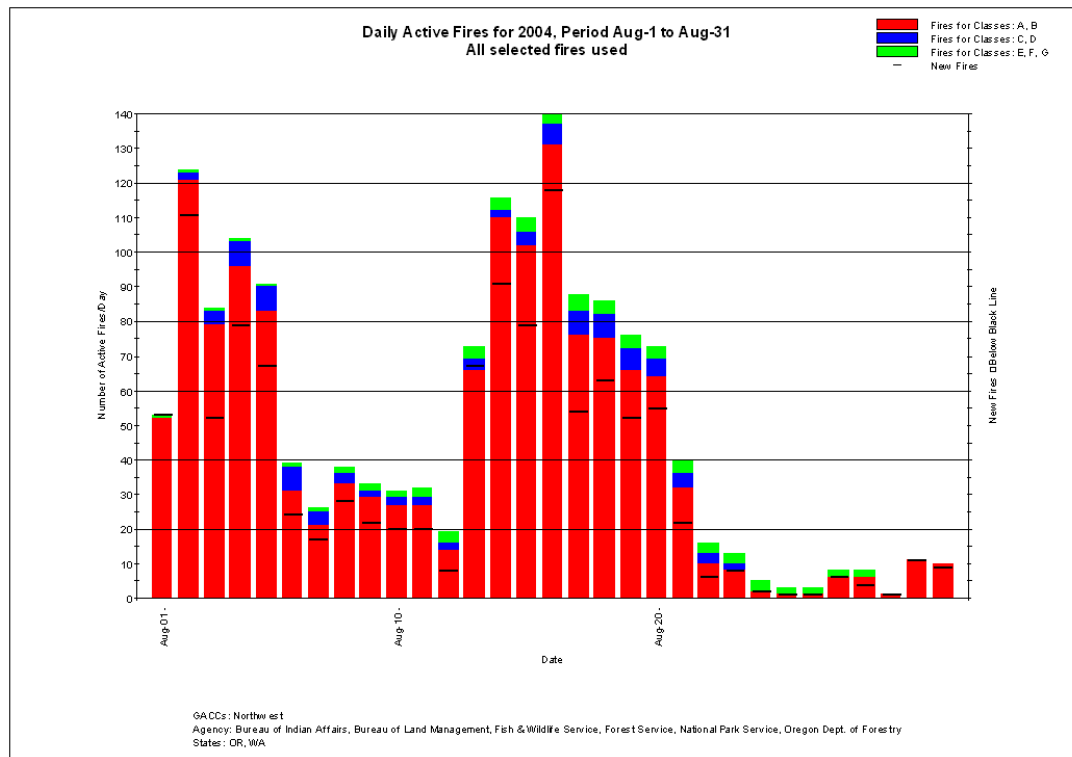
Fire Occurrence and Episodes



Yearly Episode Summary



Active Fires



The following reports are available:

Fire Occurrence by Cause (Human, Natural or Both)

Years: 2004, 2005, 2006
Period: 8/1 to 8/31
Analysis Set: NW_GACC_1997-2006.mdb
GACCs: Northwest
States: OR, WA
Agencies: Bureau of Indian Affairs, Bureau of Land Management, Fish & Wildlife Service, Forest Service, National Park Service, Oregon Dept. of Forestry
Fires: 3,247 selected from 48,437 in the Analysis Set (637,168 in the Master Database)

	Number of Fires by Size Class for Human and Natural Caused								
Year	A	B	C	D	E	F	G	Daily	Total
2004									
Total Fires for Period	844.0	274.0	17.0	8.0	2.0	4.0	2.0	N/A	1151.0
Daily Max. Fires for Period	90.0	29.0	2.0	2.0	1.0	2.0	2.0	118.0	N/A
Daily Min. Fires for Period	1.0	.0	.0	.0	.0	.0	.0	1.0	N/A
Daily Average Fires for Period	27.2	8.8	.5	.3	.1	.1	.1	37.1	N/A
Percent of Fires for Period	73.3%	23.8%	1.5%	.7%	.2%	.3%	.2%	N/A	100.0%
2005									
Total Fires for Period	517.0	194.0	33.0	7.0	9.0	12.0	6.0	N/A	778.0
Daily Max. Fires for Period	54.0	21.0	5.0	2.0	1.0	2.0	2.0	77.0	N/A
Daily Min. Fires for Period	2.0	.0	.0	.0	.0	.0	.0	5.0	N/A
Daily Average Fires for Period	16.7	6.3	1.1	.2	.3	.4	.2	25.1	N/A
Percent of Fires for Period	66.5%	24.9%	4.2%	.9%	1.2%	1.5%	.8%	N/A	100.0%
2006									
Total Fires for Period	898.0	314.0	46.0	18.0	12.0	16.0	14.0	N/A	1318.0
Daily Max. Fires for Period	133.0	51.0	11.0	7.0	3.0	5.0	7.0	189.0	N/A
Daily Min. Fires for Period	3.0	.0	.0	.0	.0	.0	.0	3.0	N/A
Daily Average Fires for Period	29.0	10.1	1.5	.6	.4	.5	.5	42.5	N/A
Percent of Fires for Period	68.1%	23.8%	3.5%	1.4%	.9%	1.2%	1.1%	N/A	100.0%
Average Fires									
Avg. Fires for Period	753.0	260.7	32.0	11.0	7.7	10.7	7.3	N/A	1082.3
Avg. Daily Max. Fires for	92.3	33.7	6.0	3.7	1.7	3.0	3.7	128.0	N/A
Avg. Daily Min. Fires for	2.0	.0	.0	.0	.0	.0	.0	3.0	N/A
Daily Avg. Fires for Period	24.3	8.4	1.0	.4	.2	.3	.2	34.9	N/A
Fire Occurrence for All Years									
Total Fires for All Periods	2259.0	782.0	96.0	33.0	23.0	32.0	22.0	N/A	3247.0
Percent Fires for All Periods	69.6%	24.1%	3.0%	1.0%	.7%	1.0%	.7%	N/A	100.0%
All Period Max. No. of Fires	898.0	314.0	46.0	18.0	12.0	16.0	14.0	1318.0	N/A
All Period Min. No. of Fires	517.0	194.0	17.0	7.0	2.0	4.0	2.0	778.0	N/A
All Period Avg. No. of Fires	753.0	260.7	32.0	11.0	7.7	10.7	7.3	1082.3	N/A



Fire Acres

Years: 2004, 2005, 2006
 Period: 8/1 to 8/31
 Analysis Set: NW_GACC_1997-2006.mdb
 GACCs: Northwest
 States: OR, WA
 Agencies: Bureau of Indian Affairs, Bureau of Land Management, Fish & Wildlife Service, Forest Service, National Park Service, Oregon Dept. of Forestry
 Fires: 3,247 selected from 48,437 in the Analysis Set (637,168 in the Master Database)

Year	Acres by Fire Size Classes							Daily	Total
	A	B	C	D	E	F	G		
2004									
Total Acres for Period	82	362	754	1,731	1,007	14,899	32,824	N/A	51,659
Daily Max. Acres for Period	9.2	46.6	98.7	452.0	707.0	9,410.0	32,824.0	32,829.4	N/A
Daily Min. Acres for Period	.0	.0	.0	.0	.0	.0	.0	.0	N/A
Daily Average Acres for Period	2.7	11.7	24.3	55.8	32.5	480.6	1,058.8	1,666.4	N/A
Percent of Acres for Period	.2%	.7%	1.5%	3.4%	1.9%	28.8%	63.5%	N/A	100.0%
2005									
Total Acres for Period	46	237	1,009	1,130	4,532	21,478	179,131	N/A	207,563
Daily Max. Acres for Period	5.3	31.7	145.0	267.0	780.0	5,187.0	65,303.0	70,969.9	N/A
Daily Min. Acres for Period	.0	.0	.0	.0	.0	.0	.0	.8	N/A
Daily Average Acres for Period	1.5	7.6	32.5	36.4	146.2	692.8	5,778.4	6,695.6	N/A
Percent of Acres for Period	.0%	.1%	.5%	.5%	2.2%	10.3%	86.3%	N/A	100.0%
2006									
Total Acres for Period	83	397	1,623	2,856	7,103	29,463	404,066	N/A	445,592
Daily Max. Acres for Period	12.7	60.5	394.0	929.8	1,948.0	10,535.0	291,279.	303,551.	N/A
Daily Min. Acres for Period	.3	.0	.0	.0	.0	.0	.0	.3	N/A
Daily Average Acres for Period	2.7	12.8	52.4	92.1	229.1	950.4	13,034.4	14,373.9	N/A
Percent of Acres for Period	.0%	.1%	.4%	.6%	1.6%	6.6%	90.7%	N/A	100.0%
Average Acres for Period									
Avg. Acres for Period	70.5	332.1	1,128.6	1,905.7	4,214.0	21,946.8	205,340.	N/A	234,938.
Avg. Daily Max. Acres for	9.0	46.3	212.6	549.6	1,145.0	8,377.3	129,802.	135,783.	N/A
Avg. Daily Min. Acres for Period	.1	.0	.0	.0	.0	.0	.0	.4	N/A
Daily Avg. Acres for Period	2.3	10.7	36.4	61.5	135.9	708.0	6,623.9	7,578.6	N/A
Acres Burned for All Years									
Total for All Periods	211	996	3,386	5,717	12,642	65,840	616,021	N/A	704,814
Percent Acres for All Periods	.0%	.1%	.5%	.8%	1.8%	9.3%	87.4%	N/A	100.0%
All Period Max. No. of Acres	83	397	1623	2856	7103	29,463	404,066	445,592	N/A
All Period Min. No. of Acres	46	237	754	1130	1007	14,899	32,824	51,659	N/A
All Period Avg. No. of Acres	70	332	1129	1906	4214	21,947	205,340	234,938	N/A



Episodes

Years: 2004, 2005, 2006
Period: 8/1 to 8/31
Analysis Set: NW_GACC_1997-2006.mdb
GACCs: Northwest
States: OR, WA
Agencies: Bureau of Indian Affairs, Bureau of Land Management, Fish & Wildlife Service, Forest Service, National Park Service, Oregon Dept. of Forestry
Fires: 48,437 selected from 48,437 in the Analysis Set (637,168 in the Master Database)

Episodes					
Year	Episode Start Date	Episode End Date	No. Of Days	Total Fires	D-G Fires
2004	Aug-1	Aug-6	6	386	6
2004	Aug-13	Aug-21	9	601	7
2005	Aug-21	Aug-23	3	144	5
2006	Aug-6	Aug-12	7	750	17
2006	Aug-21	Aug-23	3	152	28

Summary			
Year	D-G Fires From Episodes	D-G Fires All	Percent
2004	13	16	81.3%
2005	5	34	14.7%
2006	45	60	75.0%
Total	63	110	57.3%

Statistics			
	Fires Per Episode	Days Per Episode	D-G Fires Per Episode
Maximum	750.0	9.0	28.0
Average	406.6	5.6	12.6
Minimum	144.0	3.0	5.0

Probability of one of more episodes: 100% (3 years with episodes in 3 years)

Average first episode date for years with episodes: Aug-10

Average last episode date for years with episodes: Aug-23



Active Fires

Years: 2004
Period: 7/19 to 8/10
Analysis Set: NW_GACC_1997-2006.mdb
GACCs: Northwest
States: OR, WA
Agencies: Bureau of Indian Affairs, Bureau of Land Management, Fish & Wildlife Service, Forest Service, National Park Service, Oregon Dept. of Forestry
Fires: 907 selected from 48,437 in the Analysis Set (637,168 in the Master Database)

Daily Number of Active Fires								
Date	A	B	C	D	E	F	G	Total
7/19/2004	64	4			1		1	70
7/20/2004	30	6			1		1	38
7/21/2004	10	6	3		2		1	22
7/22/2004	6	8	5		2		1	22
7/23/2004	12	7	6	1	2		1	29
7/24/2004	35	13	3	3	1		1	56
7/25/2004	71	53	2	3	1		2	132
7/26/2004	25	54	2	3			1	85
7/27/2004	6	15	2	2			1	26
7/28/2004	10	11	2				1	24
7/29/2004	13	9	2			1	1	26
7/30/2004	14	3	2			1	1	21
7/31/2004	16	8	3			1	1	29
8/1/2004	40	19	2		1	1		63
8/2/2004	80	41	3	1	1	1		127
8/3/2004	30	49	2	2	1	1		85
8/4/2004	59	37	4	3	1			104
8/5/2004	58	25	3	4	1			91
8/6/2004	19	12	2	4				37
8/7/2004	10	11		3				24
8/8/2004	19	14		2			2	37
8/9/2004	14	15		1			2	32
8/10/2004	10	17	1				2	30
Statistics								
	A	B	C	D	E	F	G	Daily
Average Daily Active Fires	28.3	19.0	2.1	1.4	.7	.3	.9	52.6
Maximum Avg. Daily Active Fires	80	54	6	4	2	1	2	132
Minimum Avg. Daily Active Fires	6	3	1	1	1	1	1	21



Analysis Products – Analyze Resource Needs

This option allows the user to gather the historic fire occurrence by agency for the analysis period. Adjustments can be made by the user to define the current fire occurrence by agency and hence for all agencies for the analysis period. Once current fire occurrence is defined, the resource needs per fire-by-fire size class can be entered. Resources types in Cheetah 4 are Wildland Engines, 20-Person Crews, Type-I Helicopters, T-II Helicopters and along with an “Other” category that can be used for resource types not listed above. The entering of the current fire occurrence allows for calibration of resource needs by adjusting the resource use per fire-by-fire size class based on current use data.

Adjustments to the model can then be made by the user to define the expected fire occurrence by agency and hence for all agencies for the analysis period. Using the calibrated resource use parameters allows for the projection of expected resource needs for the analysis period.

One report is available.

- Resource Report by Resource Type

An example of the report follows:

Period: 8/1 to 8/10
 GACCs: Northern California, Southern California
 States: CA
 Agencies: Bureau of Indian Affairs, Bureau of Land Management, Fish & Wildlife Service, Forest Service, National Park Service

	Fire Size Classes							Total
	A	B	C	D	E	F	G	
Fires								
Timber/Slash	21.1	9.5	1.4	0.4	0.4	0.2	0.1	33.1
Grass/Brush	151.2	40.8	6.7	2.5	1.9	1.9	0.9	205.9
WUI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	172.3	50.3	8.1	2.9	2.3	2.1	1.0	239.0
Wildland Engines								
Timber/Slash								
Days	0.5	1.0	3.0	5.0	7.0	8.0	11.0	
Quantity Per Fire	1.0	1.0	5.0	8.0	8.0	10.0	25.0	
Grass/Brush								
Days	0.5	1.0	3.0	5.0	7.0	8.0	11.0	
Quantity Per Fire	1.0	1.0	5.0	8.0	8.0	10.0	25.0	
WUI								
Days	0.5	1.0	3.0	5.0	7.0	8.0	11.0	
Quantity Per Fire	1.0	1.0	5.0	8.0	8.0	10.0	25.0	
Total								
Avg. No. Res. Days / Fire	0.5	1.0	15.0	40.0	56.0	80.0	275.0	
No. Res. Needed for Fires	172.3	50.3	40.5	23.2	18.4	21.0	25.0	350.7
Total Res. Days for Fires	86.2	50.3	121.5	116.0	128.8	168.0	275.0	945.8