

**Cost Management Review
of the Monument Complex Fire
for the Umatilla National Forest (UNF) in Oregon**

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Financial Review Certification

This report certifies that Unit and Fire Management exercised appropriate and adequate fiscal diligence in managing this incident and that final costs for incident were appropriate and accurate.

____ Agree ____ Disagree _____ (Signature)

The Monument Complex Fire in the Umatilla National Forest included six different lighting-ignited fires that burned for 22 days from July 13 to August 3, 2007. While there were no fatalities or major safety incidents, the fire destroyed one residential structure, three commercial buildings and ten outbuildings. The fire burned a total of 54,000 acres and incurred a total cost of \$11,609,907. This paper provides a comprehensive assessment of the costs incurred to determine if fire management exercised appropriate fiscal diligence. The following first accesses the major cost drivers of the fire, including aviation, handcrew, engines, direct and indirect personnel costs to provide a fiscal review to determine the appropriateness of the costs incurred. Second, the following suggests further investigation for the lack of certain types of information that could have provided a more comprehensive cost audit. Third, the following provides a cost-per-acre analysis for the fire and suggests further outcome measurements.

I. Major Cost Drivers

a. Aviation

Aviation resources comprised of the use of long-term fixed range resources such as air tankers and fixed wings aircrafts, and short-term on-call resources such as helicopters. In the Umatilla Monument Complex fire, aviation constituted 8% (\$968,774) of the total cost incurred, where close to 30% was allocated for long-term aviation and over 70% was allocated to short-term aviation. See below table:

Aviation Cost for the July 13 - August 3, 2007 Monument Complex Fire in Umatilla National Forest (UNF), Oregon		
	Amount Spent	Percentage of Total Aviation
Long-term Aviation Resources	\$285,071	29%
AIRTANKER	\$204,106	21%
FIXED WING AIR	\$80,965	8%
Short-term Aviation Resources (call when needed)	\$683,703	71%
HEAVY HELI	\$279,581	29%
LIGHT HELI	\$167,700	17%
MEDIUM HELI	\$236,422	24%
Aviation Grand Total	\$968,774	100%

The ratio of long-term aviation to short-term aviation resources used is 1:2 and this seems inappropriate. Short-term aviation resources, such as helicopters, are supposed to be used on a call-as-needed basis. If there is twice the need for short-term aircrafts, then more allocation should be shifted to have long-term aviation be available. The allocation between long-term and short-term aviation should be half and half, if not more for long-term aviation and less for short-term aviation.

The inappropriateness of aviation resources used is further reinforced by looking at the daily usage of various aircrafts (Please see Appendix II). In a wild fire, aviation resources are typically used during the front end, the first 3 to 5 days, to find the locations of fires and to put small fires out. In the Umatilla Monument Complex fire, aviation resources were used consistently throughout the entire duration of the fire. Even though the spike in air tanker usage

on day 5 to day 8 seemed appropriate since this period is in the front end of the fire, all other aircrafts were used almost similarly and continuously throughout the fire. Helicopters were used beginning on the third day of the fire and their usage continued through the entire fire. Helicopters are supposed to be short-term and used as needed. The continuous usage of helicopters in the Umatilla Monument Complex fire signals that aviation resources were mis-used. Someone is hanging on the aviation resources even though aircrafts may no longer be necessary in fighting the fire. The use of aviation resources in this fire warrants further investigation.

b. Handcrew

Handcrew resources comprised of the use of type-1 national team, type 2 regional team and other local teams. In the Umatilla Monument Complex fire, handcrew constituted 28% (\$3,313,953) of the total cost incurred, where type 2 regional handcrew alone constituted 22% of total cost incurred (\$2,578,404), which is close to 80% of total handcrew cost. See below table:

Handcrew Cost for the July 13 - August 3, 2007 Monument Complex Fire in Umatilla National Forest (UNF), Oregon		
	Amount Spent	Percentage of Total Handcrew
HANDCREW-TYPE 1	\$315,614	10%
HANDCREW-TYPE 2	\$2,578,404	78%
HANDCREW-OTHER/LOCALS	\$419,935	13%
Handcrew Grand Total	\$3,313,953	100%

In a common wild fire, handcrew usage would go up in the middle when there is less or no aviation resources, and handcrew usage would decline toward the end of the fire. With the exception of the first two days and the last three days of the fire, type 1 national team was used consistently throughout the fire. Local team was used only on the 19th day of the fire, and type 2 regional team was used daily except for the last two days of the fire (day 21 and day 22) and had a graduate increased usage in the middle.

There is an exceptionally heavy usage of type 2 regional teams throughout the fire (Please see Appendix III). Since aviation resources were used consistently in the Umatilla Monument Complex fire, there should not be a spike in handcrew usage unless there is a significant decrease in aviation usage on a specific day. Looking at the period from day 6 to 13, there is both an increased usage in aviation resources as well as type 2 regional handcrew. This would make sense if the fire was being strongest during this period. However, the Umatilla Monument Complex fire was not considered such a remarkable fire that would require heavy usage of aviation and handcrew resources at the same time. In addition, the fire was being handed over to the local team on day 19, which means the fire should be dying and only local teams are needed to do a clean up. However, type 2 regional team continued to be involved in the fire on day 20. This raises the question as to what the regional team is doing there even after the local team has moved in to close the fire. In addition, type 2 regional teams are generally less experienced and cost less than type 1 national teams. In this fire, the cost of type 2 team is more than seven times the cost and usage of type 1 national team. The excessive use of type 2 regional handcrew in this fire warrants further investigation.

c. Engines

Fire engine is another resource used heavily in the Umatilla Monument Complex fire, constituting about 15% (\$1,749,884) of the total cost incurred. The use of engines experienced a gradual increase from day 1 to day 5, heavy usage from day 5 to day 15, and a gradual decrease from day 15 to the end of the fire (please refer to Appendix IV). In a common wild fire, engine usage would go up in the middle when there is less or no aviation or handcrew resources, or if the fire is burning the strongest. At first glance, the use of engines in the Umatilla fire seems appropriate, since the fire was strong during day 5 to day 15. However, both aviation and handcrew costs were also increasing significantly during this period. The three resources: aviation, handcrew, and engines, seem to have a direct relationship with each other where they all increased at the same time. It is necessary to determine if the fire was so remarkable that would result in an increase of all types of fire fighting resources simultaneously during that period of time.

d. Direct Personnel and Indirect Personnel Costs

Personnel costs in the Umatilla Monument Complex fire constitutes about 19% (\$2,181,237) of the total cost incurred. There are two different types of personnel costs: direct personnel costs and indirect personnel cost. In this fire, direct and indirect personnel costs are very similar, where the ratio is about 1:1. Daily personnel costs (please refer to Appendix V) show little variation throughout the duration of the fire, with the exception of a spike in direct personnel costs on day 21 (\$402,274). Personnel costs seem not to vary during the fire even when there is an increase in aviation, handcrew, and engine usage. These costs maybe fixed or at least, a heavy portion is fixed, which results in little variation overtime. Direct personnel costs experience a dramatic increase on day 21 when there is no handcrew and engine usage, and very minimum aviation usage. It is necessary to determine what direct personnel costs encompasses and specifically, why is there a spike on day 21 when other resources were not being utilized and what variables are involved to result in the spike.

Personnel Cost for the July 13 - August 3, 2007 Monument Complex Fire in Umatilla National Forest (UNF), Oregon			
		Percentage of Total Personnel Cost	Percentage of Total Cost
DIRECT PERSONNEL	\$1,145,950	53%	10%
INDIRECT PERSONNEL	\$1,035,287	47%	9%
Total Personnel Cost	\$2,181,237	100%	19%

II. Lack of Cost Information Warranting Further Investigation

In addition to each of the four major cost drivers mentioned above requiring further investigation, more specific information regarding contract and overhead costs are necessary to conduct a comprehensive assessment of the costs. The information provided by the national panel report and the ICARS national reporting system does not explicitly state if any of the costs incurred are a result of overhead charges or contract-based charges. Looking at overhead charges would provide a better picture of cost compliance. For example, this could clarify if certain departments or certain area of resources may have incurred unnecessary or too much overhead charges. Looking at contract-based resource usage also allows for a better picture of

cost appropriateness. Certain resources, such as aviation or equipment, used on a contract-basis per fire may explain why their cost does not vary throughout the duration of the fire. If that is the case, it is necessary to re-evaluate the use of contracts for these resources and how to minimize unnecessary usage/costs.

Another type of information lacking is the intensity of the fire per day directly affecting the use of the above mentioned resources. Although the ICARS weekly summary reports provides a very brief daily report of resources used and the condition of the fire, such as location and containment level, it does not provide sufficient details regarding the intensity of the fire or the overall situation faced. The one to two sentences daily description does not provide any insights as to why the use of certain resources, such as air tankers vs. helicopters, are necessary. The Umatilla Monument Forest Fire utilized aviation, handcrew, and engines simultaneously throughout the entire fire. It is necessary to get a detailed description of the situation, such as the specific terrain type, ease of access, fire intensity, etc., in order to determine if the simultaneous use and increase in use of these resources are appropriate. In another word, is the fire really so remarkable that it requires an increase in all resources at the same time and throughout the entire duration of the fire?

III. Cost-per-acre and Recommendations

The Umatilla Monument Complex Fire burned a total of 54,000 acres and incurred a total cost of \$11,609,907, resulting in \$215 cost per acre. Simply looking at the cost per acre does not provide a clear idea on fiscal inappropriateness. On the other hand, the \$215 cost per acre would signal a below average cost of the fire when comparing it to other wildfires in 2007. According to the ICARS data on wildfires exceeding \$10 million in cost in fiscal year 2007, other fires with similar total acres burned had a higher cost per acre. For example, the Ahom fire burned 52,505 acres and incurred a total cost of over \$17 millions dollars, resulting in a cost-per-acre of \$334. Other fires with similar total costs burned less footage. For example, the Ham Lake fire incurred a total cost of \$11,017,155 only burned 36,443 acres, resulting in a cost of acre of \$302. The Umatilla Monument Complex Fire's \$215 cost per acre surprising gives an indication of it being a low cost fire. Without looking at the resources usage throughout the fire, it is impossible to realize there are areas of possible wasteful spending that warrant further investigation.

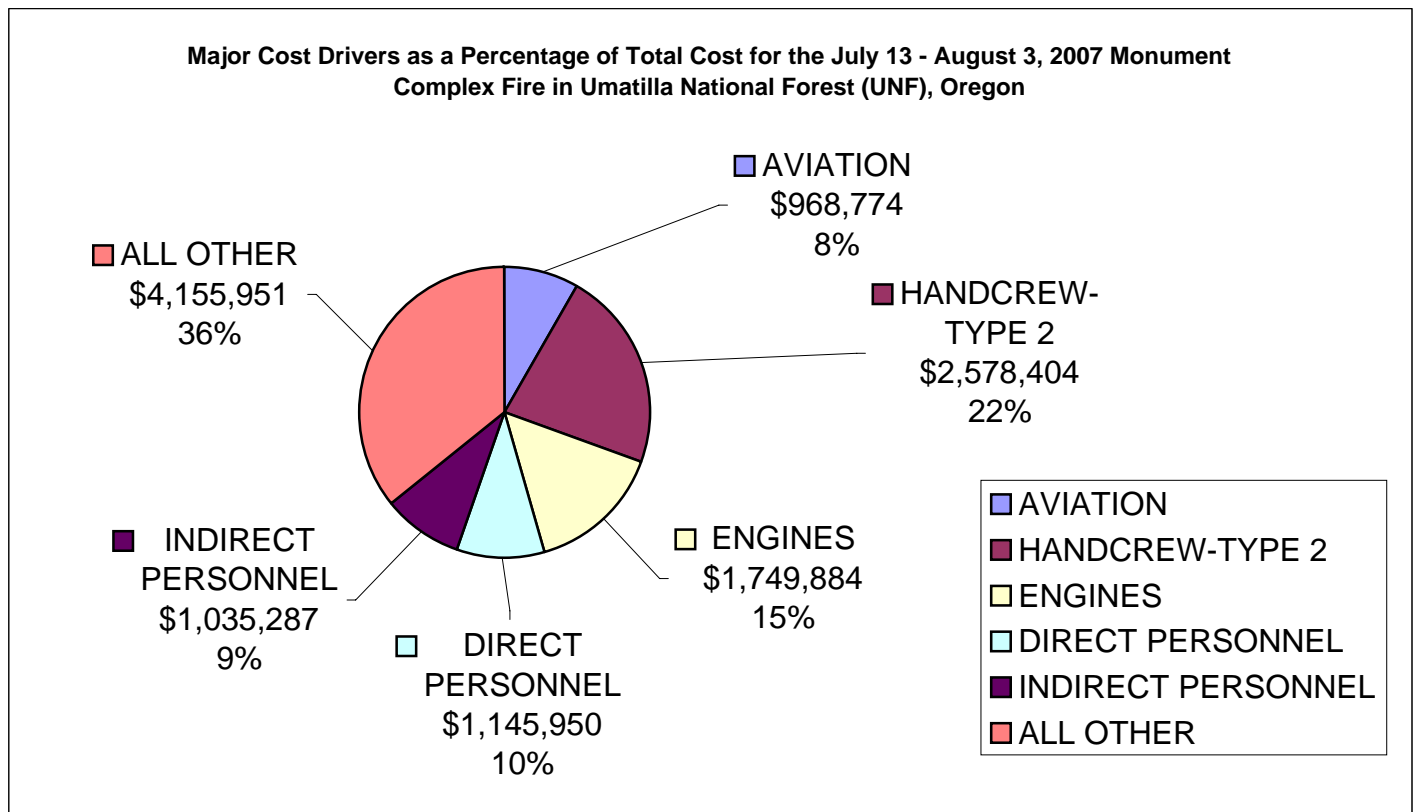
To determine if fire management for the Umatilla Monument Complex Fire exercised appropriate and adequate fiscal diligence, detailed information regarding aviation, handcrew, engines, direct and indirect personnel resources usage is necessary. Explicit guidelines should be established and monitored regarding the appropriate usage of specific aviation resources and in regards to inviting regional vs. national handcrews. In addition, information regarding overhead and possible contract costs and terms are needed to determine if unnecessary charges were incurred. Besides property damages, injuries and explicit costs incurred, the intensity, fire route, ease of access, and weather should be included when evaluating the appropriateness of the cost incurred. These factors may create an implicit challenge for fire fighting which may indirectly drive up the cost of the fire. For example, a challenging terrain may result in the use of more aviation resources, or it may increase the use of gasoline required for fire fighting engines which would increase the cost of engine use. Unless this type of information is available to support the excessive costs of the major cost drivers, fire management for the Umatilla Monument Complex Fire did not exercise appropriate and adequate fiscal diligence.

**Summary Table of Cost Categories for the July 13 - August 3, 2007
Monument Complex Fire in Umatilla National Forest (UNF), Oregon**

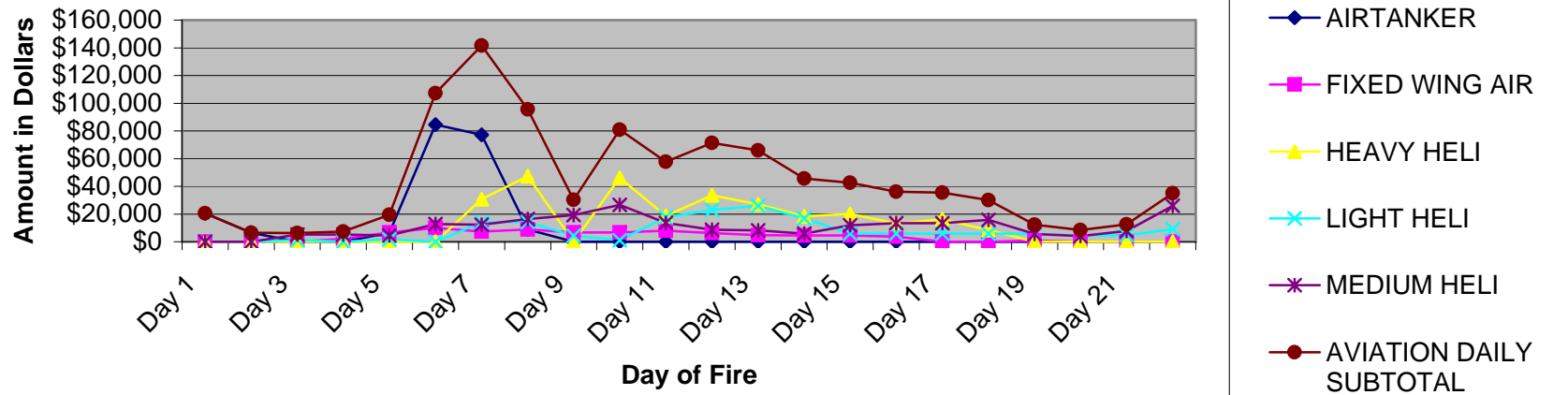
Categories highlighted in **Red** denotes major cost drivers of the fire.

COST	Amount
AIRTANKER	\$204,106
FIXED WING AIR	\$80,965
HEAVY HELI	\$279,581
LIGHT HELI	\$167,700
MEDIUM HELI	\$236,422
AVIATION SUBTOTAL	\$968,774
HANDCREW-OTHER	\$419,935
HANDCREW-TYPE 1	\$315,614
HANDCREW-TYPE 2	\$2,578,404
HANDCREW SUBTOTAL	\$3,313,953
DOZERS	\$448,854
ENGINES	\$1,749,884
LOWBOY-TRANSP.	\$257,697
OTHER EQUIPMENT	\$82,936
WATER TENDERS	\$368,130
EQUIPMENT SUBTOTAL	\$2,907,501

COST	Amount
DIRECT PERSONNEL	\$1,145,950
INDIRECT PERSONNEL	\$1,035,287
BUSSES	\$67,034
CAMP CREW	\$69,483
CATERER	\$609,766
FACILITIES	\$166,915
MOB/DEMOB	\$578,639
OTHER EQUIPMENT	\$225,814
OTHER SUPPORT	\$103,602
OTHER VEHICLES	\$180,452
SHOWERS	\$99,011
SUPPLIES	\$162,070
OTHER MISC	\$2,262,785
GRAND TOTAL	\$11,634,250



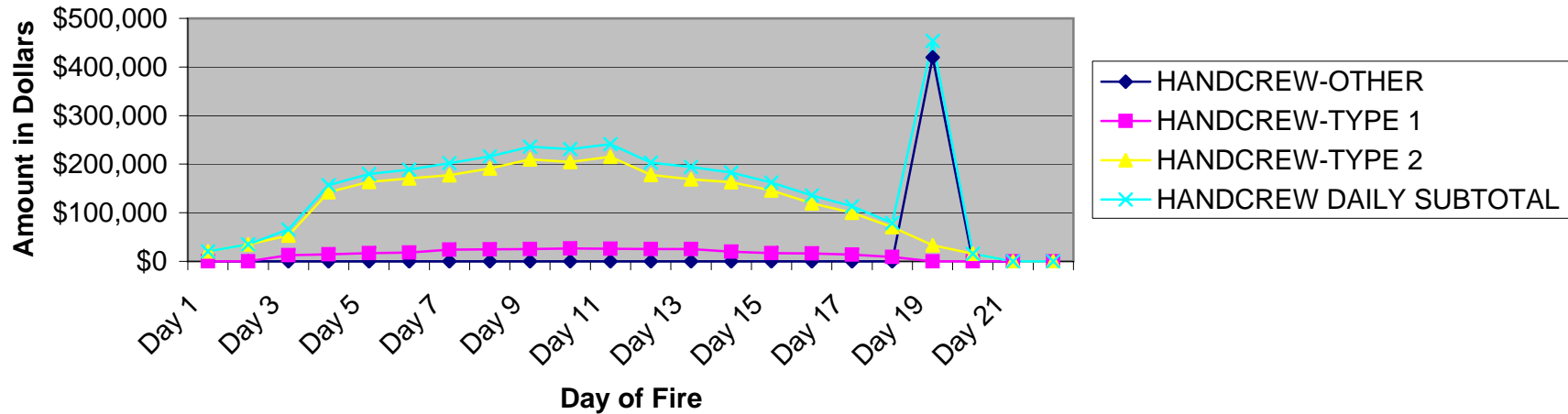
**Daily Aviation Cost for the July 13 - August 3, 2007
Monument Complex Fire in Umatilla National Forest (UNF), Oregon**



	Day 1 7/13/2007	Day 2 7/14/2007	Day 3 7/15/2007	Day 4 7/16/2007	Day 5 7/17/2007	Day 6 7/18/2007	Day 7 7/19/2007	Day 8 7/20/2007	Day 9 7/21/2007	Day 10 7/22/2007	Day 11 7/23/2007
AIRTANKER	\$20,519	\$6,448	\$0	\$0	\$6,564	\$84,564	\$77,165	\$8,846	\$0	\$0	\$0
FIXED WING AIR	\$0	\$0	\$0	\$2,244	\$6,622	\$9,980	\$7,357	\$8,765	\$6,617	\$6,704	\$7,913
HEAVY HELI	\$0	\$0	\$0	\$0	\$0	\$0	\$30,665	\$47,333	\$0	\$46,308	\$18,496
LIGHT HELI	\$0	\$0	\$1,245	\$0	\$1,724	\$0	\$14,150	\$14,197	\$4,335	\$1,150	\$17,792
MEDIUM HELI	\$0	\$0	\$5,123	\$5,123	\$4,573	\$12,748	\$12,245	\$16,366	\$19,253	\$26,655	\$13,521
AVIATION DAILY SUBTOTAL	\$20,519	\$6,448	\$6,368	\$7,367	\$19,483	\$107,292	\$141,582	\$95,507	\$30,205	\$80,817	\$57,722

	Day 12 7/24/2007	Day 13 7/25/2007	Day 14 7/26/2007	Day 15 7/27/2007	Day 16 7/28/2007	Day 17 7/29/2007	Day 18 7/30/2007	Day 19 7/31/2007	Day 20 8/1/2007	Day 21 8/2/2007	Day 22 8/3/2007
AIRTANKER	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
FIXED WING AIR	\$6,260	\$4,841	\$4,436	\$4,541	\$3,777	\$0	\$0	\$908	\$0	\$0	\$0
HEAVY HELI	\$33,421	\$27,015	\$18,400	\$20,186	\$13,171	\$16,226	\$8,360	\$0	\$0	\$0	\$0
LIGHT HELI	\$22,819	\$25,893	\$16,849	\$5,901	\$5,898	\$5,898	\$5,898	\$5,815	\$4,361	\$4,775	\$9,000
MEDIUM HELI	\$8,752	\$8,259	\$5,935	\$11,950	\$13,317	\$13,317	\$15,803	\$5,566	\$4,175	\$7,742	\$26,000
AVIATION DAILY SUBTOTAL	\$71,252	\$66,008	\$45,620	\$42,578	\$36,163	\$35,441	\$30,061	\$12,289	\$8,536	\$12,517	\$35,000

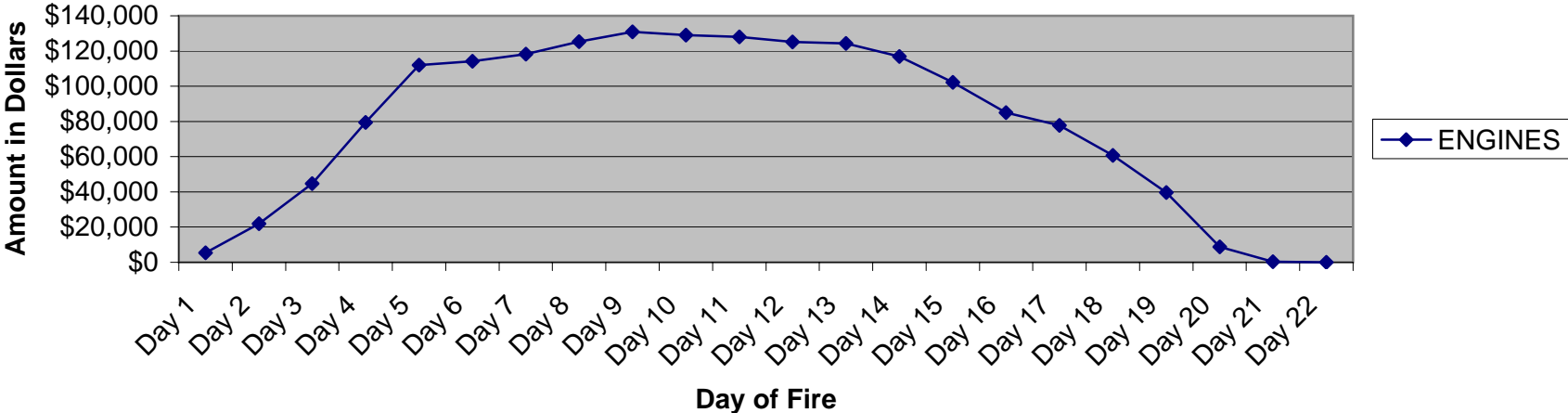
**Daily Handcrew Cost for the July 13 - August 3, 2007
Monument Complex Fire in Umatilla National Forest (UNF), Oregon**



	Day 1 7/13/2007	Day 2 7/14/2007	Day 3 7/15/2007	Day 4 7/16/2007	Day 5 7/17/2007	Day 6 7/18/2007	Day 7 7/19/2007	Day 8 7/20/2007	Day 9 7/21/2007	Day 10 7/22/2007	Day 11 7/23/2007
HANDCREW-OTHER	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
HANDCREW-TYPE 1	\$0	\$0	\$12,780	\$14,566	\$16,680	\$18,002	\$24,360	\$24,796	\$25,624	\$26,455	\$26,174
HANDCREW-TYPE 2	\$20,781	\$35,238	\$52,978	\$142,212	\$163,340	\$170,738	\$177,409	\$190,940	\$210,127	\$204,352	\$215,369
HANDCREW DAILY SUBTOTAL	\$20,781	\$35,238	\$65,757	\$156,777	\$180,019	\$188,740	\$201,769	\$215,736	\$235,751	\$230,807	\$241,543

	Day 12 7/24/2007	Day 13 7/25/2007	Day 14 7/26/2007	Day 15 7/27/2007	Day 16 7/28/2007	Day 17 7/29/2007	Day 18 7/30/2007	Day 19 7/31/2007	Day 20 8/1/2007	Day 21 8/2/2007	Day 22 8/3/2007
HANDCREW-OTHER	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$419,935	\$0	\$0	\$0
HANDCREW-TYPE 1	\$25,355	\$25,355	\$19,695	\$16,725	\$16,500	\$13,750	\$8,800	\$0	\$0	\$0	\$0
HANDCREW-TYPE 2	\$177,990	\$168,869	\$163,141	\$145,749	\$119,473	\$99,900	\$70,464	\$33,456	\$15,877	\$0	\$0
HANDCREW DAILY SUBTOTAL	\$203,345	\$194,224	\$182,836	\$162,474	\$135,973	\$113,650	\$79,264	\$453,391	\$15,877	\$0	\$0

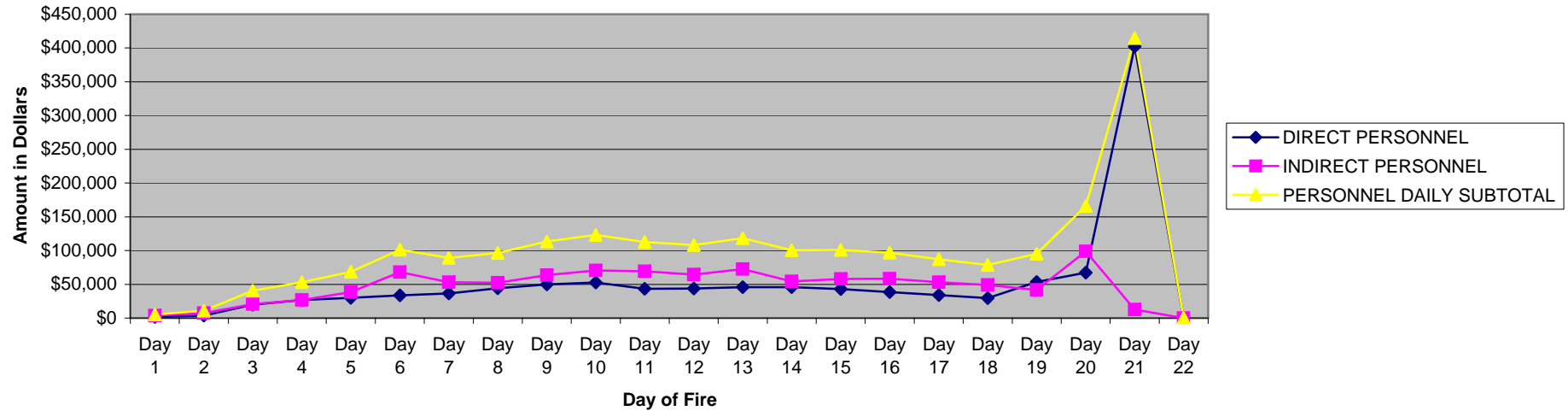
**Daily Engines Cost for the July 13 - August 3, 2007
Monument Complex Fire in Umatilla National Forest (UNF), Oregon**



	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11
	7/13/2007	7/14/2007	7/15/2007	7/16/2007	7/17/2007	7/18/2007	7/19/2007	7/20/2007	7/21/2007	7/22/2007	7/23/2007
ENGINES	\$5,475	\$21,929	\$44,740	\$79,434	\$111,917	\$114,109	\$118,248	\$125,363	\$130,878	\$129,000	\$128,011

	Day 12	Day 13	Day 14	Day 15	Day 16	Day 17	Day 18	Day 19	Day 20	Day 21	Day 22
	7/24/2007	7/25/2007	7/26/2007	7/27/2007	7/28/2007	7/29/2007	7/30/2007	7/31/2007	8/1/2007	8/2/2007	8/3/2007
ENGINES	\$125,115	\$124,250	\$116,851	\$102,279	\$85,005	\$77,793	\$60,726	\$39,630	\$8,732	\$400	\$0

Daily Personnel Cost for the July 13 - August 3, 2007 Monument Complex Fire in Umatilla National Forest (UNF), Oregon



	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11
	7/13/2007	7/14/2007	7/15/2007	7/16/2007	7/17/2007	7/18/2007	7/19/2007	7/20/2007	7/21/2007	7/22/2007	7/23/2007
DIRECT PERSONNEL	\$1,665	\$3,646	\$19,831	\$26,531	\$29,937	\$33,501	\$36,277	\$44,270	\$49,875	\$52,682	\$43,279
INDIRECT PERSONNEL	\$3,595	\$7,285	\$20,477	\$26,556	\$38,606	\$67,866	\$52,916	\$52,091	\$63,549	\$70,364	\$69,365
PERSONNEL DAILY SUBTOTAL	\$5,260	\$10,931	\$40,308	\$53,087	\$68,543	\$101,367	\$89,193	\$96,361	\$113,424	\$123,046	\$112,644

	Day 12	Day 13	Day 14	Day 15	Day 16	Day 17	Day 18	Day 19	Day 20	Day 21	Day 22
	7/24/2007	7/25/2007	7/26/2007	7/27/2007	7/28/2007	7/29/2007	7/30/2007	7/31/2007	8/1/2007	8/2/2007	8/3/2007
DIRECT PERSONNEL	\$43,858	\$45,847	\$45,957	\$42,809	\$38,420	\$34,224	\$29,737	\$53,526	\$67,239	\$402,274	\$567
INDIRECT PERSONNEL	\$64,286	\$72,608	\$54,440	\$57,985	\$58,343	\$53,020	\$48,877	\$41,708	\$98,927	\$12,424	\$0
PERSONNEL DAILY SUBTOTAL	\$108,144	\$118,455	\$100,397	\$100,794	\$96,763	\$87,244	\$78,614	\$95,234	\$166,166	\$414,698	\$567