Burned Area Emergency Response – Erosion Estimates

- Once the fire has cooled…
- Then what?

BAER Team Assessment

- Hydrologists
- Soil Scientists
- Recreation Specialists
- Wildlife Biologists
- Archeologists

Burned Area Emergency Response Team

A group of resource specialists who assess the damage to Values at Risk.

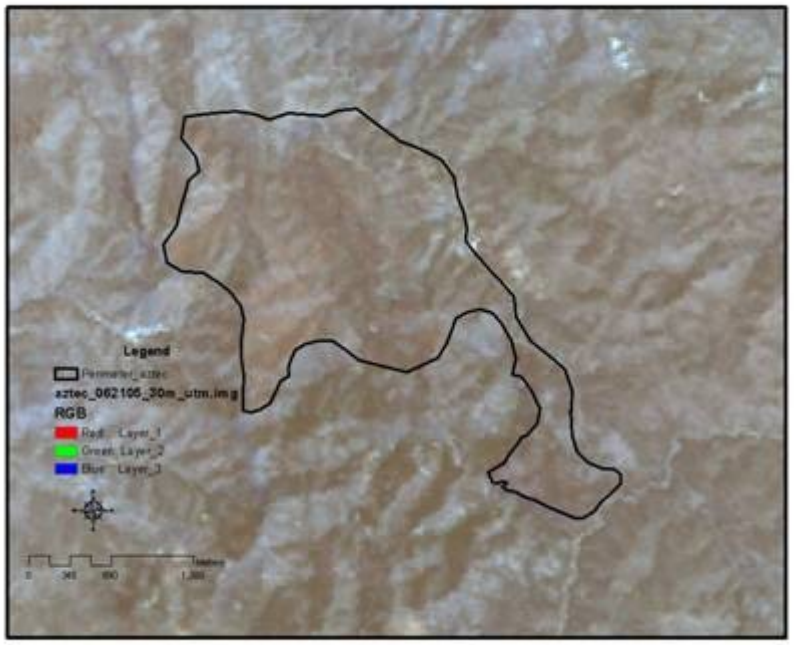
Burned Area Assessment

- ***High Fire Severity*- areas are characterized by complete consumption of both canopy and ground fuels. Black to white ash is 1 to 3 inches thick and minimally effective as ground cover. Water repellent soils are present. Experience shows that, regardless of the degree of water repellency, areas such as the Southwest that have short duration, high intensity storms will produce extreme runoff events if most of the vegetative cover has been removed.**
- ***Moderate Fire Severity*- areas are characterized by partial consumption of both canopy and ground fuels. The conifers in the canopy contain mostly scorched needles. Ash color is mostly gray with needle structure intact in places. Ash depth is 2 to 3 inches.**
- ***Low Fire Severity*- areas are characterized by incomplete consumption of both canopy and ground fuels and contain adequate effective ground cover. The over story is mostly green with limited scorch. The litter layer is scorched with black ash retaining the structure of needles and leaves. The depth of ash is 1 to 2 inches with the litter intact below it.**

Adapted from: *Fire Effects on Ecosystems* (1998) by Leonard DeBano, Dan Neary, and Pete Ffolliot)

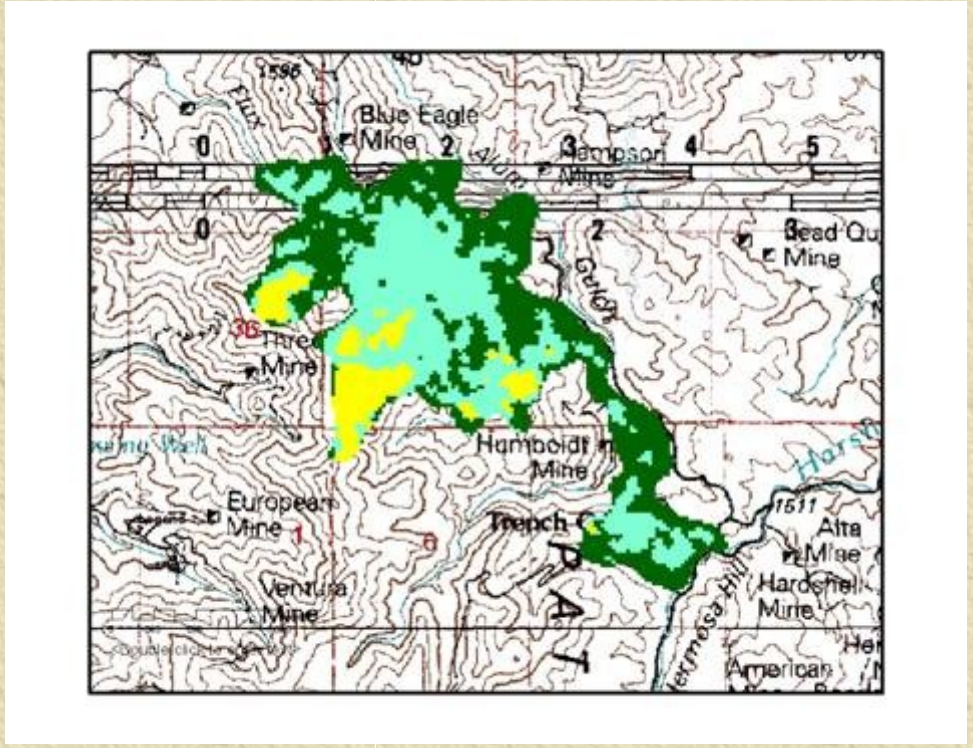
Burned Area Map

- **A satellite image is acquired, if available.**
- **With interpretation, it becomes very useful**



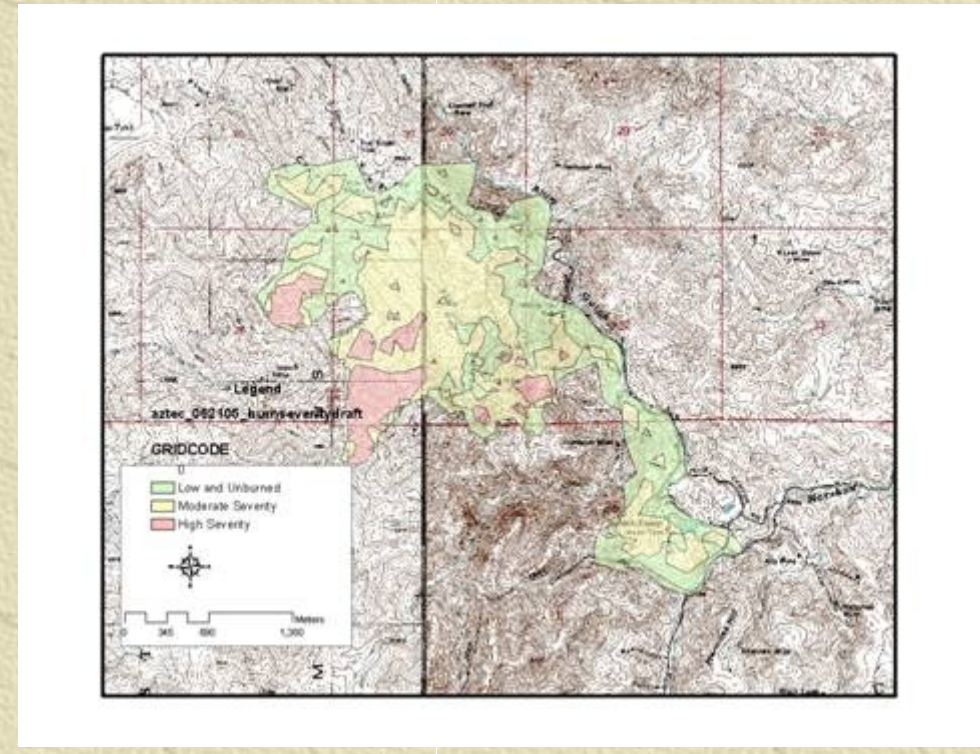
Burned Area Map

- **The interpreted satellite image is used with field and aerial reconnaissance to verify the interpretations.**



Burned Area Map

- **Using satellite imagery, aerial reconnaissance, and field trips, a map of the fire identifying areas of high, moderate, and low burn severity is developed.**



Data for Estimating Erosion

Once the map is completed:

- **Develop data**
- **Acres of each burn severity level**
- **Slope Classes of acres burned at each severity level**

GES MAP UNIT	avg slope, %	Veg Comp.	acres low sev.	acres mod. sev.	acres high sev.
ASPEN					
452	60	Psmeg	178.0	1322	2018
476	60	Quem/Psmeg	311.0	6107	11757
235	60	Cemi2	713.0	539	75
475	60	Fosp2/Quem	316.0	22621	13831
303	60	Fosp2/Qutu2	14142.0	3490	4988
490	25	Prgl2/Quem	0.0	43	439

Models for Estimating Erosion

Wildland Erosion Prediction Project (WEPP)

Preburn	Total acres	Average Erosion rate tons/acre	Total Erosion Rate	Total sediment yield
Sediment Delivery Ratio	**90**	**3.815**	162.9	**100.998**
0.62				
Post Fire	**Total acres**	**Average Erosion rate**	Total Erosion Rate	**Total sediment yield**
Sediment Delivery Ratio	90	13.620889	1225.88	760.0456
0.62				

Models for Estimating Erosion

Universal Soil Loss Equation (USLE)

								Totals
103 Fire USLE Post Burn								
Soil Code			flat	steep low	steep mod	steep high		
USLE Erosion		t/a/yr	1.476956	15.87939	42.13349	43.23848	0	9.709652
USLE Erosion		in/ac/yr	0.008951	0.096239	0.255354	0.262051	0	
Soil Erosion		tons/yr	1260.76	2302.512	1316.672	302.6693	0	5182.612
Sediment delivery ratio			0.2	0.2	0.2	0.2	0.2	
Sediment yield		t/yr	252.1519	460.5024	263.3343	60.53387	0	1036.522

Objectives of Proposed Treatments

- **stabilize soil**

- **control water,sediment and debris movement**

- **minimize impairment of ecosystems.**

Coronado National Forest

Monitor the Treatments

6/17/2002

10/25/2002

- **Monitor to make sure these emergency treatments were implemented correctly**
- **Monitor the effectiveness of these emergency treatments**

Long Term Recovery

- **The public is concerned about their Forest**
- **Long Term recovery will continue to be of great interest.**

Carr Fire Photo Point 3 9/1999