

FIRELINE HANDBOOK

**CHAPTER 14—FIRE
INVESTIGATION**

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SAFETY FIRST—NO EXCEPTIONS

FIRE INVESTIGATION**Investigation Procedures**

Protect area of origin and consider the need for a qualified Fire Investigator. The success of the investigation and law enforcement will depend upon your actions. Secure all information and evidence possible.

EN ROUTE TO FIRE

- Make note of the smoke column. Note color, size, direction of travel, and any changes in its appearance.
- When practical, note the license number, make, model, and color of any vehicles that you pass en route to the scene. Note the time and direction of travel. Attempt to determine the number of occupants and a description of them if possible.
- Note the condition (open, closed, locked, unlocked) of any gates accessing the fire area.
- Note any activities near the fire area that might be associated with the cause (road construction, logging, blasting, etc.).

AT FIRE AREA

- Note any campers in the area.
- Note any evidence of a large gathering of people, such as:
 - ✓ Large accumulations of trash.
 - ✓ Fire circles.
 - ✓ Areas of large amounts of soil disturbance by motorcycles, dune buggies, and four-wheel drive vehicles.
- Locate and protect the general area of origin. There may be more than one ignition area.
- Secure this area with barrier tape or flagging and keep vehicles and suppression activities away from this area.
- Check for evidence of lightning, being careful not to disturb the general area of origin.
- Look over the area for apparent human causes.
- If evidence or any material foreign to area indicates fire is human-caused, a qualified investigator should be obtained. Do not attempt to collect physical evidence or disturb the general area or origin. The qualified investigator will conduct further investigation. If fragile physical evidence is discovered, protect it from damage by flagging it off and keeping suppression activities away from it.

- Upon arrival, take weather readings that as a minimum include temperature, wind direction and speed, and relative humidity. Provide this information to the qualified investigator.
- Note any vehicles that drive by the origin area. Record license numbers, make, model, color, and descriptions of any occupants, and note the time and how many times they pass by.
- Persons at the scene should be interviewed when possible. The interview is an **INFORMAL DISCUSSION** with persons(s) that may have knowledge of the fire cause.

Information obtained will be voluntary. The informant will not be coerced into providing any information. It is not necessary for the person being interviewed to sign any document connected with the fire, nor is it necessary to read him the “Notice of Rights.” The interview should provide the skilled investigator with leads to continue the investigation. The interview should contain the following basic information:

- ✓ Time and date.
- ✓ Name(s), address(es), and telephone number(s) of those interviewed.
- ✓ Write down the information as told by those you are interviewing. Don’t discourage them from telling what they saw and heard.

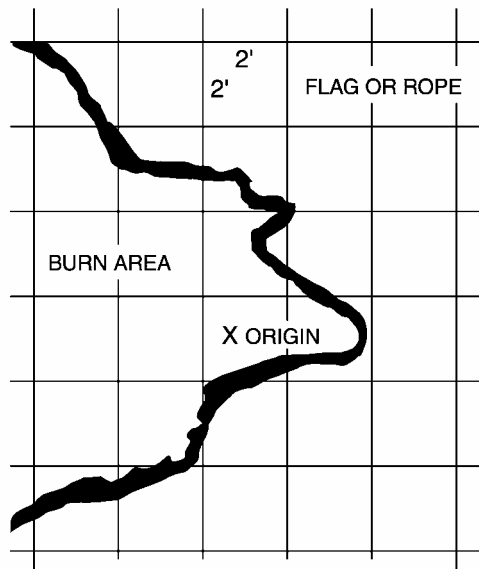
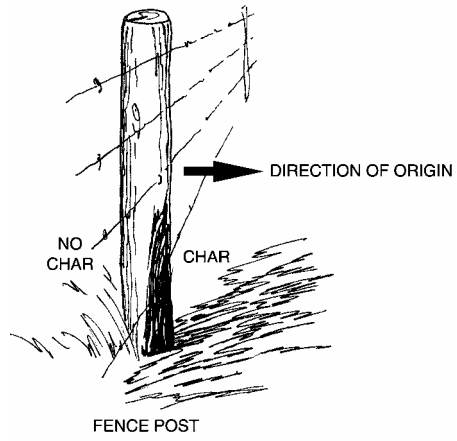
- ✓ Note description and license number of vehicles that remain in area when you arrive. They may belong to individuals who were not interviewed.

AIDS TO FINDING ORIGIN OF FIRE

The fire origin is the key to fire investigation. Evidence at the origin can provide important information regarding the cause of the fire. Therefore, identifying and protecting this area should be a high priority for the first responder. Protect the fire origin.

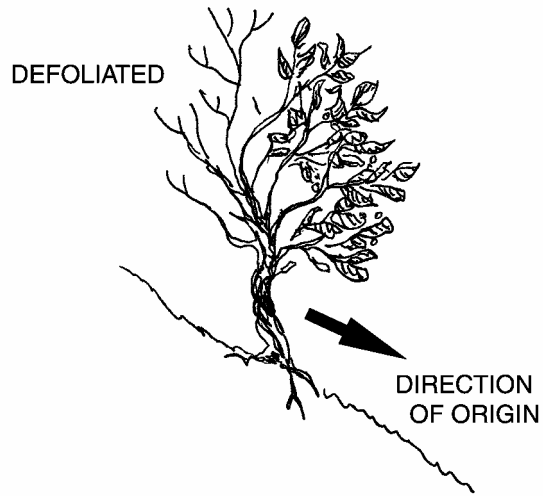
When the fire scene is reached, set up a systematic search of the area surrounding the origin. Look for the obvious to the most minute.

Burned fence post shown below will help locate the origin. Fire will usually burn hot on the side toward the origin. Grey ash will be prevalent on the hot side.

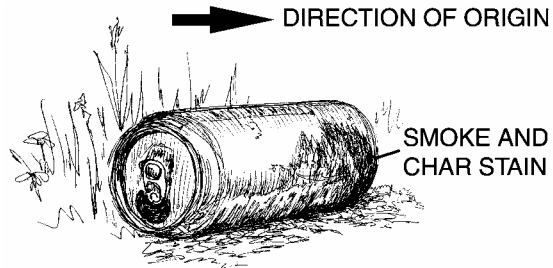


GRID BLOCK METHOD OF SEARCH.
SEARCH EACH BLOCK COMPLETELY.

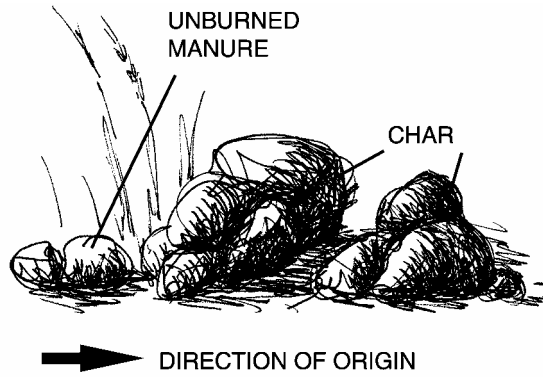
Fire moving uphill will usually defoliate the side away from the origin. Wind will force the flame to remain on the ground on the windward side but will allow them to get into the crown on the lee side.



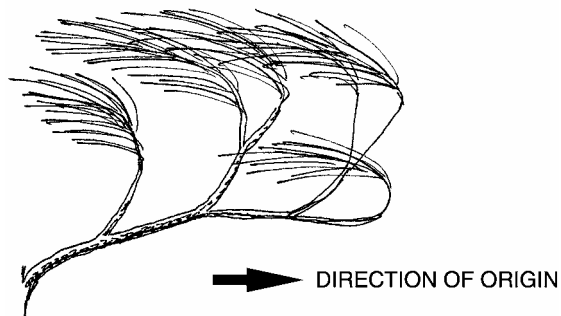
Tin cans will be stained with gases and heat on the side facing the point of origin. Unburned foliage may be found on the protected side.

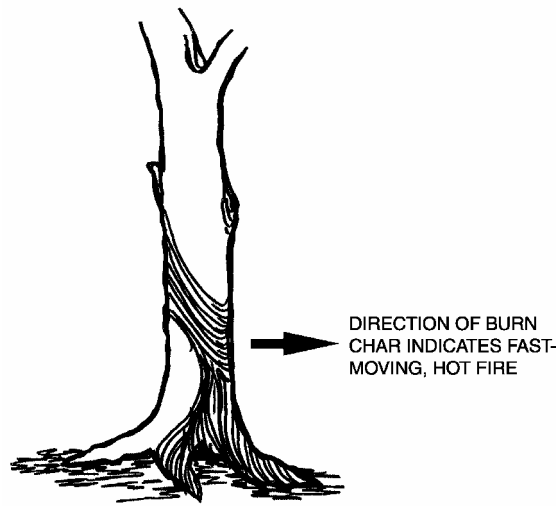


Manure will be scorched and have all debris burned away from the side facing the point of origin.

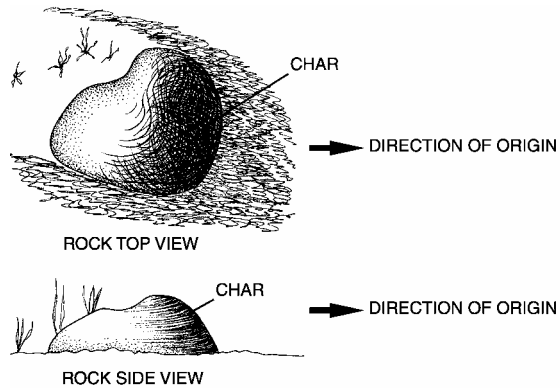


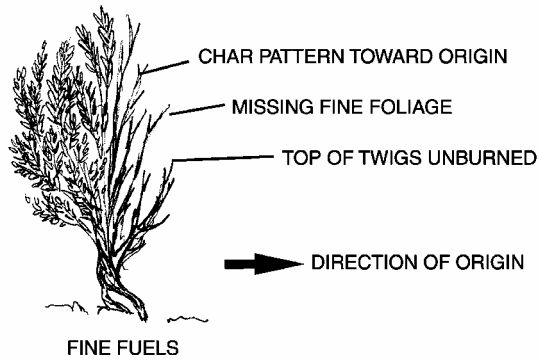
Pine needles will be at times heated to the point that the wind accompanying the fire will force them to point directly away from the point of origin. After cooling, they will remain in the configuration.



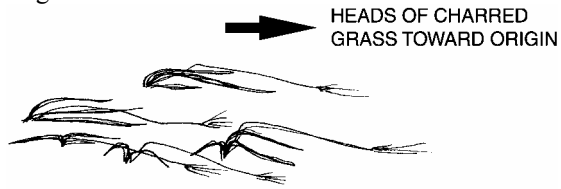


Trees and rocks, like everything else, will normally receive the most severe char on the side facing the origin. Often, debris and foliage can be found on the protected side.

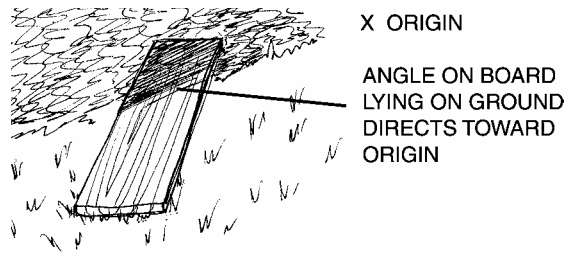




Smaller objects can help point out the origin. Small brush will usually be burned so that fine twigs are burned off on the side facing toward the origin.



Backing of fire into grass will often allow the grass to fall into the burned area. The heads of the grass will usually point to the origin.



Look for flat objects such as boards that are on the perimeter of the fire half in/half out. Fast-spreading fires may leave the angle that is a radial from the point of origin.

GENERAL PRINCIPLES FOR IDENTIFYING THE ORIGIN

- Fires start small and tend to burn with lower intensity at the origin areas. The majority of origins can be identified by areas of less damage.
- Many fires start along roads and trails. The origin area will usually be at a point close to the edge of the road or trail.
- Fires burning in homogenous fuels, on relatively flat terrain, with little or no wind influence will tend to burn in a roughly circular shape. The origin will be located more toward the center of the fire when this occurs.
- Fires burning with the wind or uphill will generally burn in a “V” shape while in the early stages. The origin will usually be within or very near the apex of the “V.”

- As the fire comes under the influence of wind, slope, or changes in the fuel type, it will form transition zones between the backing (heel), the lateral (flanks), and the advancing (head) areas that will surround the specific origin area. Look for differences in the overall indicators to identify these areas as outlined below:

- ✓ Advancing Fire (Head)

The advancing areas of the fire will be generally characterized by indicators of increased intensity and rate of spread, deeper charring, more white ash, more damage to foliage crowns, foliage freezing, an angle of char that is steeper than the slope, and a lack of grass stem indicators.

- ✓ Lateral Fire (Flanks)

The areas of lateral fire spread will be characterized by damage to combustible fuels that is generally at a 45- or 90-degree angle to the advancing areas of the fire. Fire damage overall will generally be less noticeable when compared to the advancing area. In grass fuels, a littering of unburned grass stems and/or seed heads may outline the flanks.

✓ Backing Fire (Heel)

The backing areas of the fire will be characterized by indicators of less intense fire that can include less charring, less white ash, minimal damage to foliage crowns, die-out patterns, an angle of char that is parallel to the slope, and grass stems and seed heads that are unburned and laying on the ground, pointing toward the origin.

