



**ORGANISATION AND
MANAGEMENT OF WILDFIRES**

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9.1 General Management

The fundamental principle of forest fire management is: regardless of the size of the fire, certain basic management principles are necessary to obtain prompt and efficient control of the fire with the smallest acceptable fire damage, and with reasonable cost.

The principles of fire management are the same for all fires, regardless of size.

Usually, the problems involved in controlling a wildfire become larger and more complex as the fire increases in size and the rate of spread increases. Therefore, the manpower, equipment, and apparatus must also increase, as must the number of specialists and section heads needed to handle the increased work loads of the several functions that would normally be administered by the fire chief.

Forest fire fighting is an emergency operation. To achieve success in the complex work of fire control, good organisation is needed, together with professional staff. Fire control management and organisation is similar to the military command structure, both being based on certain principles.

The two most important principles are:

- (i) unity of command; and
- (ii) span of control.

In order to achieve unity of command each person must have only one superior officer. The person must know to whom he reports, as well as who reports to him. The responsibilities of each person in a supervisory capacity must be clearly defined.

The second important principle is to avoid exceeding the span of control. There is a practical limit to the number of men or units of organisation that one person can effectively supervise.

Experience has shown that in general, one person is able to: supervise, direct, lead, or keep in effective control at one time a maximum of 6 - 8 persons.

Exceeding the span of control is a common fault. Another common fault is to send men to a fire site without clearly appointed duties or supervision.

Success in the initial attack on a small fire, or a successful strategy and the tactics employed on a large fire depends first of all on the fire chief. At small fires the fire chief can lead all the activities and all the crews. At large fires he must delegate duties and responsibilities to members of his staff.

Management of the forces used in a large fire requires experienced personnel, good command offices, and the minimum equipment of management, such as maps and communication systems. In any organisation there should only be one responsible fire chief, who should take all the decisions during suppression activities and delegate responsibilities clearly and in detail to his supervisory staff.

9.2 The Basic Requirements for a Fire Chief

The basic requirements for a fire chief are that the fire chief:

- (i) should have an excellent knowledge of forest fire behaviour, and all the factors affecting fire control;
- (ii) must have sufficient knowledge of fire suppression strategy, tactics, and techniques, and also be able to set up fire suppression time objectives;
- (iii) must be familiar with the practical use of all fire suppression equipment and techniques of application (including a working knowledge of the speed with which a fireline can be constructed using different types of equipment, under varying conditions and fuel types);
- (iv) must be able to organise and plan objectively under stress, and give confidence to his staff and crews;
- (v) must have full management experience of forest fire suppression;
- (vi) must be able to plan for the safety and welfare of staff at all times;
- (vii) must accept the authority and carry out duties assigned to a fire chief; and
- (viii) must be able to make decisions and give commands.

These same requirements, but on a smaller scale, are also valid for the other heads of divisions, sections, units, etc.

9.3 Management Procedures

In any fire situation the fire chief should go through a management procedure, or at least the principles of it. He must go through a shorter or longer procedure, depending on the size of the fire.

Large and long duration forest fires will include a lot of management procedures which will coordinate the many and various actions to be carried out during the fire.

The general management procedures can be divided clearly and logically, and are carried out in seven different phases.

Phase 1 - Fire reports that are received in the alarm centre or fire headquarters.

The fire report is the first information that the fire chief receives of the fire and he must start the fire suppression activities at this time. The more accurate the first report, the better will be the start of management.

Normally, the first report will include the following information:

- An accurate location of the fire (site, location on the map).
- The size of the fire (large, medium, small).
- The type of forest (fuel).
- The behaviour, type of fire (ground, surface, crown).
- Fire intensity, speed of spread.
- Access to the fire (roads, paths, topography).
- Water sources.
- Are there any people, residences, or structures in danger?
- Are there any people nearby who are available for fire suppression?

Phase 2 - Additional information on the fire conditions.

Many times, the fire report does not include all the necessary information. Therefore the fire chief should, immediately after receiving the report, try to get more information about the fire. More information can be obtained by studying maps, using the telephone, and so on. Additional information could include, among other things:

- What kind of forest, fuel, and topography is in the path of the fire?
- Are there any natural barriers or fuel breaks in front of the fire?
- What are the weather conditions and forecast?
- What is the speed of the fire?
- What are the positions of natural water sources?.
- Is there a civil organisation available for use in the fire suppression?

Phase 3 - Scouting the fire area.

This is what the fire chief normally finds out on arrival at the fire site.

The fire chief must scout, among other things:

- What are the largest risks and danger areas (lives, structures)?
- How far, and how quickly the head of the fire is spreading?
- Direction and speed of the wind.
- What type of forest fuel and topography is directly in front of the fire?
- Access in and around the fire area.

The principal objectives of scouting are to establish information on:

- (i) forest fires;
- (ii) forest, ground, and topography;
- (iii) weather;
- (iv) use of the crews and equipment; and
- (v) danger to lives and structures.

Scouting must be continuous and effective during the fire danger season.

Phase 4 - Appraisal of the situation

After receiving all the reports and scouted information on the fire, the fire chief must evaluate the strength of the fire and estimate his own manpower. Then the effectiveness of the suppression should be estimated. In this appraisal he should estimate, and / or know the:

- number of crews in use;
- experience and effectiveness of the crews;
- equipment and tools in use;
- usable water supplies;
- possibility of restricting and suppressing the fire;
- communication and management possibilities;
- possible scouting activities;
- supplies;

- order of importance of activities; and
- timing, and the estimated time for various activities.

Appraisal of the situation is an evaluation of the manpower available and the strength of the fire. The objective is to estimate the maximum and most important suppression effect against the fire with the manpower available.

Phase 5 - Decision

On the basis of the appraisal the fire chief must make, among others, decisions about the following:

- the activity goal;
- responsible areas, sections;
- suppression tactics and methods;
- the activity control centre;
- resources immediately in use, and any required additional resources to be dispatched;
- usable water sources;
- the management plan and organisation;
- communications;
- supplies; and
- reserves.

Decision is an attack plan. What will be the most optimistic and, on the other hand, realistic goal for fire suppression under the conditions?

Phase 6 - Commands to crews

Commands should be given so that the quickest and easiest work proceeds immediately. Later on, more commands can be issued for more precise work.

Commands to the fire crew should include information on the:

- state of affairs at the fire site;
- the main objective of the fire chief;
- command base of the fire chief;
- following up the work required; and
- suppression organisation, areas of responsibility, communications, supplies, etc.

The commands must include answers to the following:

- (i) Who? The objective of command.
- (ii) What? Which kind of job.
- (iii) Where? Which way.
- (iv) How? Techniques.

Phase 7 - Reserve crews

It is necessary to have a reserve force for every medium and large sized fire. The fire chief must establish the size and location of the reserve. If events of the fire are hazy the reserve

must be big enough to cope with the worst scenario. If the events of the fire are good and the fighting resources limited the reserve force need only be a small unit. The reserve unit must be able to move quickly to any place along the perimeter. Scouting and appraisal of the events must be continuous at the site of the fire because they are changing often and quickly.

9.4 Incident Command System (ICS)

9.4.1 Introduction

The Incident Command System (ICS) is used to manage an emergency incident or a non-emergency event. It can be used equally well for both small and large situations.

The system has considerable internal flexibility. It can grow or shrink to meet differing needs. This makes it a very cost-effective and efficient management system. The system can be applied to a wide variety of emergency and non-emergency situations.

9.4.2 ICS Organization

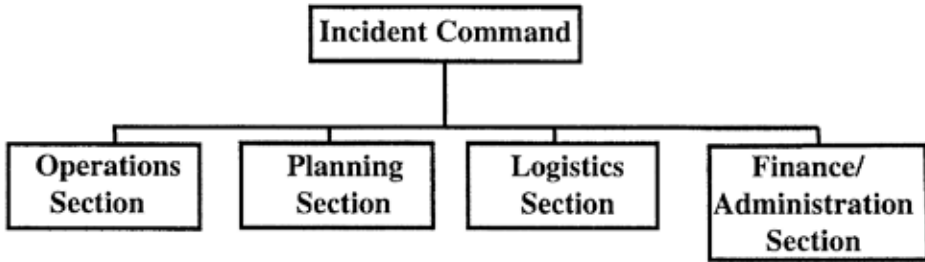
Every incident or event has certain major management activities or actions that must be performed. Even if the event is very small and only one or two people are involved, these activities will still always apply to some degree.

The organization of the Incident Command System is built around five major management activities. These are depicted in figure below.

<p><u>COMMAND</u> SETS OBJECTIVES AND PRIORITIES, HAS OVERALL RESPONSIBILITY AT THE INCIDENT OR EVENT</p>
<p><u>OPERATIONS</u> CONDUCTS TACTICAL OPERATIONS TO CARRY OUT THE PLAN DEVELOPS THE TACTICAL OBJECTIVES, ORGANIZATION, AND DIRECTS ALL RESOURCES</p>
<p><u>PLANNING</u> DEVELOPS THE ACTION PLAN TO ACCOMPLISH THE OBJECTIVES, COLLECTS AND EVALUATES INFORMATION, MAINTAINS RESOURCES STATUS</p>
<p><u>LOGISTICS</u> PROVIDES SUPPORT TO MEET INCIDENT NEEDS, PROVIDES RESOURCES AND ALL OTHER SERVICES NEEDED TO SUPPORT THE INCIDENT</p>
<p><u>FINANCE/ADMINISTRATION</u> MONITORS COSTS RELATED TO INCIDENT, PROVIDES ACCOUNTING, PROCUREMENT, TIME RECORDING, AND COST ANALYSES</p>

These five major management activities are the foundation upon which the ICS organization develops. They apply whether you are handling a routine emergency, organizing for a major event, or managing a major response to a disaster.

Small incidents: these major activities may all be managed by that one person, the Incident Commander (IC). Large incidents usually require that they be set up as separate Sections within the organization as shown in figure below.

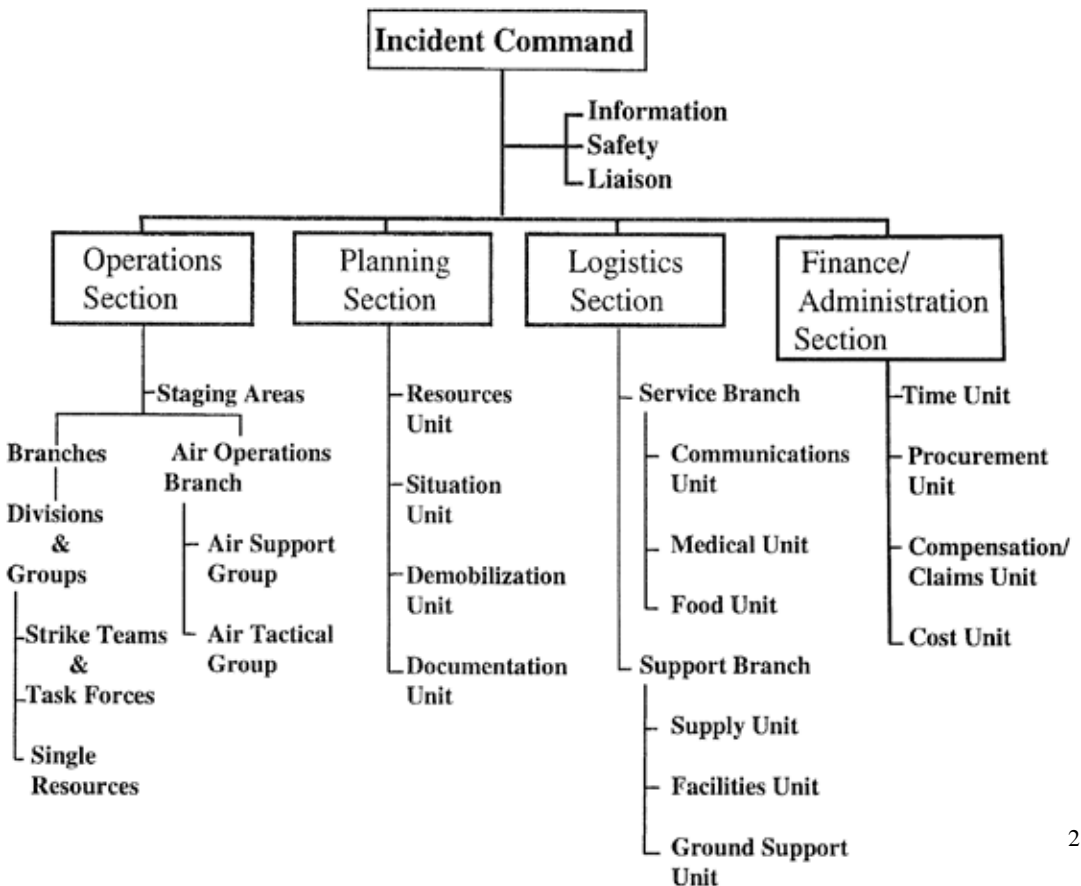


Each of the primary ICS Sections may be sub-divided as needed. The ICS organization has the capability to expand or contract to meet the needs of the incident.

A basic ICS operating guideline is that the person at the top of the organization is responsible until the authority is delegated to another person. Thus, on smaller situations where additional persons are not required, the Incident Commander (IC) will directly manage all aspects of the incident organization.

In the next section we will look at each of the major functional entities of the ICS organization, starting with the Incident Commander and the Command Staff.

9.4.3 Example of ICS staff requirements for a large fire



On potentially dangerous and rapidly spreading fires, the fire area becomes larger and larger, and the number of additional groups and crews will be required. These fires often involve a number of divisions because the perimeter of the fire is very long. Therefore it is necessary to add more levels to the Operations Section.

9.4.4 Incident Action Plan

Every incident must have an oral or written action plan, larger incidents always a written plan. The purpose of the plan is to provide all incident supervisory personnel with directions for future actions. Action plans which include the measurable tactical operations to be achieved are always prepared around a timeframe called an Operational period.

9.4.5 Span of Control

Span of control means how many organizational elements may be directly managed by another person. Maintaining adequate Span of Control throughout the ICS organization is very important. Effective Span of Control may vary from three to seven, and a ratio of one to five reporting elements is recommended.

9.5 Management Check-list for the Incident Commander or Fire Chief

One example of a check list to assist the IC or Fire Chief in the management of the work to be carried out with every wildland or forest fire is:

- (i.) Alarm, the first information at the start of a fire;
- (ii.) Arrival at the site of the fire, quick scouting and appraisal of the scene;
- (iii.) Appraisal of all the circumstances, and decision making;
- (iv.) Commands for the first operations;
- (v.) Continue with the scouting, for more information;
- (vi.) How to clear up, suppression plan takes shape;
- (vii.) Dealing with the work;
- (ix) Commands for the work;
- (x) Follow-up of the situation;
- (xi) Required additions to the organisation;
- (xii) Commands for the additional work;
- (xiii) Patrolling the work area;
- (xiv) Mopping-up;
- (xv) Removal of the organisation; and
- (xvi) Evaluation, collecting experiences.

9.6 A detailed list of “must follow up” activities

Preparation before the start of a fire includes:

- firelines;
- forest roads;
- planning;
- training;
- equipment care;
- assessing fire danger;
- fire weather forecasts; low, moderate, high, extreme;
- fire suppression organisation; the IC, fire chief, small, medium, large fires;
- fire service organisation; operation of the fire headquarters, supplies, transport, communication, accounts;
- maps and records;
- safety; and
- the district fire centre service organisation.

Leadership during the fire involves:

Formation of:

- The IC or the Fire Chief establishes the Incident Command Post (ICP) or command base;
- Staging areas
- Base
- Camps
- Helibase
- Helispot

Routine activities:

- scouting;
- rescue;
- restrictions;
- fire fighting.
- commands, order keeping; communications; maintenance of supplies; and
- information.

Control and maintenance during ongoing activities:

- patrols must be maintained; and water supplies should be replenished.

Activities after the incident or fire equipment and supplies should be:

- collected;
- checked;
- repaired; and
- returned to normal storage points.