FOREST FIRE MANAGEMENT PLAN

FOR

SUGUT CONSERVATION AREA

OCTOBER, 2015

It is hereby notified that in accordance with the Forest Enactment 1968, Forest Rule 1969, State Forest Policy and all other relevant laws currently in force, this Forest Fire Management Plan in respect of Sugut Conservation Area is approved for the period commencing from 1st October, 2015 to 30st September, 2024.

This Fire Management Plan is prepared by:

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SCA, Management Team

Dated: 27 OCT 2015

Approved by:

.....

(DATUK SAM MANNAN)
DIRECTOR OF FORESTRY

Dated: 27/10/2015

EXECUTIVE SUMMARY

Sugut conservation area (SCA) is situated in the north-eastern part of Sabah. It covers an area of about 8,535 hectares comprised mainly of Trusan Sugut Forest Reserves. It is a Class ll (Commercial) Forest Reserve, but due to its importance as wildlife refuge, it is vital that the area is managed as conservation purposes.

Conservation management plan (CMP) for the area has been prepared and it is now being aggressively implemented. However implementation of CMP is confronting several management issues which include forest fire issue. In view of that, Forest Fire Management Plan (FFMP) is necessary to be prepared as a guide for fire mitigation.

Therefore, this FFMP is prepared for SCA as a guide to the District Forestry Officer in managing fire. This FFMP is also prepared to comply with the requirements of all the relevant laws currently enforce.

In this plan, it includes the following:

(i) Description on the SCA in term of its geographic location, legal status, physical characteristic, biological and social environment.

(ii) Fire history, fire causes and the fire environment of the management area are also discussed in adequate detail.

(iii) Base on the area vulnerability to fire and its environment, several mitigation measures in respect to the fire causes are recommended such as:

a. To segregate the area into 4 zones according to the degree of difficulty in fire prevention and control,

b. Intensification of ground and patrolling in place of fire break establishment,
c. Establishment and operational guide of Fire Danger Rating System,
d. Establishment of fire observation tower,
e. Fire management organization and the general description of functions and responsibilities of the respective fire personnel,
f. The various types of essential equipment in fire suppression,
g. The approach to fire preparedness also highlighted, and
h. The several potential options to address the root cause of fire problem are identified.

(iv) Finally, the fire prevention and control strategies which provide a sequential approach in fire mitigation are prescribed with a brief guideline in fire suppression technique.

This FFMP is by no mean exhaustive. It is because the implementation of FMP is still being aggressively pursued. In view of this, the FFMP may need to be reviewed from time to time to suit the changes in the fire environment arising from planned forest management activities implementation.

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1.0 INTRODUCTION

The State Government is committed to place the entire area of Forest Reserves under sustainable forest management (SFM). Where, areas classified under Class ll Forest Reserves which are subjected to commercial harvesting of timber, comprehensive medium term Forest Management Plan need to be prepared. The bold commitment was launched in 1997 that stimulated the adoption of the sustainable forest management concept into the management of forest resources of Sabah. While other areas which are set aside for other purpose such as conservation, a Conservation Management Plan is to be prepared. To facilitate the effort towards achieving the objective, the area of Forest Reserves has been divided into several forest management units (FMU), which covers an area ranges from 1,000 hectares to 100,000 hectares. To date, with the participation of private sector and other parties comprised local, national and international, many of the FMUs are already in advance stage of SFM implementation.

The task of implementing SFM through conservation approach in Sugut FR is complex. This is due to the fact that besides dealing with different forest type namely lowland dipterocarp forest, peat swamp forest and mangrove forest, it is also confronted with the emerging forest fire problem which has an impact far more destructive than conventional logging activities. Simply because the destruction due to forest fire is catastrophic in nature whereby all life form in the affected area are completely wiped out.

Prior to the major fire in 1983, forest fire was perceived not a pressing issue in forest management in Sabah. But the eventful year that saw about a million hectares of forest area destroyed, marked a drastic change of perception toward the issue. The massive area of forest destroyed has provided a clear evident that fire can indeed inflict massive and severe destruction to forest resources. As the occurrence of forest fire become more frequent and the severe destruction caused whenever it’s happened, fire has since been regarded as one of the important forest management issues that need to be dealt with accordingly.

Based on the observation records, most prone areas to fire are logged over forests and forest plantation. High accumulation of fuel arising from logging debris in log over areas and high accumulation of litter in forest plantation make them highly flammable during drought season.

Majority of the forest fire incidents in Sabah are caused by human activities such as land clearing for subsistence farming by local communities, agriculture land development, hunters and to some extent by arson. Thus, forest areas adjacent to human settlements, agriculture lands and expose to general public are very vulnerable to fire.

Generally, Sugut Conservation Area (SCA) has been subjected to timber harvesting. Logging residues made up of wood debris may have been accumulated and left out in abundance. During drought season it becomes flammable fuel that could turn SCA highly susceptible to fire. As fire could cause catastrophic impact on forest resources, it is imperative that forest fire management plan (FFMP) be prepared to serve as a strategic guide to District Forestry Officer of Beluran in fire prevention and control.

2. OBJECTIVES AND POLICY STATEMENT

The subject matter contained in this FFMP is its objectives and policy statement defining the prime purposes of its formulation.

2.1 Objectives

The objective of the FFMP is to provide direction for operational planning at the field level namely, infrastructure development, resource allocation, training, monitoring and control program, with the ultimate goal to reduce the risks and occurrences of fire.

The plan also serves as a guide under which individual activities shall be developed and implemented. It shall be reviewed from time to time to suit the actual ground operating conditions and to include any new management activities.

The specific objectives of the Fire Management Plan are:

- To provide measures to prevent and control fire in the SCA,
- To provide a blueprint for planning of fire management operations at the field level,
- To provide a guide for preparing fire management activities and their schedule, to be carried out within the specific fire management zones identified in the area,
- To provide basis for resource (both manpower and budget) planning and organization for maximum productivity and high success rate to meet the target set in a timely and efficient fashion,
- To effectively and efficiently utilize the resources allocated and to gain the full benefits of all resources allocated.

2.2 Policy Statement

The Fire Management Plan corresponds with the following actions:

- Compliance to the State Government Policy, Rules and principle governing the management of state forest resources.,
- Compliance to all relevant fire management principles, fire enactments, policies, rules and procedures;
- Relevant fire action programs of the State of Sabah;
- Close working relationship with adjacent landowners and other stakeholders in the management of fire, including continuous training, drills and consultative meetings;
- Continuous development and refinement of techniques in managing fire in the SCA;
- Deployment and or employment of adequately trained personnel to handle fire.

3. GENERAL INFORMATION OF SUGUT CONSERVATION AREA

3.1 Location and Legal Status

Sugut Forest Reserve is located in the north eastern part of Sabah between longitude 117^0 35' E and 117^0 43' E and between latitude 6^0 18' N and 6^0 26' N (see Figure 1).

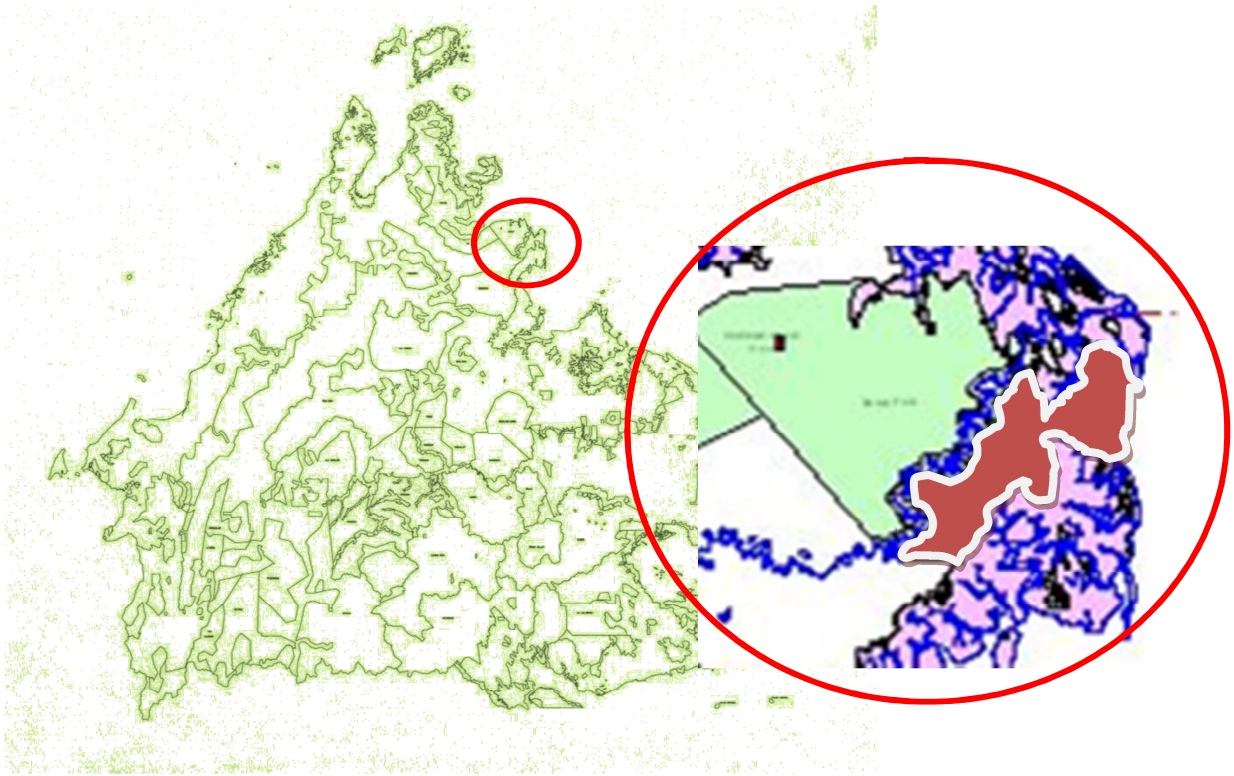


Figure 1: Location Map of Sugut Conservation Area

SCA is made up of entire area of TrusanSugut Forest Reserve which covers approximately 8,535 hectares. The whole area is under Class II which was set aside for conservation purposes.

3.2 Physical Environment

3.2.1 Climate

Sabah experiences a wet tropical climate that is largely controlled by the Indo-Australian monsoon system. In general, northerly winds occur from December to March that brings rains to the east coast of Sabah, and winds from the southwest dominate from May to October which brings rains to the west coast. During the transitional months, around the equinoxes, winds tend to be light and variable. Usually, during the transitional months, precipitation is less than normal and under extreme conditions, it manifests into seasonal droughts.

Rainfall

Geographically, SCA is located at the coastal area in the east coast of Sabah. Therefore, it has a rainfall pattern that is under the influence of the northeast rainfall regime of which the maximum rainfall occurs during January while the minimum rainfall occurs in April. Under this regime, much of the rainfall is received during the northeast monsoon months of December to March.

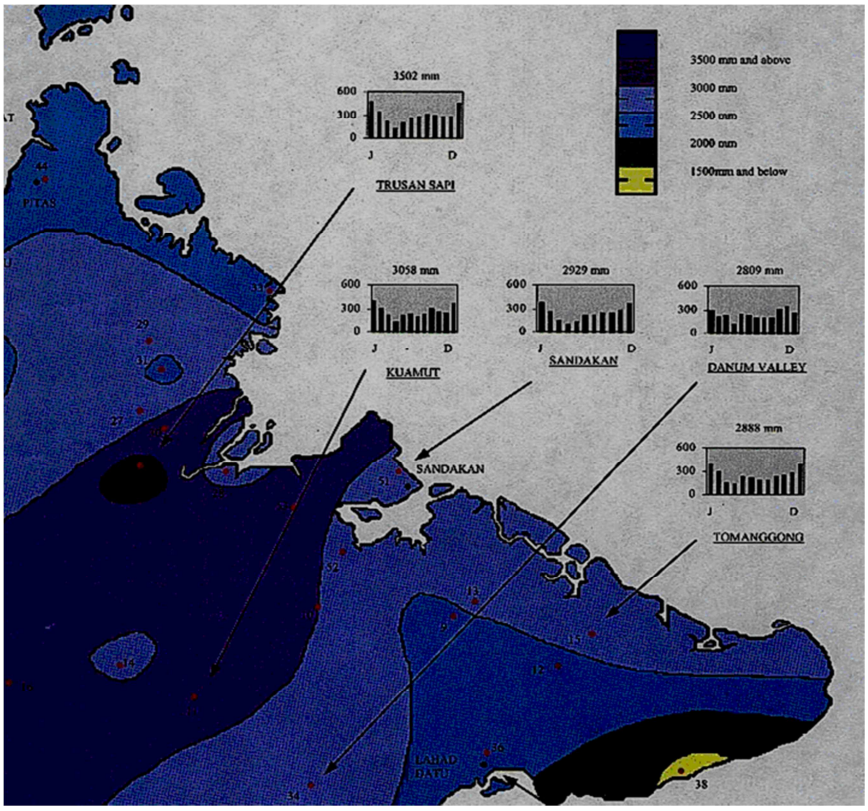
However, due to lack of rainfall data collected within the project site, rainfall data collected at Pamol Estate has been used to estimate the amount of rainfall received within the project site. As shown in Table 1, the project site received between 2,600 mm to 3,800 mm total rainfall annually. Also from the state-wide rainfall pattern distribution indicates that SCA is within rainfall belt that receive 2,500 mm and 3,000 mm annual total precipitation as can be visualized in Figure 2. Though SCA receives high amount of rainfall in general, an irregular pattern is evident as shown in Figure 3. Where, significantly low rainfall occurs in the month of April and excessively high rainfall is received in the month of December.

Table 1: Monthly and Annual Total.

Month	Year						5-year Average
	2000	2001	2002	2003	2004	2005	
Jan	489.7	205.2	337.2	427.8	336.1	215.7	335.3
Feb	372.5	450.2	282.0	128.6	248.0	33.3	252.4
Mar	352.0	608.3	196.0	436.4	118.3	238.1	324.8
Apr	155.1	192.3	85.1	37.8	91.4	25.3	97.8
May	100.0	200.2	273.3	165.2	346.3	271.1	226.0
June	119.3	173.7	329.7	330.0	195.2	363.8	251.9
July	116.6	410.6	171.4	193.1	498.9	160.2	258.5
Aug	185.0	224.9	345.8	255.6	120.2	240.9	228.7
Sept	276.6	236.1	323.6	366.8	272.6	276.7	292.1
Oct	326.1	384.8	229.8	390.6	173.7	249.6	292.4
Nov	253.0	299.0	184.8	80.0	218.0	299.7	222.4
Dec	218.7	417.8	381.9	1167.6	594.1	310.7	515.1
TOTAL	2,964.6	3,803.1	3,140.6	3,979.5	3,210.8	2,685.1	3297.3

Temperature

Based on the air temperature record that was obtained from the Pamol estate showed that the air temperature pattern within the region covering SCA is uniform throughout the year. The average annual temperature is 27 °C, with an average maximum of 31°C and minimum 23°C. However, it does indicate some threshold of high temperature readings which are associated with the dry season that normally occurs during the months of the inter monsoon period.



Source: Forestry Department

Figure 2: Rainfall Patterninthe Northeast Sabah.

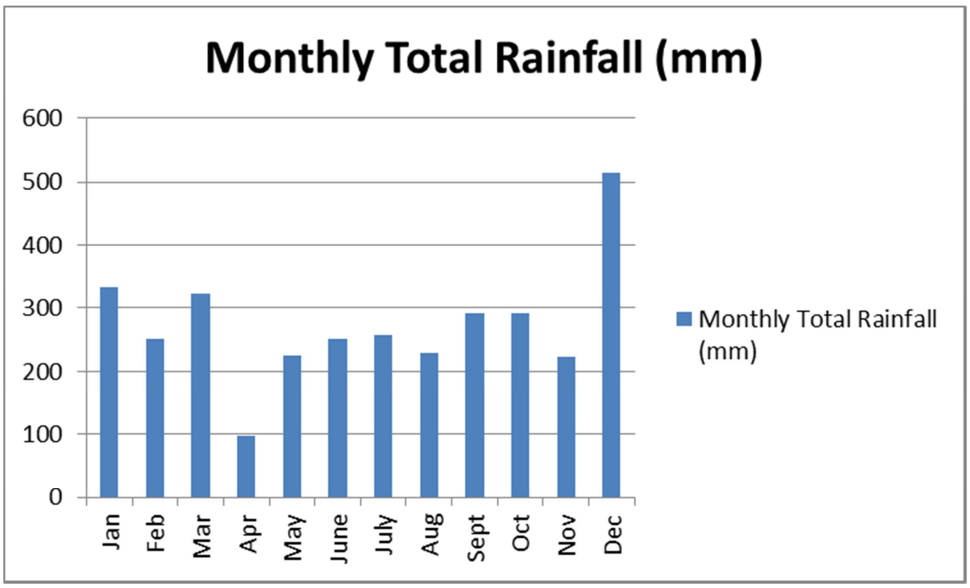


Figure 3: Graphical Pattern of Monthly Total Rainfall

3.2.2 Topography

The general landform pattern of SCA is characterized mainly by its flat Physical landscape. Only about 25 percent are of high elevation which peaked at approximately 135 meters above sea level. Other areas are having elevation between 0 to 20 meters above sea level. The spatial distribution of landform pattern is shown on the map in **Figure 4.**

3.2.3 Hydrology

There are two major rivers draining SCA area. They are Sg. Sugut, which drain the western part of SCA and Sungai Poroi which originate from the central part and flows to the north of SCA. On the eastern side of the SCA, there are several rivers appear to be originated from the SCA. All these rivers serve a very important access to the SCA and its surrounding, **Figure 5**.

3.2.4 Vegetation

The natural vegetation within SCA can be categorized into three distinct types namely Mangrove, Peat Swamp and Hill Forest. Logging activities to some extend has changed the natural forest structure into primary and secondary forests. Nevertheless, based on satellite imagery interpretation the general forest cover can be stratified into 4 different strata such as small crown, stratum 4, stratum 5 and swamp. The spatial distribution of forest strata is given in **Figure 6**.

3.2.5 Fauna

Though SCA has been subjected to multiple logging, it is still harbouring multitude number of wildlife species ranges from tiny size to big mammals and it was reported that tembadau is frequently sighted which suggest this mammal species is thriving in the SCA. Elusive primate species such as Orang Utan and gibbon are also found in fair significant population. In view of this SCA is an important habitat for wildlife in the northeastern part of Sabah. Thus, it needs to be protected from catastrophic impairment.

3.3 Infrastructure

3.3.1 Building

The existing building infrastructures in SCA comprised of Field Administration building, staff quarters, Forest fire fighting equipment store and water transport and accessories store.

3.3.2 Road

In term of access, SCA area is also accessible by road. The road leading to the area is connected to the major Sapi-Kanibongan road and passing through some oil palm estates. However, road network within the SCA is very much limited, **Figure 7**. The limited road network within the SCA serves a very important challenge in implementing forest management activities. Similarly, when effecting forest fire management, obviously it is grossly inadequate for fire prevention and suppression purposes.

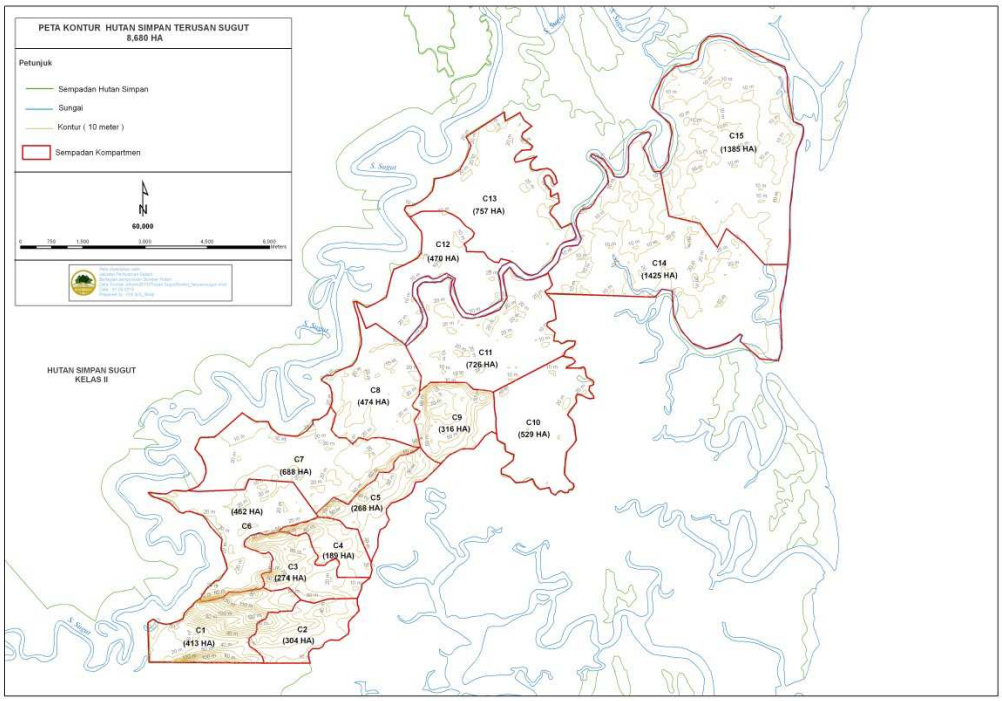


Figure 4: Topographic Map of Sugut Conservation Area.

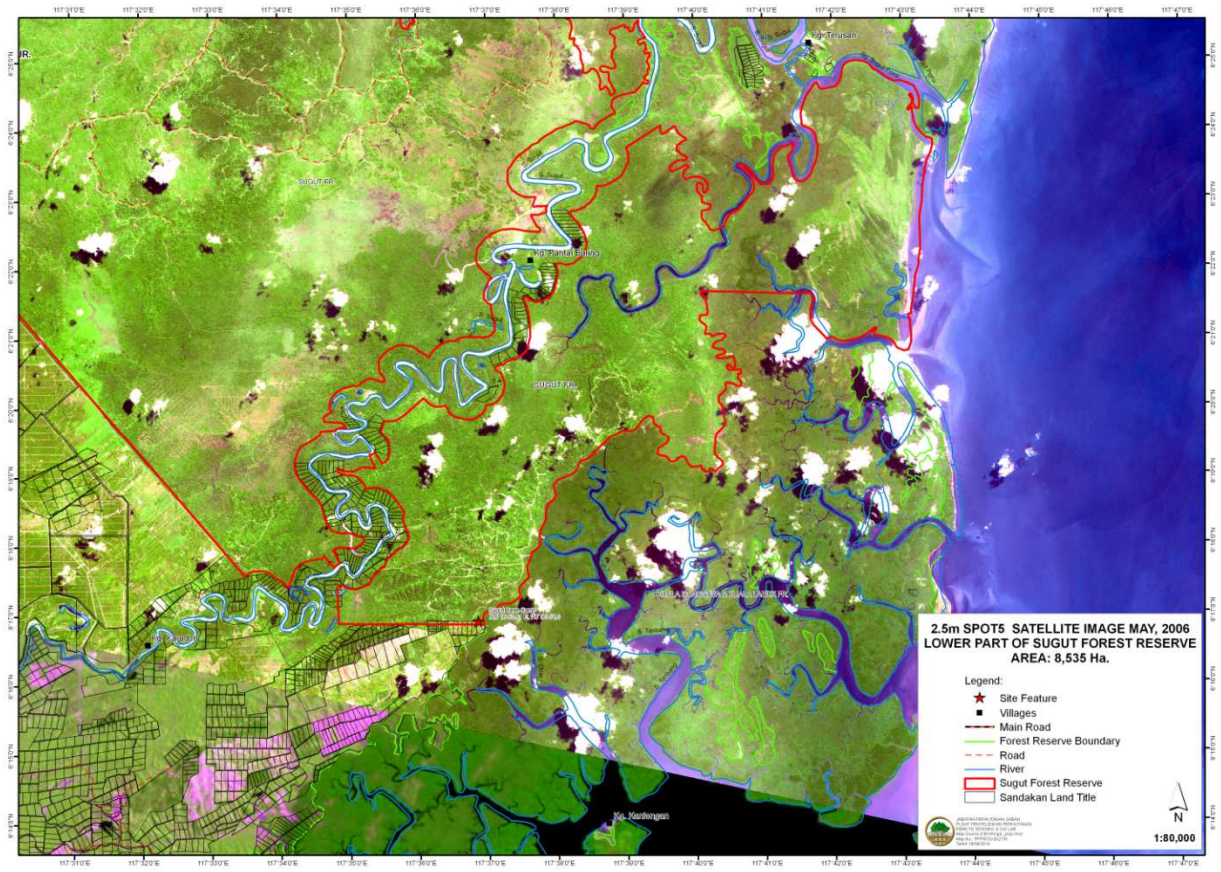


Figure 5: Major Rivers within Sugut Conservation Area.

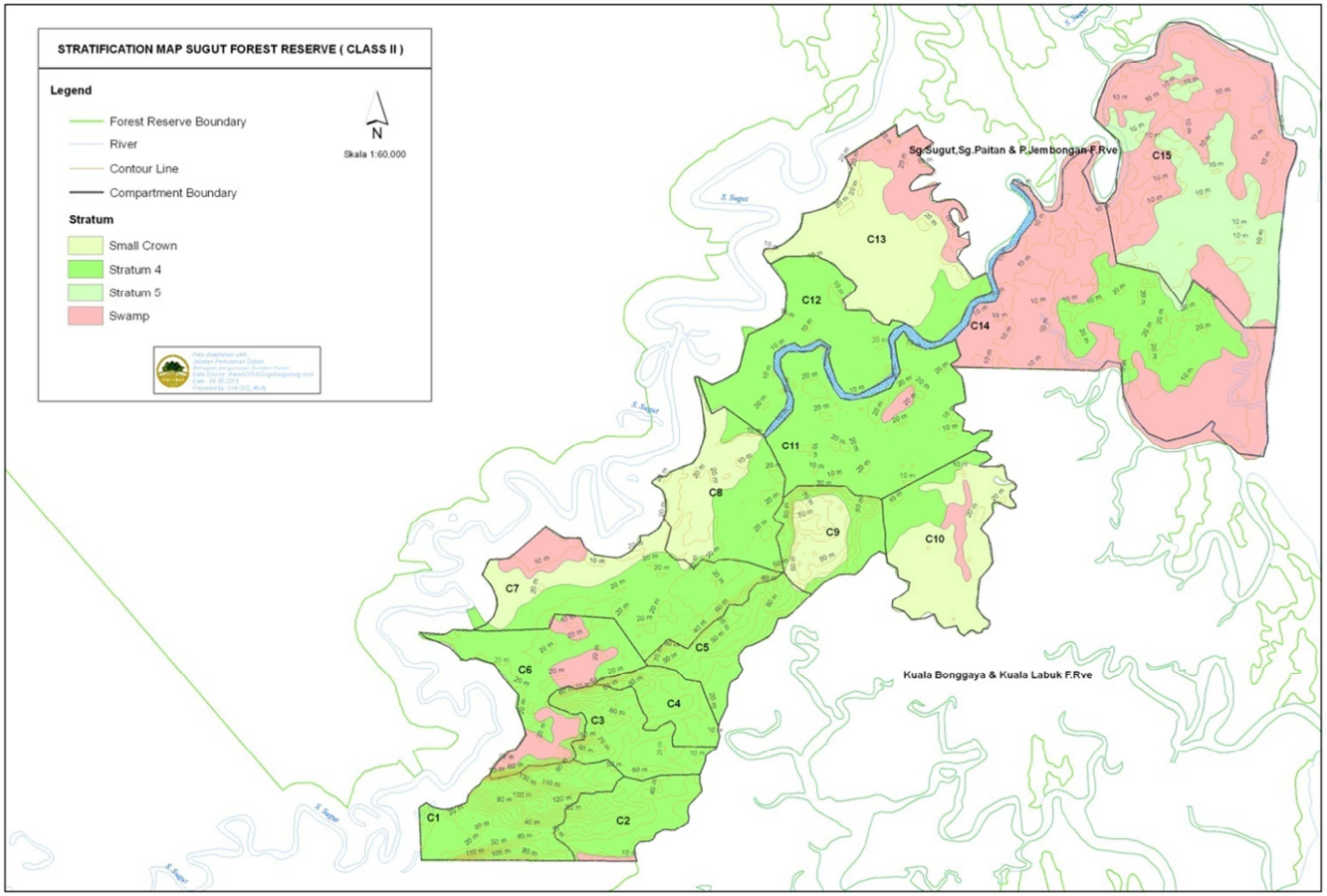


Figure 6: Forest Stratification Map of Sugut Conservation Area.

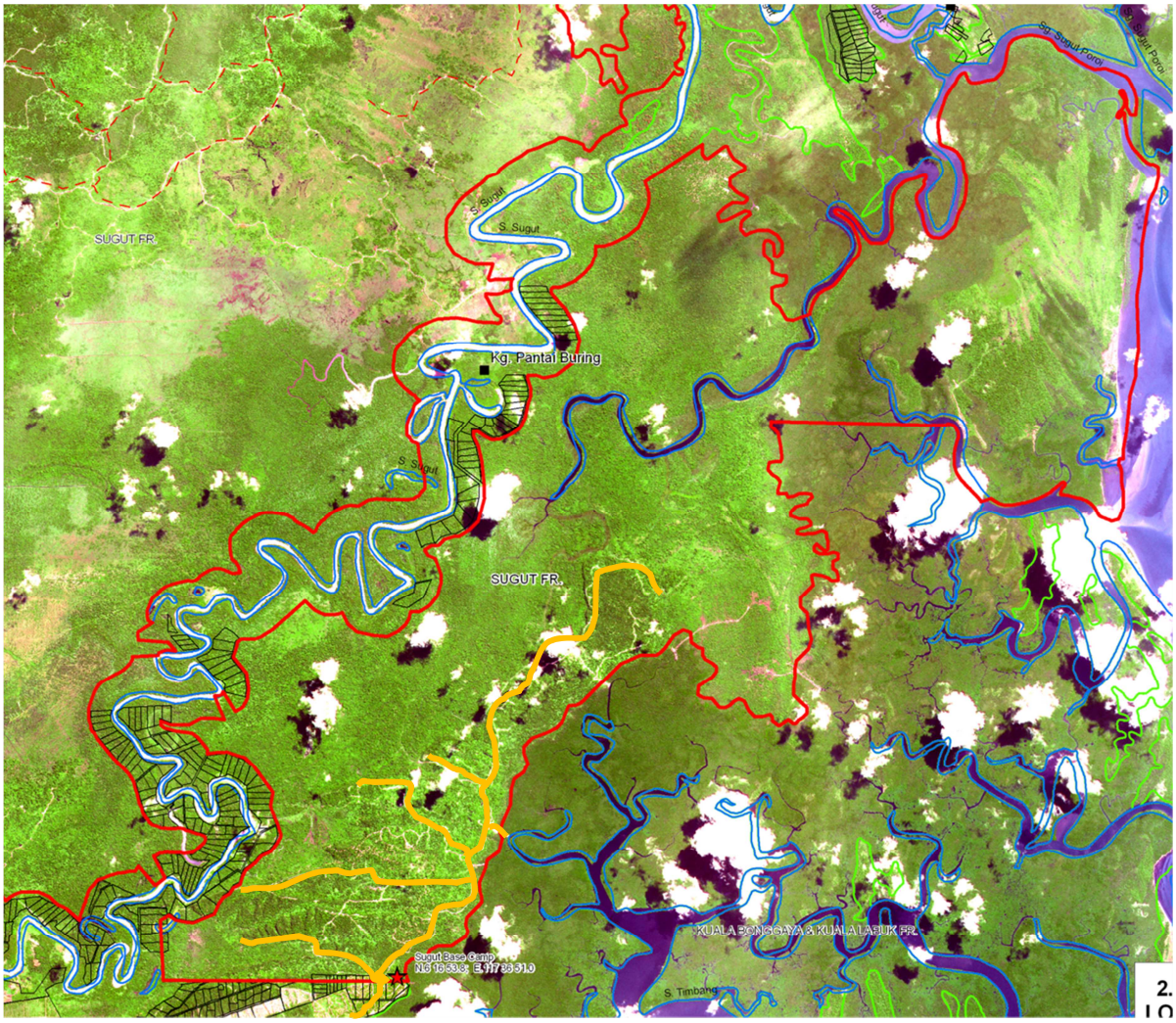


Figure 7: Road Network

3.4 Local Communities

There are 4 long-standing villages located around SCA. These villages are Kg. PantaiBuring, Kg. Terusan, Kg. Kaniogan and Kg. Tagahan. According to the baseline survey report, these villages have been in existence since over several decades ago.

Being an established village, each village is administered by a village chief and a Chairman of Development and Security Committee (JawatankuasaKemajuandanKeselamatan Kampong –JKKK). The demographic distribution of these villages is shown on the Map in **Figure 8**.

Figure 8: Adjacent Community Villages

3.5 Fire History of Sugut Conservation Area

After El-Nino induced drought in 1983 which caused widespread forest fire in Sabah, similar catastrophic event occurred in 1998. It caused damage to about 190,000 hectares of Forest Reserves. Many of the affected areas are badly damaged while others are completely destroyed. Amongst the Forest Reserves affected was TrusanSugut Forest Reserve which made up the SCA, Figure 9. Meanwhile, the extent of damage in term of area is given in Table 2.

3.5 Fire Causes

Base on field observation reports, fire occurrences are generally associated with human activities. But there are fire cases reported due to arson. Human activities that have significant role in fires occurrence

are land development, shifting cultivation, hunting and recreational activities as shown in Table 2. Of these identified fire causes in Sabah, hunting probably responsible for the fire occurrence in SCA. It is because the site where the fire occurred is located away from human settlement and it is generally known that villagers nearby used to hunt wildlife for their household consumption.

Table 2: Area Affected According to Causative Agents

YEAR		CAUSES OF FIRE					
		Adjacent Land Development	**Shifting Cultivation**	**Hunting**	**Arson**	**Recreation**	**Unknown**
1992	Number of Fire Incident	3	1	2	2	2	-
	Area Affected (Ha)	3,624	300	1,000	11	50	-
1998	Number of Fire Incident	7	5	8	9	1	-
	Area Affected (Ha)	50,673	63,168	25,898	2,241	120	49,766
2000	Number of Fire Incident	6	8	5	2	3	-
	Area Affected (Ha)	5,860	8,410	5,750	140	100	-
2001	Number of Fire Incident	3	-	2	-	-	-
	Area Affected (Ha)	200	-	600	-	-	-
2002	Number of Fire Incident	5	2	4	1	1	-
	Area Affected (Ha)	1,692	1,755	1,660	1	1	
2003	Number of Fire Incident	2	2	3	-	-	-
	Area Affected (Ha)	506	106	3,050	-	-	-
2004	Number of Fire Incident	1	-	2	1	-	-
	Area Affected (Ha)	1.5	5	-	151	5	-
2005	Number of Fire Incident	4	2	2	-	1	-
	Area Affected (Ha)	944.5	342.5	9.85	-	0.41	-

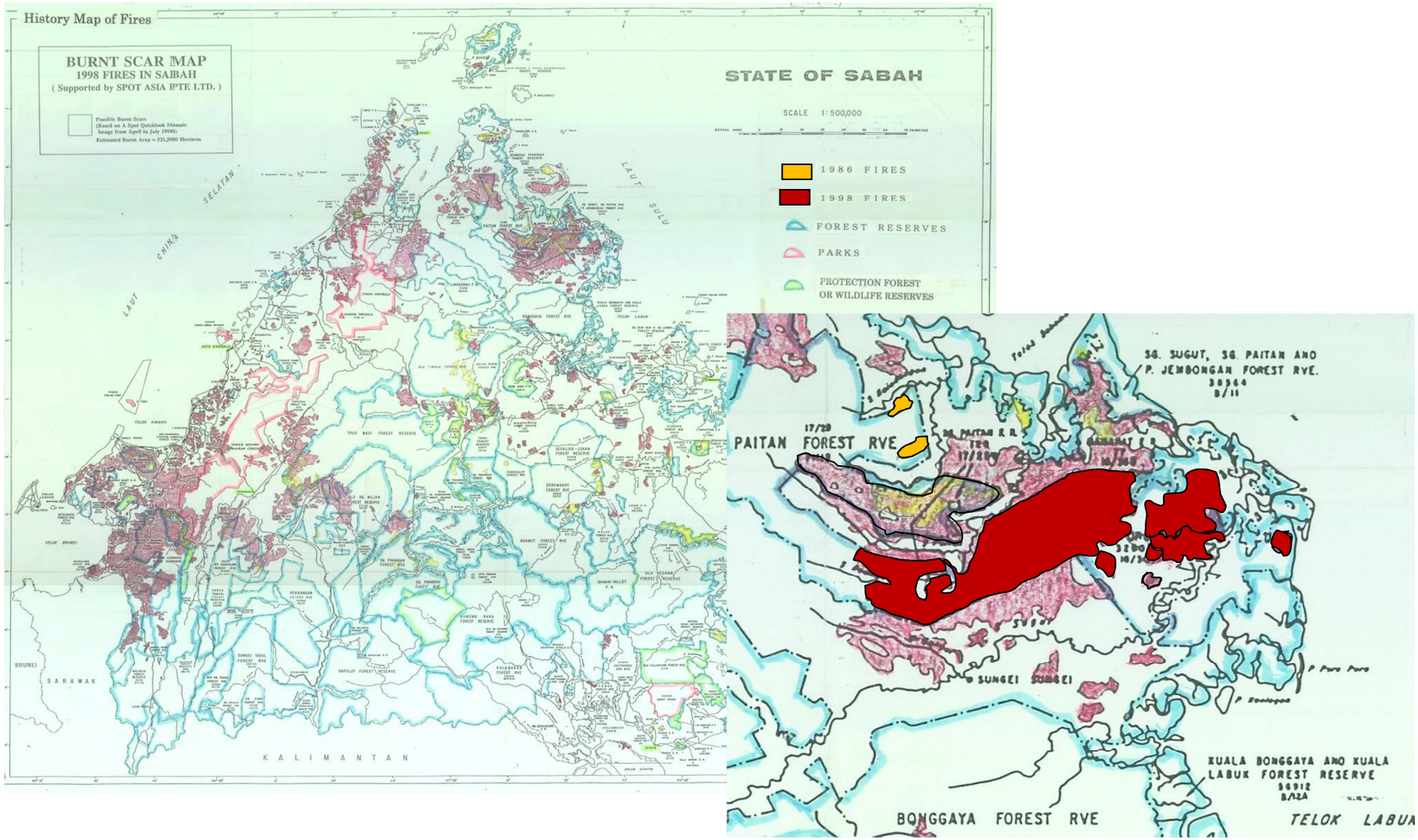


Figure 9: Map of the Burnt Area

3.7 Fire Environment

In term of fire risk, SCA is within a low fire risk zone, as can be depicted from the state wide map of fire risk zone in **Figure 10**. This suggests that the area is less susceptible to fire. But under extreme weather condition the area may become highly flammable due to the nature of the other attributes of its fire environment.

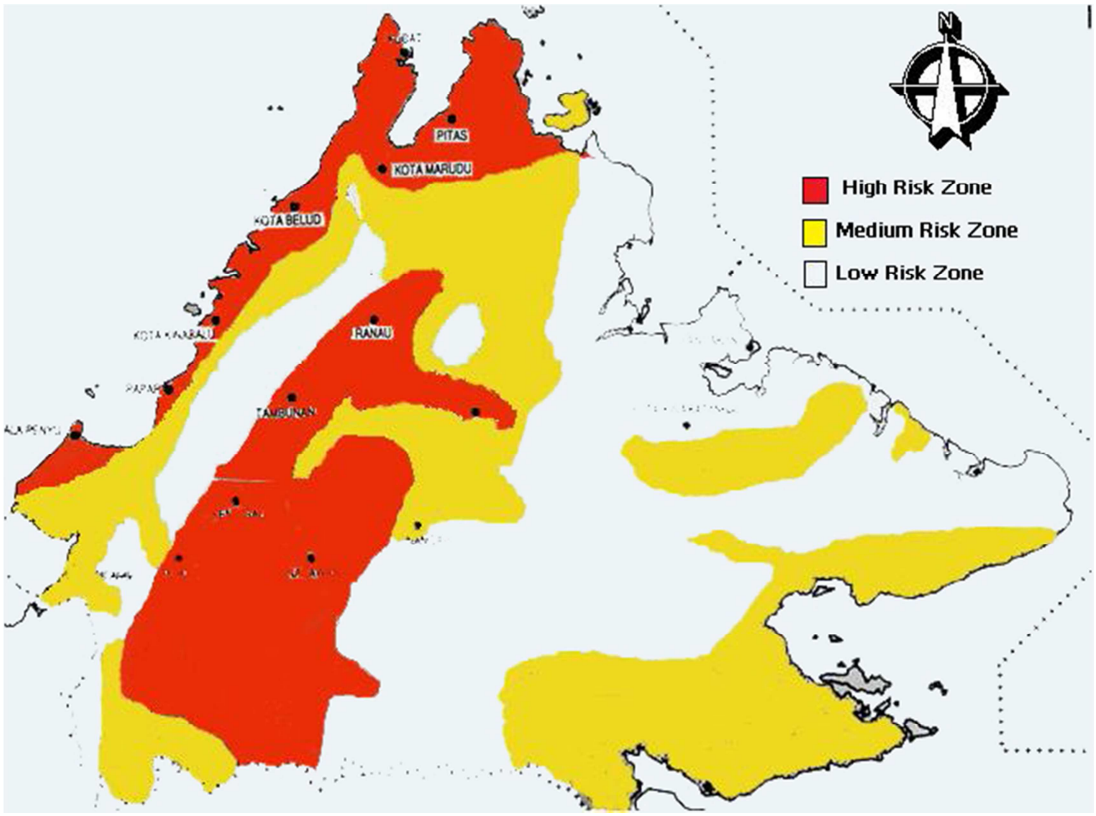


Figure 10: Map of Fire Risk Zones

Therefore, SCA fire environment is the most important factor to be considered if any strategy formulated for its fire management to be workable and effective. The 3 main key factors contributing to fire environment are:

a) Fuel types,

b) Weather, and

c) Topography.

3.7.1 Fuel Types

Fuel types "govern how fast a particular vegetative area dries out, ignites and burns". The term "fuel type" is defined as "an identified association of fuel elements of distinctive species, form, size, arrangement and continuity that will exhibit characteristic fire behaviour under defined burning conditions" (Merrill and Alexander 1987). The general fuel landscape of SCA can be visualized from the photograph in Figure 11.

Based on study conducted by the State Forestry Department, the fuel classification system for Sabah has been designed to group vegetation types that are likely to exhibit similar fire behaviour characteristics. There is currently 5 fuel type classes identified for Sabah, namely:

a) Grassland

b) Slash

c) Disturbed Forest

d) Plantations, and

e) Original Forest.

Figure 11: Vegetation Cover of Sugut Conservation Area

There is still a need to study the fire behaviour characteristics, suppression difficulties and fire effects for each fuel type (Sabah Forestry Department, Forest Fire Prevention and Control Manual). However, for SCA it is sufficient to identify the presence of each fuel type within the SCA and also surrounding areas.

a) Grass and Scrublands

This fuel type is characterized by continuous grass (15+t/ha) cover or shrubs, where the number of occasional trees does not affect fire behaviour appreciably. Lalang (*Imperata cylindrical*) and shrubs rapidly invades disturbed areas and former agricultural land, forms a dense, continuous fuel bed in which dead material accumulates rapidly (Pickford *et. Al.*1992).

Detailed field assessment of this fuel type was not conducted. However, brief field observations suggest that there is substantial size of sites or patches of land within SCA that qualify for this category at the time of this FFMP formulation.

b) Slash

This fuel type is comprised of the leaf litter, twigs, branches and woody material or debris that is created as a result of felling, slashing, girdling or logging. Brief field observation suggests that its presence can be found in areas recently under harvesting operation.

c) Plantations

In areas subjected to intensive forest restoration could resemble that of forest plantation area thus very much susceptible to fire. This is due to the fact that thick woody vegetation and creepers usually colonized in any open space, and are continuous throughout the restored area.

3.7.2 Weather

Weather is one of the site factors that govern the degree of flammability of a particular area. Though SCA is generally receiving high amount of annual rainfall, which laterally translate that the area is less susceptible to fire occurrence, but looking back to its fire history, the area is indeed very much susceptible to fire. Furthermore, the present of significant area with open forest condition, promote rapid rate of desiccation thus making fuel drying process increase and eventually transform the area into highly flammable.

3.7.3 Topography

Topography plays an important role in fire behaviour as it influences wind direction and velocity. In flat areas wind direction is not impeded, while in hilly terrain, gush of wind may be experienced as an overdraft, which will have effects on fire behaviour.

In order to come up with a comprehensive analysis of the fire environment in SCA, a detailed study may necessarily be conducted to observe the weather, fuel loads and topography at a micro-site level. However, for the purpose of this FFMP, in the absence of detailed data, the fire environment has been based on existing available secondary information at a macro level. Based on the information (current status of the land use in SCA), a preliminary analysis of the fire environment suggests the following:

a) The fire environment of SCA may be potentially dangerous, especially during severe drought, not because the fuel can ignite by natural causes, but due to the presence of hunting activities that imminently make bone fire which may get out of control.

b) The fire environment in the adjacent lands is potentially hazardous, especially in areas bordering with oil palm plantation at the southern boundary. The oil palm workers without due regard to it consequence may set fire during their afternoon break for comfort. In dry season this may inadvertent could cause fire in the SCA if such practice is carried out near the common boundary.

4. FIRE MANAGEMENT

4.1 Zoning

The main purpose of zoning is to divide the area according to the degree of difficulties in suppressing and controlling fire so that appropriate strategies to deal with the problems can be drawn accordingly. Zoning also provide effectiveness of both fire tower and ground patrol reporting, thus facilitate central command to strategize and dispatch fire suppression Team.

For zoning process, various essential factors that need to be considered are fuel load, topography, accessibility, internal road network, remoteness and availability of permanent water bodies. Based on these factors, FMU SCA can be divided into four (4) fire management zones as shown on the map in Figure 12. Tabulated description of each zone is given in Table 3.

Table 3: Fire Management Zones

Zone	Topography	Internal Road Network	Location From Central Command	Degree of Difficulty
1	Relatively hilly	Good density of accessible road network	Within reach of Base camp	1
2	Relatively Flat and low elevation	Poor density of accessible road	Some distance from the Base Camp	2
3	Flat and Low elevation	Less accessible	Far distance from Base Camp	3
4	Flat and Low elevation	Less accessible	Very far from the Base Camp	3

Note: 1 – Less Difficult, 2 – Moderately Difficult, 3 – Difficult,

However, the zones are not static and may be redefined or changed depending upon the practicability on the ground.

On the other hand, preparedness in fire prevention and control for the respective zone to be done in accordance with the level of difficulty. For instance, in respect to level 3 Zone more emphasis should be given on fire prevention and early detection through fire tower observation, ground patrolling and also hot spot monitoring. While for other zones fire tower observation and occasional ground patrolling would be sufficient.

4.2 Ground Patrol

The most vulnerable areas in SCA are those compartments bordering oil palm plantation and compartment where Kg Tagahan is situated. In term of fire vulnerability, these compartments can be categorized into high risk and low risk areas as shown on the map in Figure 13. The high risk compartments are those along the western boundary as they

are more exposed to illegal encroachment by any individual through Sg. Sugut especially for wildlife hunting. However, the vulnerability level in respect to villagers' activities of Kg. Tagahan need to be further assessed.

Therefore, intensive ground patrolling must be carried out for the compartments along western boundary and other compartments exposed to significant threat from illegal hunters. In addition, it must be supplemented by constant observation from fire tower.

For the moderate risk category, ground surveillance and remote monitoring through fire tower would be adequate.

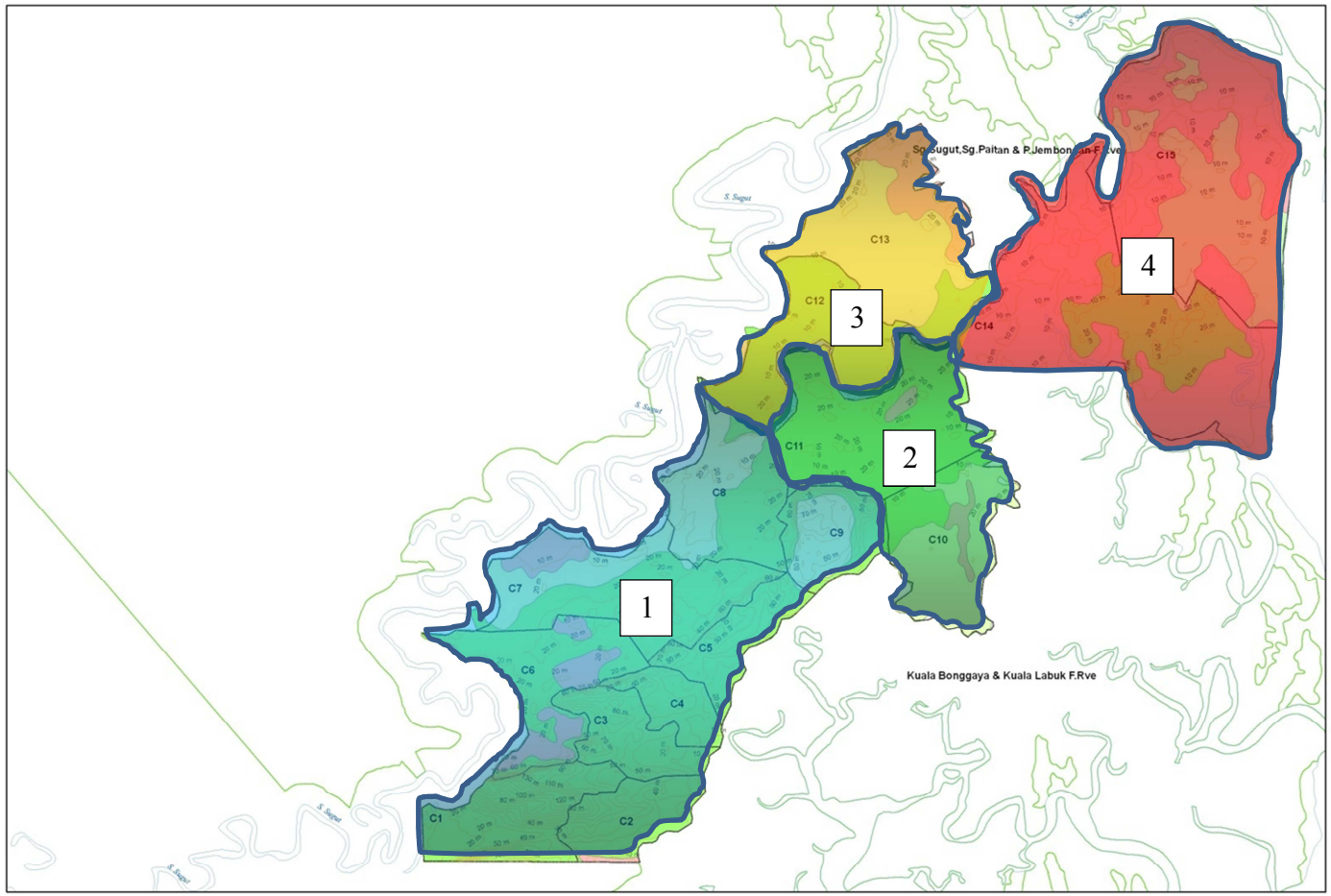


Figure 12: Fire Management Zones

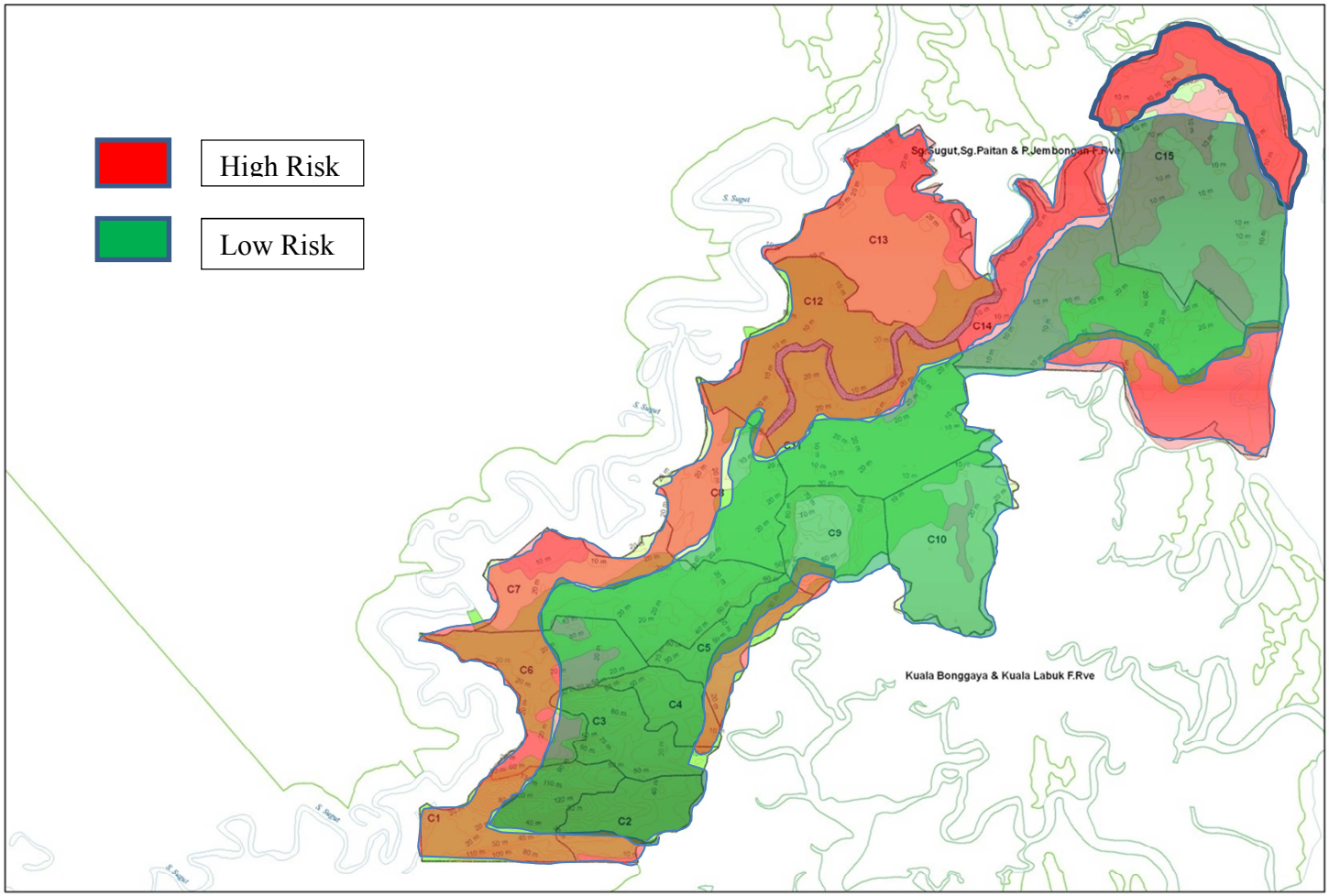


Figure 13: Compartment under High Risk

4.3 Fire Tower

Small fire is easy to control and extinguish. Thus, early detection is very important. There are many ways to carry out early detections; they include frequent ground patrolling to the high risk areas, hot spot imagery obtained from weather satellites such as NOAA satellite and through fire observation tower. The three options are essential for SCA for the purpose of early detection.

For fire tower establishment, one tower is to be established in a strategic location. The proposed site for the tower establishment is at the summit of Bukit Fidelis as indicated on the map in **Figure 14.** To make the observation tower effective, it observation platform is going to be erected higher than the emergence level and it is to be built on high elevation so that it has a 360 degrees coverage. A typical fire observation tower isshown in **Figure 15**.

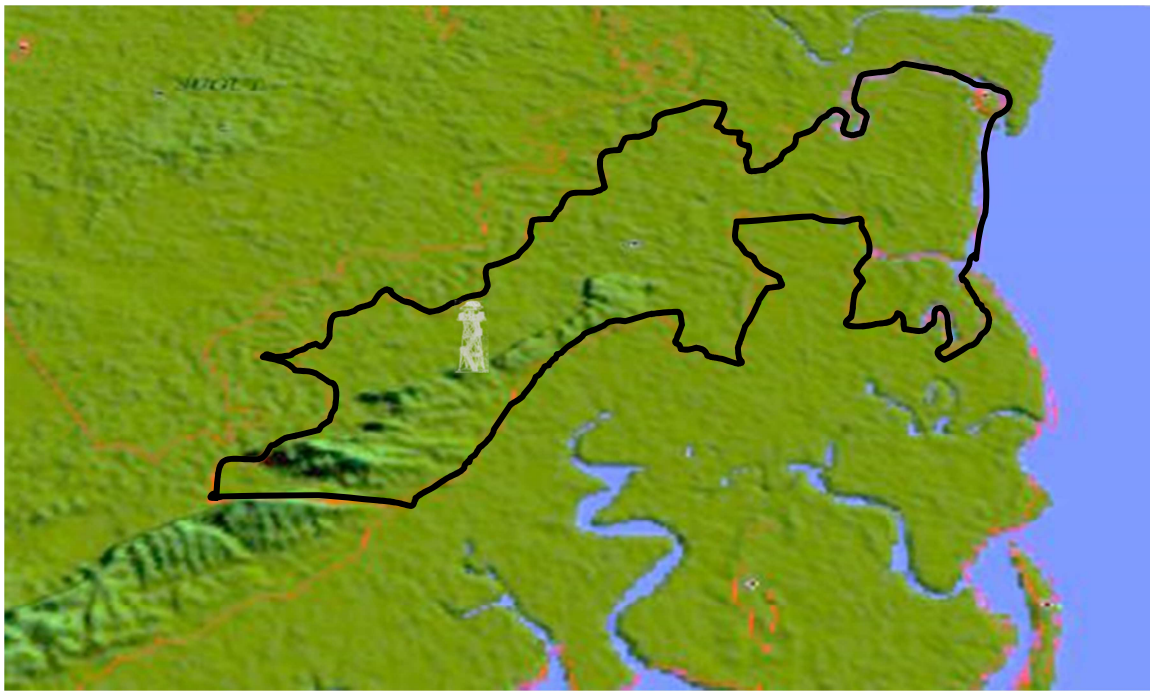


Figure 14: Location of Fire Towers

Figure 15: Isometric View of a 35 Feet Tall Multipurpose Observation Tower.

The observation tower is to be provided with necessary tools such as map of the entire conservation area, binoculars, compass and radio communication. The person manning the observation tower is to be trained to provide proper reporting to the central command especially pertaining to the approximate location of fire so that initial attack crew can be dispatched accordingly.

4.4 Fire Danger Rating System

In fire management, the infamous notion that says prevention is better than cure is very relevant. Thus establishment of Fire Danger rating System (FDRS) is essential. Fire danger rating is a general term used to expressan assessment of both fixed and variable factors of the environment that determine the ease of ignition, rate of spread, difficulty of control and fire impact. While FDRS is a tool used to

process and interpret weather data into risk level across the landscape in numerical values called Fire Weather Index (FWI). When FWI shows a high value, it indicates a condition of high fire hazard; therefore, fire prevention need to be intensified and fire preparedness to be activated.

There are many developed and applied FDRS. However, Forestry Department had adopted FDRS developed in the Canada as it provides comprehensive information on fire risk.

FWI output can also be linked to Geographic Information System to produce a spatial distribution of fire risk throughout the state. Linking FWI into GIS is done at the Forestry Department Headquarters in Sandakan.

The FWI is calculated and evaluated daily at 3 p.m. (1500 hrs) for the purpose of fire danger rating determination and this is governed by the following weather parameters:

- Dry-bulb temperature
- Precipitation
- Wind speed
- Relative humidity

In view of this requirement, weather recording instrument has already established at the field administration office to supplement the data collected from other DFOs.

4.5 Accessibility

Accessibility is the fundamental requirement for effective fire prevention and control. Lack of access was the main contributor to the

massive areas of forest destroyed by fire in Sabah, especially when fire is occurred in the remote part of the forest area.

With reference to the road network in Figure 7, most part of conservation area is not accessible by road. The existing road network is extremely inadequate for both prevention and control activities. In view of this emphasis is more on fire prevention through periodic aerial surveillance and continuous monitoring at the fire observation tower.

4.6 Identification of Permanent Water Bodies

Permanent water bodies can be lake, pond and stream or river either natural or manmade that would remain to have water even during prolonged drought. Experience elsewhere, lack of available permanent water source jeopardized any effort to control and extinguish fire.

4.6.1 Rivers and Their Tributaries

In SCA the most important water sources are the major rivers and their tributaries**.** To facilitate into water source, access road and intake point to be marked with the sign board posted on the ground.

4.7 Organizational Structure

Fire prevention and control is essentially an emergency response function. Therefore, it is essential that the management structure for a fire organization in SCA be as direct and action oriented as possible. **Figure 16** shows the fire management organization recommended for SCA.

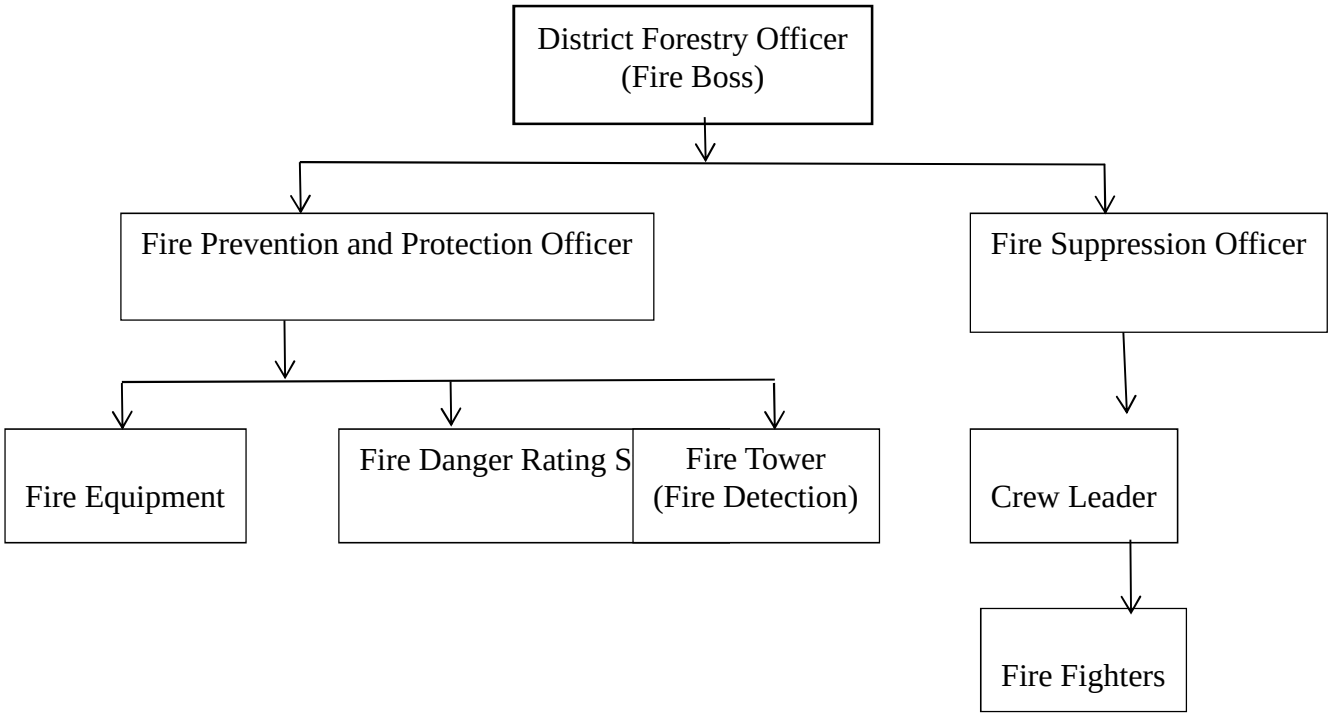


Figure 16: Fire Management Organization for SCA

4.7.1 Fire Manager

A Fire Manager (or Fire Boss) has a mandate to act in anticipation of fire problems as well as coordinate all fire control resources at his disposal within his jurisdiction. The Fire Manager in consultation with his respective officers sets fire control priorities and control strategic deployment of fire control resources.

Regardless of the size and complexity, line of authority remains the same. The organization must be flexible in order to cope with changing requirement of any forest fire.

4.7.2 Fire Prevention and Protection Officer

Fire Prevention and Protection officer is responsible for ensuring all firefighting equipment is in good working condition. In addition, the officer also takes charge of the FDRS operation and takes necessary action when the risk level is high. Besides that, the officer also monitors activities and receives reports from all fire towers.

4.7.3 Fire Suppression Officer

The Fire Suppression Officer is responsible for preparedness of Initial Attack Crews. It is recommended that 4 initial attack crews be established. These crews are drawn from the existing field workers. As they are required to perform their normal job, during ordinary time only one crew may be put on standby and perhaps carry out ground surveillance but during a significant dry season and FDRS reading point out a high level of risk other crews should also be put on standby for any eventualities.

4.7 Fire Equipment

The success of forest fire prevention and suppression depends not only on the manpower and applied methods, but also on the provision of adequate equipment, facilities and qualified staff. The type and number of the provided equipment and facilities must be suitable for the local climatic and terrain conditions. Ideally for effective fire

suppression in SCA firefighting equipment listed in Table 4 for heavy machinery and Table 5 for hand tools, water delivery system etc must be made available. However, subject to fund availability equipment listed in Table 5 is the priority.

Table 4: Heavy Machineries and Vehicles Use for Firefighting

TYPE OF HEAVY MACHINERY	CAPABLITY
Tractor/Bulldozers	Construction of fire breaks
Excavator	• Dig holes in ground to keep water for fire pump • Construction of fire breaks
Dump Truck	Transportation of water and relay tanks
Back Hoe	• Dig holes in ground to keep water for fire pump • Construction of fire breaks
TYPE OF LAND BOUND VEHICLE	**CAPABILITY**
Mini Lorry	Mobilizing ground patrols, fire crews and transportation of water
Toyota L/C – Pick Up	

Table 5: Hand Tools Use for Firefighting

HAND TOOLS	WATER DELIVERY SYSTEM	SAFETY	OTHERS
• Shovels • Parangs • Pulaskis • Axes • Hoes • Drip Torches	• Water pumps • Handtank pumps • Water hoses -1.5″x100′ (lined) -1.5″x100′ (unlined) • 2″x10′ suction hose	• Goggles • Hard hats with ear muffs and face screen • First aid kits	• Radios • Chainsaws

• Mcleod fire rakes or Fire swatters	• Hose stranglers • Water thieves • Portable relay tanks • Pick-up truck with slip-on water tank	• Boots with fire resistant soles • Gloves	

The crews undertake initial attack on fires is to be fully equipped as follows:

Quantity	**Equipment Type**
4	Shovels
4	Pulaski
4	Parangs
4	Fire Swatter
3	Backtank Pump
2	Drip Torches
2	Pump (Small, 55psi)
2	Pump (Large, 260 psi)
2500ft	1 ½ Discharge Hose
1	100 gal Slip-on Tank
1	Chainsaw
1	First Aid Kits
1	Radios
4 Sets	Personal Safety Equipment

4.8 Fire Preparedness

Notwithstanding the state of vulnerability to fire, two levels of fire preparedness to be adopted in SCA namely, annual preparedness and daily preparedness.

4.8.1 Annual Preparedness

Annual preparedness comprises activities which improve the state of readiness of the organization before normal fire start. It includes staff and crew preparations, equipment and facilities. The key to fire preparedness is training and recurrence training. To maintain high level of preparedness, recurrence training is to be conducted annually especially in fire prevention and suppression technique, including two practical exercises.

In this respect, the DFO is to develop its capability to conduct in-house training. For initial stage, the DFO is to engage outside trainer to train in-house trainers.

4.8.2 Daily Preparedness

Daily preparedness involves adapting the level of preparedness each day in response to the fire danger conditions. It include weather and danger monitoring, organizing prevention efforts, scheduling detection activities, setting alert levels for the crew, and determining prevention activities.

Based on the daily danger level, the following preparedness levels should be activated:

LEVEL	FIRE MANAGEMENT ACTIONS			REQUIRED EARLY WARNING INFORMATION
	PREVENTION	DETECTION	SUPPRESSION	
LOW	▪ Ensure that fire danger road signs are set on a daily basis.			▪ Hunting activity in different areas ▪ Potential for fires to start ▪ Potential for fires to spread and damage plantation ▪ Resources available for detection ▪ Resources available for suppression
MEDIUM	▪ Weekly notification to wildlife department	▪ Fire tower observation in afternoon ▪ Patrols in some areas	▪ Weekly equipment check	
HIGH	▪ Daily notification to wildlife ▪ Daily notification to village head	▪ Fire tower observation all day ▪ Extensive patrols	▪ Notifiy adjacent districts of possible request for assistance ▪ Daily equipment check	
EXTREME	▪ Daily media notification ▪ Hunting restrictions	▪ Procure aerial detection services	▪ Request suppression resources from adjacent districts	

4.9 Awareness Programme

Main cause of forest fires in Sabah is human activities. Cause of previous fires in SCA is believed to be related to human activities. Currently, illegal hunter and nearby plantation workers are potential cause of fire identified in SCA.

Therefore, based on the nature of the two potential fire causes, two strategies can be drawn. One is to conduct public awareness campaign on the catastrophic impact of fire to the adjacent forest resources. This awareness campaign is directed to both oil plantation owners and local communities living adjacent to FR reserve. Sign board informing public to refrain from conducting open burning during dry period must also be posted in various strategic locations.

On the other hands, to prevent or at least minimize illegal hunting activities, constant patrolling along the long stretch of outer boundary

of the FR has to be carried out. Meanwhile, all potential entry point by illegal hunters must be identified and monitored accordingly.

4.10 Fire Prevention and Control Strategy

Ideally, effective fire prevention and control strategy should encompasses 3 stages of approach in sequence order i.e. prevention, early detection and suppression.

4.10.1 Fire Prevention

Fire prevention means stopping all unwanted people caused fires before them start. Base on the assumption, the main causes of previous forest fire in SCA were illegal hunting activities. Therefore, the most effective prevention begins before fires start and effective way to deliver messages is through awareness campaign which includes:

- Dialog with the local communities, and oil palm plantation owners,
- Distribution of brochures, posters and stickers, and
- Forest Fire Danger sign in strategic location.

Personal contact is the most effective method to get the prevention message out.

4.10.2 Fire Control

Successful fire control depends on getting to fires when they are small and easier to control. To achieve this, fires must be detected and reported quickly, and initial attack must be initiated immediately once report of fire received.

i) Detection

- Fire Towers

Fire towers activated and staffed when appropriate, based on fire danger rating. A fire tower person should have the following minimum compliment of equipment:

- Maps of look out area with latitude and longitude, fire zones, fire blocks and compartments,
- Several copies of Initial Report Form (Appendix 1)
- Pencils and pens
- A transparent ruler
- A lined notepad
- Binoculars
- A two way radio or cellular telephone
- A compass
- A fire finder, which allow them to plot fires in a 360^0 radius from the lookout site

- Ground Patrols

Ground patrols are an effective detection and prevention tool, but their effectiveness is limited to areas where there is adequate access. When planning for ground patrols, permanent routes would be established. Route that provides good viewing coverage and opportunity to meet with local residents will be chosen.

A ground patrol kit will be assembled to include:

- Map of the FMU area with latitude and longitude, fire zones, fire blocks and compartments,
- Several copies of Initial Report Form (Appendix 1)
- Pencils and pens

- A transparent ruler
- A lined notepad
- Binoculars
- A two way radio or cellular telephone
- A compass
- A Global Positioning System (GPS).

i) Initial Attack

When report of fire occurrence from either fire tower or ground patrol is received by the Central Command, it will be quickly analyzed and interpreted. Meanwhile,initial attack crew will be dispatched to the site to control the fire.

ii) Expanded Attack

If a fire cannot be contained with initial attack efforts, expanded attack will be invoked. This will involve reinforcement by dispatching more crews and heavy equipment as necessary.

In order for the suppression crews to acquire a comprehensive skill in fire suppression they are required to undergo training in fire prevention and control.

Appendix 1

Initial Fire Report Form

Report Number_____ Date___ /___ / ___ Time_____:___ Person Reporting Fire:_____ Phone No._____ Fire Tower Number:_____ Person Taking Report:_____ Office:_____
Location Zone_____ Block_____ Compartment_____ Description_____ _ _____
Direction of fire:
What is burning?
Size of fire o Campfire o House o Football Field o Bigger
Type of fire o Smoldering o Open Flame o Fast Moving
Landform o Flat o Moderate o Steep
Water availability o Yes o No Distance: _____ meters
Distance to driving (Road):_____meters
Is anyone fighting fire? o Yes o No
Are home/building threatened? o Yes o No
Comments/action taken:

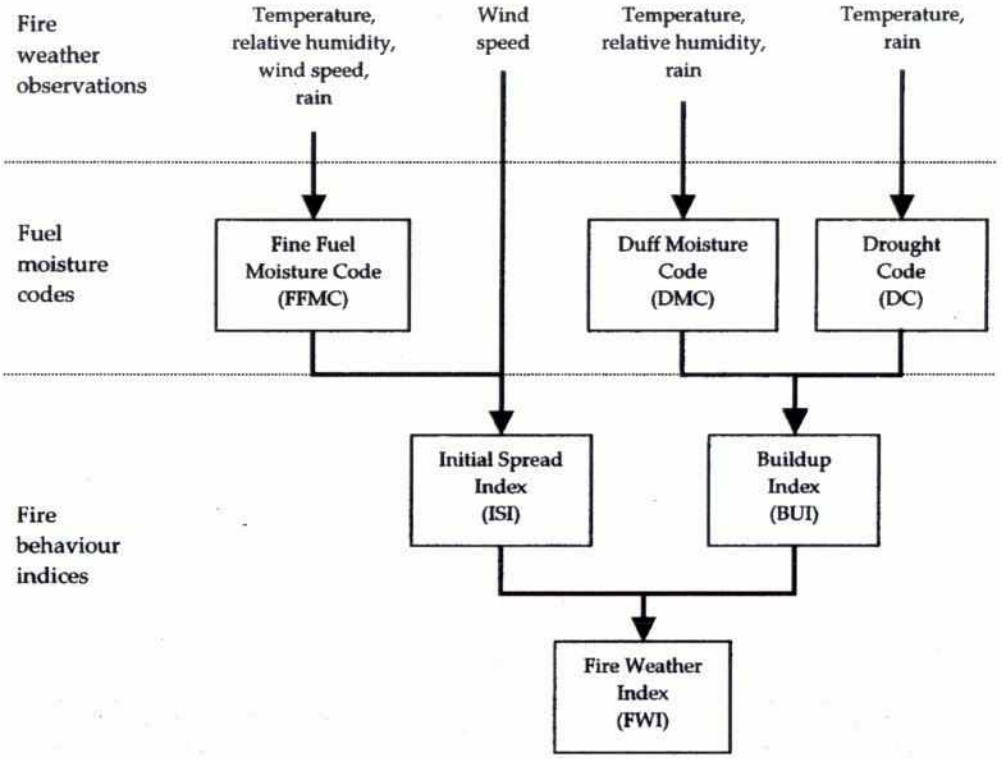
APPENDIX 1

Fire Weather Index Structure and Calculation

ABSTRACT

These tables are an adaptation of the fourth edition of tables for calculating the components of the Canadian Forest Fire Weather Index System, done as part of the Southeast Asia Fire Danger Rating System Project. In this edition, tables for the Duff Moisture Code and Drought Code have been simplified for calculations at latitudes near the equator. These changes are described in the appendix following the tables. All other contents are the same as the fourth edition.

STRUCTURE OF THE CANADIAN FOREST FIRE WEATHER INDEX SYSTEM



STANDARD COMPONENTS

The six standard components of the FWI System provide numerical ratings of relative wildland fire potential. The first three components are fuel moisture codes that follow daily changes in the moisture contents of three classes of forest fuel with different drying rates. For each, there are two phases – one for wetting by rain and one for drying – arranged so that the higher values represent lower moisture contents and hence greater flammability. The final three components are fire behavior indexes, representing rate of spread, amount of available fuel, and fire intensity; their values increase as fire weather severity worsens.

The system is dependent on weather only and does not consider differences in risk, fuel or topography. It provides uniform method of rating fire danger across Canada. The six components are described below.

Fine Fuel Moisture Code (FFMC) – a numerical rating of the moisture content of litter and other cured fuels. This code is an indicator of the relative ease of ignition and flammability of fine fuel.

Duff Moisture Code (DMC) – a numerical rating of the average moisture content of loosely compacted organic layers of moderate depth. This code gives an indication of fuel consumption in moderate duff layers and medium-size woody material.

Drought Code (DC) – a numerical rating of the average moisture content of deep, compact, organic layers. This code is a useful indicator of seasonal drought effects on forest fuels, and amount of smoldering in deep duff layers and large logs.

Initial Spread Index (ISI) – a numerical rating of the expected rate of fire spread. It combines the effects of wind and FFMC on rate of spread without the influence of variable quantities of fuel.
Buildup Index (BUI) – a numerical rating of the total amount of fuel available for combustion that combines DMC and DC.

Fire Weather Index (FWI) – a numerical rating of fire intensity that combines ISI and BUI. It is suitable as a general index of fire danger throughout the forested areas of Canada.

STARTING THE CALCULATIONS

When starting FWI calculations for the first time at a new weather station, use moisture code values for the nearest location for which calculations already exist. If no nearby stations are available, use the following starting values: FFMC 85, DMC 6, and DC 15. If recent weather data is available, select a period of heavy rainfall to start the calculations, as this will ensure that the startup values reflect true saturation conditions.

FIRE WEATHER OBSERVATIONS

Calculation of the components of the FWI System is based on consecutive daily observations of temperature, relative humidity, wind speed, and 24-hour rainfall. The daily observations are taken at noon, Local Standard Time. Record the daily observations and calculations on the form contained within this field guide. Further details on weather station and recording standards are found in

Section 7.2 of this manual (Weather in the Canadian Forest Fire Danger Rating System, a user guide to national standards and practices).

Temperature (°C) – observe the dry-bulb and wet-bulb temperatures, using ventilated thermometers, and record to at least the nearest one-half (0.5) degree Celsius.

Relative Humidity (%) – determine the relative humidity from dry-bulb and wet-bulb temperatures and record to the nearest percent.

Wind (km/h) – measure and average wind speed over at least a 10-minute period and record to the nearest whole km/h. The anemometer should be a cup-type counting anemometer, and be located in the open at a height of 10 m above ground. Where possible, clearings should provide a distance of at least twice the tree height between the surrounding forest and the anemometer tower. Use the following conversions for non-standard anemometer heights:

Anemometer Height (m)	**Add**
2.0 – 2.9	48%
3.0 – 3.9	35%
4.0 – 4.9	25%
5.0 – 6.9	15%
7.0 – 8.9	7%
9 – 11.9	No correction

For example, given a wind speed of 12 km/h at 6 m, the 10 m wind speed would be 14 km/h. (12+{15% of 12} = 12 + 1.8 = 14).

Rain (mm) – measure the rain accumulated in the 24 - hour period from noon to noon (LST), and record to the nearest one-fifth (0.2) millimetre. The rain gauge must be located on the ground in the open with the top 0.3 to 0.5 metres above the ground.

MISSING OBSERVATIONS

The FWI System requires an unbroken daily weather record. Days when observations are missed cannot be ignored; the best possible estimate of the missing weather observations is necessary to preserve the continuity of the fuel moisture codes. In the case of days when observations are missed, complete the daily record by one of the following methods, and circle the estimated weather observations on the record form:

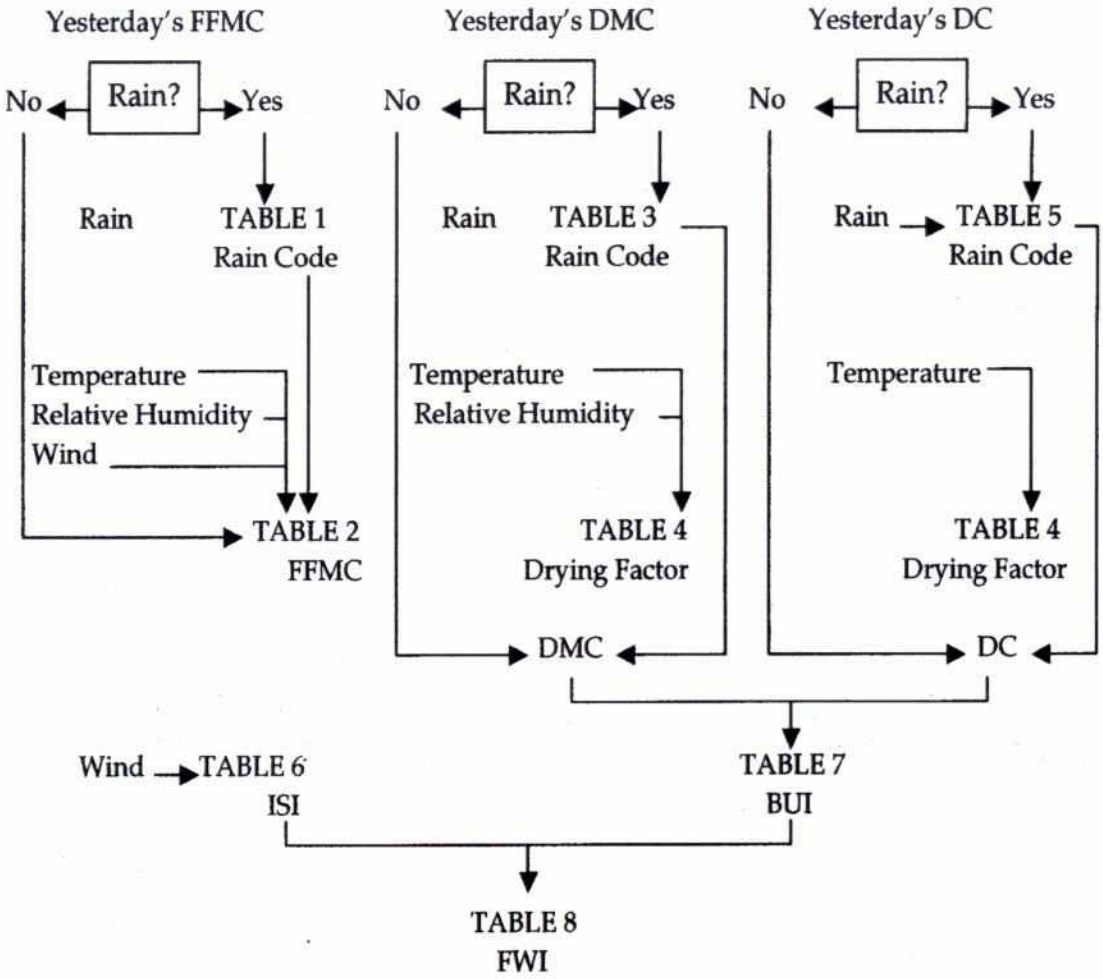
- Use values from recording instruments if available on site;
- Use average of values from one or more nearby similar stations;
- Use average of values from day before and day after; or
- Estimate values from knowledge of recent weather pattern.

CALCULATION INSTRUCTIONS

Record weather observations on the form provided in the field guide.
Steps:

1. If calculations are being performed for the first time, use startup values of FFMC 85, DMC 6, and DC 15 as described previously in the STARTING THE CALCULATIONS section.
2. If there is rain, go to step 3; if there is no rain, go to step 6.
3. Enter Table 1 (p. 8-9) with yesterday's FFMC and rain. Record FFMC rain code.
4. Enter Table 3 (p. 10-11) with yesterday's DMC and rain. Record DMC rain code.
5. Enter Table 5 (p. 12-13) with yesterday's DC and rain. Record DC rain code.
6. Note temperature and enter appropriate section (A-H) of Table 2 (p. 16-31) with relative humidity, wind, and FFMC rain code or yesterday's FFMC. Record today's FFMC.
7. Enter Table 4 (p. 33) with temperature and relative humidity. Record drying factor and add to DMC rain code or yesterday's DMC. This is today's DMC.
8. Enter Table 4 (p. 33) with temperature. Record drying factor and add to DC rain code or to yesterday's DC. This is today's DC.
9. Enter Table 6 (p. 36-37) with wind and FFMC. Record ISI.
10. Enter Table 7 (p. 38-39) with DMC and DC. Record BUI.
11. Enter Table 8 (p. 40-41) with ISI and BUI. Record FWI.

Use the following schematic to determine the proper use of the tables provided in the field guide.



Fuel Moisture Codes: Rainfall Tables

Table 1. Fine Fuel Moisture Code
Table 3. Duff Moisture Code
Table 5. Drought Code

FINE FUEL MOISTURE CODE

TABLE 1

Yesterday's FFMC	Rain (mm) 0.0 | 0.5	0.6 | 0.7	0.8 | 0.9	1.0 | 1.1	1.2 | 1.3	1.4 | 1.5	1.6 | 1.7	1.8 | 2.0	2.1 | 2.3	2.4 | 2.6	2.7 | 2.9	3.0 | 3.2	3.3 | 3.5	3.6 | 3.9	4.0 | 4.4
	Rain Code														
0-2	*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3-7		3	3	3	3	3	3	3	2	2	2	2	2	1	1
8-12		8	8	8	8	8	7	7	6	6	6	5	5	4	4
13-17		13	13	13	12	12	11	11	10	9	8	8	7	7	6
18-22		18	18	17	16	16	15	14	13	12	11	10	10	9	8
23-27		23	23	22	21	20	19	17	16	15	14	13	12	11	10
28-32		28	27	26	25	23	22	21	19	18	17	16	15	13	12
33-37		33	32	30	29	27	26	24	23	21	19	18	17	16	14
38-42		38	36	35	33	31	30	28	26	24	22	21	19	18	17
43-47		43	41	39	37	35	33	31	29	27	25	23	22	20	19
48-52		48	45	43	41	39	37	35	32	30	28	26	24	23	21
53-57		52	50	47	45	43	40	38	35	33	30	28	27	25	23
58-62		57	54	52	49	46	44	41	38	35	33	31	29	27	25
63-67		62	59	56	53	50	47	44	41	38	36	33	31	29	27
68-72		67	63	60	57	54	51	48	44	41	38	36	33	31	29
73-77		71	68	64	61	57	54	51	47	44	41	38	36	33	31
78-79		75	71	67	63	60	57	53	49	45	42	40	37	35	32
80		76	72	68	64	61	58	54	50	46	43	40	38	35	33
81		77	73	69	65	62	58	55	50	47	44	41	38	36	33
82		78	74	70	66	62	59	55	51	47	44	41	39	36	33
83		79	75	71	67	63	60	56	51	48	44	42	39	36	34
84		80	76	71	67	64	60	56	52	48	45	42	39	37	34
85		81	76	72	68	64	61	57	53	49	45	42	40	37	34
86		82	77	73	69	65	62	58	53	49	46	43	40	38	35
87		83	78	74	70	66	62	58	54	50	46	43	41	38	35
88		84	79	75	70	67	63	59	54	50	47	44	41	38	35
89		85	80	75	71	67	64	59	55	51	47	44	42	39	36
90		86	81	76	72	68	64	60	55	51	48	45	42	39	36
91		87	82	77	73	69	65	61	56	52	48	45	42	40	37
92		88	83	78	73	69	66	61	56	52	49	46	43	40	37
93		88	83	79	74	70	66	62	57	53	49	46	43	40	37
94		89	84	79	75	71	67	62	58	53	50	46	44	41	38
95		90	85	80	76	71	68	63	58	54	50	47	44	41	38
96		91	86	81	76	72	68	64	59	54	51	47	44	41	38
97		92	87	82	77	73	69	64	59	55	51	48	45	42	39
98		93	88	83	78	74	69	65	60	55	51	48	45	42	39
99		94	89	83	79	74	70	65	60	56	52	48	46	43	39

*** If Rain is less than 0.6 mm, today's Rain Code = yesterday's FFMC**

FFMC **TABLE 1**

Yesterday's FFMC	Rain (mm) 4.5 | 5.0	5.1 | 5.7	5.8 | 6.6	6.7 | 7.7	7.8 | 9.1	9.2 | 11.5	11.6 | 14.5	14.6 | 17.5	17.6 | 21.5	21.6 | 25.5	25.6 | 30.5	30.6 | 37.5	37.6 | 46.5	46.6 | 58.5	≥ 59.6
	Rain Code														
0-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3-7	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
8-12	4	3	3	2	2	1	1	0	0	0	0	0	0	0	0
13-17	6	5	4	4	3	2	1	1	0	0	0	0	0	0	0
18-22	7	6	6	5	4	3	2	1	1	0	0	0	0	0	0
23-27	9	8	7	6	5	4	3	2	1	1	0	0	0	0	0
28-32	11	10	9	7	6	5	4	3	2	1	1	1	0	0	0
33-37	13	12	10	9	8	6	5	4	3	2	2	1	1	1	0
38-42	15	13	12	10	9	7	6	5	4	3	3	2	2	1	1
43-47	17	15	14	12	10	9	7	6	5	4	4	3	3	2	2
48-52	19	17	15	13	12	10	8	7	6	5	5	4	3	3	3
53-57	21	19	17	15	13	11	9	8	7	6	5	5	4	4	3
58-62	23	21	18	16	15	12	11	9	8	7	6	6	5	5	4
63-67	25	22	20	18	16	14	12	10	9	8	7	7	6	6	5
68-72	26	24	22	19	17	15	13	11	10	9	8	8	7	6	6
73-77	28	26	23	21	18	16	14	12	11	10	9	8	8	7	7
78-79	29	27	24	22	19	17	15	13	12	11	10	9	8	8	7
80	30	27	25	22	20	17	15	13	12	11	10	9	9	8	8
81	30	27	25	22	20	17	15	13	12	11	10	9	9	8	8
82	30	28	25	23	20	18	15	14	12	11	10	10	9	8	8
83	31	28	25	23	20	18	16	14	12	11	11	10	9	8	8
84	31	28	26	23	21	18	16	14	13	12	11	10	9	9	8
85	31	29	26	23	21	18	16	14	13	12	11	10	9	9	8
86	32	29	26	24	21	19	16	14	13	12	11	10	10	9	8
87	32	29	27	24	21	19	16	15	13	12	11	10	10	9	9
88	32	30	27	24	22	19	17	15	13	12	11	11	10	9	9
89	33	30	27	24	22	19	17	15	13	12	12	11	10	9	9
90	33	30	27	25	22	19	17	15	14	13	12	11	10	10	9
91	33	31	28	25	22	20	17	15	14	13	12	11	10	10	9
92	34	31	28	25	23	20	17	15	14	13	12	11	10	10	9
93	34	31	28	25	23	20	17	16	14	13	12	11	11	10	9
94	34	31	28	26	23	20	18	16	14	13	12	11	11	10	10
95	35	32	29	26	23	20	18	16	15	13	12	12	11	10	10
96	35	32	29	26	24	21	18	16	15	14	13	12	11	10	10
97	35	32	29	26	24	21	18	16	15	14	13	12	11	11	10
98	36	33	30	27	24	21	18	17	15	14	13	12	11	11	10
99	36	33	30	27	24	21	19	17	15	14	13	12	11	11	10

DUFF MOISTURE CODE **TABLE 3**

Yesterday's DMC	Rain (mm) 0.0 | 1.4	1.5 | 1.6	1.7 | 1.8	1.9 | 2.0	2.1 | 2.2	2.3 | 2.5	2.6 | 2.8	2.9 | 3.1	3.2 | 3.4	3.5 | 3.8	3.9 | 4.2	4.3 | 4.6	4.7 | 5.1	5.2 | 5.7	5.8 | 6.4
	Rain Code														
0-2	*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3-5		3	3	3	3	2	2	2	2	2	2	2	2	2	2
6-8		6	6	6	5	5	5	5	4	4	4	4	4	4	3
9-11		9	9	8	8	8	7	7	7	6	6	6	6	6	5
12-14		12	12	11	11	10	10	9	9	9	8	8	8	7	7
15-17		15	15	14	14	13	12	12	11	11	11	10	10	9	9
18-20		18	18	17	16	16	15	14	14	13	13	12	12	11	11
21-23		21	20	20	19	18	17	17	16	16	15	14	14	13	13
24-26		24	23	22	22	21	20	19	19	18	17	17	16	15	15
27-29		27	26	25	24	24	23	22	21	20	19	19	18	17	16
30-33		30	29	28	28	27	26	25	24	23	22	21	20	19	19
34-37		34	33	32	31	30	29	28	27	26	25	24	23	22	21
38-41		38	37	36	35	34	32	31	30	29	28	27	26	25	24
42-45		42	41	40	38	37	36	34	33	32	31	30	29	28	26
46-49		46	45	43	42	40	39	38	36	35	34	33	32	30	29
50-53		50	48	47	45	44	42	41	39	38	37	35	34	33	32
54-57		54	52	50	49	47	45	44	42	41	39	38	37	35	34
58-61		58	56	54	52	50	48	47	45	44	42	41	39	38	36
62-66		62	60	58	56	54	52	50	48	47	45	43	42	40	39
67-71		67	64	62	60	58	56	54	52	50	48	47	45	44	42
72-76		71	69	66	64	62	59	57	56	54	52	50	48	47	45
77-81		76	73	71	68	66	63	61	59	57	55	53	51	50	48
82-86		81	77	75	72	69	67	64	62	60	58	56	54	53	51
87-91		85	82	79	76	73	70	67	65	63	61	59	57	55	53
92-97		90	86	83	80	77	74	71	69	66	64	62	60	58	56
98-103		96	91	88	84	81	77	74	72	69	67	65	63	61	59
104-109		101	96	92	88	85	81	78	75	73	70	68	66	64	62
110-115		106	101	96	92	88	84	81	78	75	73	71	68	66	64
116-122		112	106	101	96	92	88	84	81	78	76	73	71	69	67
123-129		118	111	105	100	96	91	87	84	81	78	76	74	71	69
130-137		124	116	110	105	99	95	91	87	84	81	79	76	74	71
138-146		131	122	114	109	103	98	94	90	87	84	81	79	76	74
147-156		138	127	119	113	107	101	97	93	90	87	84	81	79	76
157-168		146	133	124	118	111	1O5	100	96	93	89	86	84	81	79
169-184		155	140	130	122	115	109	103	99	96	92	89	86	84	81
185-207		166	148	136	127	119	112	107	103	99	95	92	89	87	84
208-241		178	I55	142	132	124	116	111	106	102	98	95	92	90	87
242-291		189	161	146	136	127	119	113	109	105	101	98	95	92	90
292-363		195	165	149	138	129	121	116	111	107	103	100	97	95	92
364-462		197	166	150	140	130	123	117	113	109	105	102	99	97	94

*** If Rain is less than 1.5 mm, today's Rain Code = yesterday's DMC**

DMC **TABLE 3**

Yesterday's DMC	Rain (mm) 6.5 | 7.2	7.3 | 8.2	8.3 | 9.4	9.5 | 11.5	11.6 | 14.5	14.6 | 17.5	17.6 | 20.5	20.6 | 24.5	24.6 | 28.5	28.6 | 33.5	33.6 | 39.5	39.6 | 47.5	47.6 | 59.5	59.6 | 79.5	≥ 79.6
	Rain Code														
0-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3-5	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1
6-8	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
9-11	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4
12-14	7	7	6	6	6	6	6	5	5	5	5	5	5	5	5
15-17	9	8	8	8	7	7	7	7	6	6	6	6	6	6	6
18-20	11	10	10	9	9	8	8	8	7	7	7	7	7	7	7
21-23	12	12	11	11	10	9	9	9	8	8	8	8	8	7	7
24-26	14	13	13	12	11	11	10	10	9	9	9	8	8	8	8
27-29	16	15	14	13	12	12	11	11	10	10	9	9	9	8	8
30-33	18	17	16	15	14	13	12	11	11	10	10	10	9	9	9
34-37	20	19	18	17	16	14	14	13	12	12	11	11	10	10	10
38-41	23	22	21	19	18	17	16	15	14	14	13	13	12	12	11
42-45	25	24	23	22	20	19	18	17	16	16	15	15	14	14	13
46-49	28	27	25	24	22	21	20	19	18	18	17	16	16	15	15
50-53	30	29	28	26	24	23	22	21	20	19	19	18	18	17	16
54-57	33	31	30	28	26	25	23	23	22	21	20	20	19	19	18
58-61	35	33	32	30	28	26	25	24	23	23	22	21	21	20	19
62-66	37	36	34	32	30	28	27	26	25	24	23	23	22	21	21
67-71	40	39	37	35	33	31	30	29	28	27	27	26	25	25	24
72-76	43	42	40	38	36	34	33	32	31	30	29	29	28	28	27
77-81	46	45	43	41	39	37	36	35	34	33	32	32	31	30	30
82-86	49	47	46	44	41	40	38	37	36	36	35	34	34	33	32
87-91	52	50	48	46	44	42	41	40	39	38	37	37	36	35	35
92-97	54	52	51	49	46	45	43	42	41	41	40	39	39	38	37
98-103	57	55	53	51	49	47	46	45	44	43	42	42	41	41	40
104-109	60	58	56	54	51	50	48	47	46	46	45	44	44	43	42
110-115	62	60	58	56	54	52	51	49	49	48	47	46	46	45	45
116-122	65	63	61	59	56	54	53	52	51	50	49	49	48	47	47
123-129	67	65	63	61	58	56	55	54	53	52	52	51	50	50	49
130-137	69	67	65	63	60	59	57	56	55	54	54	53	52	52	51
138-146	72	70	68	65	63	61	59	58	57	57	56	55	55	54	53
147-156	74	72	70	68	65	63	62	61	60	59	58	58	57	56	56
157-168	76	74	72	70	67	65	64	63	62	61	60	60	59	59	58
169-184	79	77	75	72	70	68	66	65	64	64	63	62	62	61	60
185-207	82	79	77	75	72	70	69	68	67	66	66	65	64	64	63
208-241	85	82	80	78	75	73	72	71	70	69	69	68	68	67	66
242-291	87	85	83	81	78	76	75	74	73	73	72	71	71	70	70
292-363	90	88	86	84	81	79	78	77	76	76	75	75	74	74	73
364-462	92	90	88	86	84	82	81	80	79	79	78	78	77	77	76

DROUGHT CODE

TABLE 5

Yesterday's DC	Rain (mm) 0 | 2.8	2.9 | 4.6	4.7 | 6.2	6.3 | 7.8	7.9 | 9.4	9.5 | 11.5	11.6 | 13.5	13.6 | 15.5	15.6 | 18.5	18.6 | 21.5	21.6 | 25.5	25.6 | 30.5	30.6 | 35.5	35.6 | 40.5
	Rain Code													
0-14	*	0	0	0	0	0	0	0	0	0	0	0	0	0
15-29		15	15	13	10	7	3	0	0	0	0	0	0	0
30-44		30	30	27	24	21	18	14	10	5	0	0	0	0
45-59		45	45	42	39	36	32	28	24	19	13	5	0	0
60-74		60	59	56	53	50	46	43	38	33	27	19	10	2
75-89		75	74	71	68	64	60	57	52	46	40	32	23	15
90-104		90	89	86	82	79	75	71	66	60	54	45	36	27
105-119		105	104	100	97	93	89	85	80	74	67	58	49	40
120-134		120	118	115	111	107	103	99	94	87	80	72	62	52
135-149		135	133	129	126	122	117	113	107	101	94	85	75	65
150-164		150	148	144	140	136	131	127	121	115	107	97	87	77
165-179		165	162	158	155	150	145	141	135	128	120	110	100	89
180-194		180	177	173	169	164	159	154	148	141	133	123	112	102
195-209		195	192	187	183	178	173	168	162	155	146	136	125	114
210-224		210	206	202	197	193	187	182	176	168	159	149	137	126
225-239		225	221	216	212	207	201	196	189	181	172	161	149	138
240-254		240	235	231	226	221	215	209	203	194	185	174	161	149
255-269		255	250	245	240	235	229	223	216	208	198	186	173	161
270-284		270	264	259	254	249	243	237	229	221	211	199	185	173
285-299		285	279	274	269	263	256	250	243	234	224	211	197	184
300-314		299	293	288	283	277	270	264	256	247	236	223	209	196
315-329		314	308	302	297	290	284	277	269	259	249	235	221	207
330-344		329	322	317	311	304	297	290	282	272	261	247	232	218
345-359		343	337	331	325	318	311	304	295	285	273	259	244	229
360-374		358	351	345	339	332	324	317	308	298	286	271	255	240
375-389		373	366	359	353	346	338	330	321	310	298	283	267	251
390-404		387	380	373	367	359	351	343	334	323	310	294	278	262
405-419		402	394	388	381	373	365	356	347	335	322	306	289	272
420-434		417	409	402	395	387	378	369	359	347	334	317	300	283
435-449		431	423	416	408	400	391	382	372	360	346	329	311	293
450-469		448	440	432	424	416	406	397	387	374	360	342	323	305
470-489		468	459	451	443	434	424	415	403	390	375	357	337	319
490-509		487	478	469	461	451	441	431	420	406	390	371	351	332
510-529		506	497	488	479	469	458	448	436	422	406	386	365	345
530-549		526	516	506	497	487	476	465	452	437	420	400	378	358
550-574		547	537	527	517	506	495	484	470	455	437	416	393	372
575-599		572	560	550	539	528	516	504	490	473	455	433	409	387
600-624		596	583	572	562	549	536	524	509	492	473	450	425	402
625-649		620	607	595	584	571	557	544	528	511	491	466	441	417
650-674		643	630	617	605	592	577	564	547	529	508	482	456	431
675-704		670	655	642	629	615	600	585	568	548	526	500	472	446
705-734		698	683	668	655	640	623	608	590	569	546	518	489	462
735-764		727	710	695	680	664	647	631	611	589	565	536	506	478
765-794		755	737	721	705	688	670	653	632	609	584	553	522	493
795-824		783	764	746	730	712	692	674	653	628	602	570	537	507
825-859		813	793	774	756	737	716	697	674	649	621	588	554	522
860-894		846	823	803	784	763	741	721	697	670	641	606	570	538
895-929		878	854	832	812	790	766	745	719	691	660	623	586	552
930-964		910	884	861	839	815	790	767	740	710	678	640	601	566
965-999		942	914	889	865	840	813	789	761	729	695	656	616	579
1000-1039		976	945	918	893	866	838	812	782	749	713	672	630	593
1040-1079		1011	978	949	922	893	863	835	804	769	731	688	645	606
1080-1119		1047	1010	979	950	918	886	858	824	787	748	703	659	618
1120-1159		1081	1042	1008	977	943	909	879	844	805	765	718	671	630
1160-1199		1116	1073	1036	1003	967	932	899	862	822	780	731	683	641

*** If Rain is less than 2.9 mm, today's Rain Code = yesterday's DC**

FINE FUEL MOISTURE CODE

TABLE 2B

Temperature: 5.5 - 10°C

RH (%)	Wind (km/h)	Rain Code or Yesterday's FFMC: 0 | 2	3 | 7	8 | 12	13 | 17	18 | 22	23 | 27	28 | 32	33 | 37	38 | 42	43 | 47	48 | 52	53 | 57	58 | 62	63 | 67	68 | 72	73 | 77	78 | 79	80	81
		FFMC																		
0-10	0-3	35	39	43	48	52	56	59	63	66	70	73	76	78	81	84	86	88	89	89
	4-13	42	46	50	54	58	62	65	68	71	74	76	79	81	84	86	88	89	90	90
	14-28	49	53	57	60	64	67	70	72	75	77	80	82	84	86	87	89	90	91	91
	≥ 29	56	59	62	65	68	71	74	76	78	80	82	84	86	87	89	90	91	92	92
11-18	0-3	33	37	42	46	50	54	58	61	65	68	71	74	77	79	82	84	86	87	87
	4-13	41	44	49	53	56	60	63	66	69	72	75	77	80	82	84	86	87	88	88
	14-28	47	51	55	58	62	65	68	70	73	75	78	80	82	84	85	87	88	89	89
	≥ 29	54	57	60	64	66	69	72	74	76	78	80	82	84	85	87	88	89	89	90
19-28	0-3	32	35	40	44	48	52	56	60	63	66	69	72	75	78	80	83	85	85	86
	4-13	39	42	47	51	54	58	61	64	67	70	73	75	78	80	82	84	86	86	87
	14-28	45	49	53	56	60	63	66	69	71	73	76	78	80	82	84	85	86	87	87
	≥ 29	52	55	58	61	64	67	70	72	74	76	78	80	82	83	85	86	87	87	88
29-38	0-3	29	33	38	42	46	50	54	58	61	64	68	71	73	76	79	82	83	84	84
	4-13	36	40	44	48	52	56	59	62	65	68	71	74	76	78	81	83	84	85	85
	14-28	43	46	50	54	57	61	64	66	69	71	74	76	78	80	82	84	85	85	86
	≥ 29	49	52	56	59	62	65	67	70	72	74	76	78	80	81	83	84	85	86	86
39-49	0-3	26	30	35	39	44	48	52	55	59	62	66	69	72	75	77	80	82	83	83
	4-13	34	37	42	46	50	53	57	60	63	66	69	72	74	77	79	81	83	83	84
	14-28	40	44	48	51	55	58	61	64	67	69	72	74	76	78	80	82	83	84	84
	≥ 29	46	50	53	57	60	63	65	68	70	72	74	76	78	80	81	83	84	84	84
50-61	0-3	23	27	32	36	40	45	49	53	56	60	63	67	70	73	76	79	81	82	82
	4-13	30	34	38	42	46	50	54	57	61	64	67	69	72	75	77	80	81	82	82
	14-28	37	40	44	48	52	55	58	61	64	67	70	72	74	76	79	80	82	82	83
	≥ 29	43	46	50	53	57	60	62	65	67	70	72	74	76	78	79	81	82	83	83
62-73	0-3	19	23	27	32	37	41	45	49	53	57	61	64	68	71	74	77	80	81	81
	4-13	25	29	34	38	42	46	50	54	57	61	64	67	70	73	76	78	80	81	81
	14-28	32	36	40	44	48	51	55	58	61	64	67	69	72	74	77	79	80	81	81
	≥ 29	38	42	45	49	53	56	59	62	64	67	69	72	74	76	78	79	81	81	81
74-84	0-3	14	18	23	27	32	36	41	45	49	53	57	61	65	69	73	76	79	80	81
	4-13	20	24	28	33	37	42	46	50	53	57	61	64	67	71	74	77	79	80	81
	14-28	26	29	34	38	42	46	50	53	57	60	63	66	69	72	75	77	79	80	81
	≥ 29	31	35	39	43	47	50	54	57	60	63	66	68	71	73	75	78	79	80	81
85-93	0-3	8	12	17	22	27	32	36	41	45	50	54	58	63	67	71	75	78	79	79
	4-13	13	17	21	26	31	35	40	44	48	52	56	60	64	68	72	75	78	79	79
	14-28	17	21	25	30	35	39	43	47	51	55	58	62	65	69	72	75	78	79	79
	≥ 29	21	25	29	34	38	42	46	50	53	57	60	64	67	70	73	75	78	78	79
94-100	0-3	3	7	12	17	22	27	32	36	41	46	51	56	60	65	70	74	76	76	77
	4-13	4	8	13	18	23	28	33	38	42	47	52	56	61	65	70	74	75	76	76
	14-28	6	10	15	20	25	29	34	39	43	48	52	57	61	66	70	74	75	75	76
	≥ 29	7	11	16	21	26	31	35	40	44	49	53	57	62	66	70	74	75	75	75

FFMC **TABLE 2B**

Temperature: 5.5 - 10°C																			
		Rain Code or Yesterday's FFMC																	
RH (%)	Wind (km/h)	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
		FFMC																	
	0-3	89	90	90	91	91	92	92	93	93	93	94	94	95	95	96	97	97	98
	4-13	91	91	91	92	92	92	93	93	93	94	94	94	95	95	96	96	97	98
0-10	14-28	91	92	92	92	93	93	93	94	94	94	94	95	95	95	96	96	97	98
	≥ 29	92	92	93	93	93	93	94	94	94	94	95	95	95	95	96	96	97	98
	0-3	88	88	89	89	90	90	90	91	91	92	92	93	94	94	95	96	97	97
	4-13	89	89	89	90	90	90	91	91	92	92	92	93	94	94	95	96	96	97
11-18	14-28	89	90	90	90	91	91	91	91	92	92	92	93	94	94	95	95	96	96
	≥ 29	90	90	90	91	91	91	91	92	92	92	92	93	94	94	95	95	96	96
	0-3	86	87	87	88	88	89	89	89	90	91	91	92	93	93	94	95	95	96
	4-13	87	87	88	88	88	89	89	90	90	91	91	92	93	93	94	94	95	95
19-28	14-28	88	88	88	88	89	89	89	90	90	91	91	92	92	93	93	94	94	95
	≥ 29	88	88	88	89	89	89	89	90	90	91	91	92	92	93	93	93	94	94
	0-3	85	85	86	86	87	87	88	89	89	90	91	91	92	92	93	94	94	95
	4-13	85	86	86	87	87	87	88	89	89	90	90	91	91	92	92	93	93	94
29-38	14-28	86	86	87	87	87	87	88	89	89	90	90	91	91	91	92	92	93	93
	≥ 29	86	87	87	87	87	88	88	89	89	90	90	90	91	91	91	92	92	92
	0-3	84	84	85	85	86	87	87	88	89	89	90	90	91	91	92	92	93	93
	4-13	84	85	85	85	86	87	87	88	88	89	89	90	90	90	91	91	92	92
39-49	14-28	84	85	85	85	86	87	87	88	88	89	89	89	90	90	90	91	91	91
	≥ 29	85	85	85	86	86	87	87	88	88	88	89	89	89	89	90	90	90	91
	0-3	83	83	84	85	86	86	86	87	87	88	88	89	89	90	90	91	91	92
	4-13	83	83	84	85	86	86	86	87	87	87	88	88	89	89	89	90	90	90
50-61	14-28	83	83	84	85	86	86	86	86	87	87	87	88	88	88	89	89	89	89
	≥ 29	83	84	84	85	86	86	86	86	87	87	87	87	88	88	88	88	88	89
	0-3	82	83	84	84	84	85	85	86	86	87	87	87	88	88	89	89	90	90
	4-13	82	83	83	84	84	85	85	85	86	86	86	87	87	87	88	88	88	89
62-73	14-28	82	83	83	84	84	84	85	85	85	86	86	86	86	87	87	87	87	88
	≥ 29	82	83	83	84	84	84	84	85	85	85	85	86	86	86	86	86	87	87
	0-3	81	82	82	83	83	83	84	84	85	85	85	86	86	87	87	87	88	88
	4-13	81	82	82	82	83	83	83	84	84	84	85	85	85	86	86	86	86	87
74-84	14-28	81	82	82	82	82	83	83	83	83	84	84	84	84	85	85	85	85	86
	≥ 29	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	85	85
	0-3	80	80	80	81	81	81	82	82	83	83	83	84	84	84	85	85	86	86
	4-13	79	80	80	80	81	81	81	81	82	82	82	83	83	83	84	84	84	84
85-93	14-28	79	79	80	80	80	80	81	81	81	81	82	82	82	82	82	83	83	83
	≥ 29	79	79	79	80	80	80	80	80	81	81	81	81	81	81	82	82	82	82
	0-3	77	77	78	78	78	79	79	80	80	80	81	81	81	82	82	82	83	83
	4-13	76	77	77	77	78	78	78	78	79	79	79	80	80	80	80	81	81	81
94-100	14-28	76	76	76	77	77	77	77	78	78	78	78	79	79	79	79	79	80	80
	≥29	76	76	76	76	76	77	77	77	77	77	77	78	78	78	78	78	79	79

FINE FUEL MOISTURE CODE

TABLE 2C

Temperature: 10.5 - 15°C

RH (%)	Wind (km/h)	Rain Code or Yesterday's FFMC: 0 | 2	3 | 7	8 | 12	13 | 17	18 | 22	23 | 27	28 | 32	33 | 37	38 | 42	43 | 47	48 | 52	53 | 57	58 | 62	63 | 67	68 | 72	73 | 77	78 | 79	80	81
		FFMC																		
0-10	0-3	41	45	49	54	57	61	64	68	71	74	76	79	81	84	86	88	89	90	90
	4-13	50	53	57	61	64	67	70	73	76	78	80	82	84	86	88	90	91	91	92
	14-28	57	60	64	67	70	73	75	77	80	81	83	85	87	88	90	91	92	92	92
	≥ 29	64	67	70	72	75	77	79	81	83	84	86	87	89	90	91	92	93	93	93
11-18	0-3	40	43	48	52	56	59	63	66	69	72	74	77	79	82	84	86	88	88	89
	4-13	48	51	55	59	62	65	68	71	74	76	78	80	82	84	86	88	89	89	90
	14-28	56	59	62	65	68	71	73	75	77	79	81	83	85	86	88	89	90	90	90
	≥ 29	62	65	68	70	73	75	77	79	81	82	84	85	86	88	89	90	90	91	91
19-28	0-3	38	41	46	50	54	57	61	64	67	70	73	75	78	80	82	84	86	87	87
	4-13	46	49	53	57	60	63	66	69	72	74	76	78	80	82	84	86	87	87	88
	14-28	53	56	60	63	66	68	71	73	75	77	79	81	83	84	86	87	88	88	88
	≥ 29	60	62	65	68	71	73	75	77	78	80	82	83	84	86	87	88	88	89	89
29-38	0-3	35	39	43	47	51	55	58	62	65	68	71	73	76	78	81	83	84	85	85
	4-13	43	47	51	54	58	61	64	67	69	72	74	76	78	80	82	84	85	86	86
	14-28	51	54	57	60	63	66	69	71	73	75	77	79	81	82	84	85	86	86	87
	≥ 29	57	60	63	66	68	70	72	74	76	78	79	81	82	84	85	86	87	87	87
39-49	0-3	32	35	40	44	48	52	56	59	62	65	68	71	74	76	79	81	83	84	84
	4-13	40	43	47	51	55	58	61	64	67	70	72	74	77	79	81	82	84	84	85
	14-28	47	50	54	57	61	63	66	68	71	73	75	77	79	80	82	83	84	85	85
	≥ 29	54	57	60	63	65	68	70	72	74	76	77	79	80	82	83	84	85	85	85
50-61	0-3	27	31	36	40	44	48	52	56	59	63	66	69	72	74	77	80	82	82	83
	4-13	36	39	44	47	51	55	58	61	64	67	69	72	74	77	79	81	82	83	83
	14-28	43	47	50	54	57	60	63	66	68	70	72	75	76	78	80	82	83	83	84
	≥ 29	50	53	56	59	62	65	67	69	71	73	75	77	78	80	81	82	83	84	84
62-73	0-3	22	26	31	35	40	44	48	52	56	59	63	66	69	72	75	78	80	81	82
	4-13	30	34	39	43	47	50	54	57	60	63	66	69	72	74	77	79	81	81	82
	14-28	38	41	45	49	53	56	59	62	65	67	70	72	74	76	78	80	81	82	82
	≥ 29	45	48	51	55	58	61	63	66	68	70	72	74	76	77	79	80	81	82	82
74-84	0-3	16	20	25	30	34	39	43	47	51	55	59	63	66	70	73	77	79	80	81
	4-13	24	27	32	36	41	45	49	52	56	59	63	66	69	72	75	77	79	80	81
	14-28	31	34	38	43	46	50	53	57	60	63	66	68	71	73	76	78	79	80	81
	≥ 29	37	40	44	48	51	55	58	61	63	66	68	70	73	75	77	78	80	80	81
85-93	0-3	10	14	19	24	28	33	38	42	47	51	55	59	63	67	71	75	78	79	79
	4-13	15	19	24	28	33	37	42	46	50	54	58	61	65	69	72	75	78	79	79
	14-28	20	24	29	33	37	42	46	49	53	57	60	63	67	70	73	76	78	79	79
	≥ 29	25	29	33	37	41	45	49	53	56	59	62	65	68	71	73	76	78	79	79
94-100	0-3	3	7	12	17	22	27	32	37	42	46	51	56	61	65	70	75	76	76	77
	4-13	5	9	14	19	24	29	33	38	43	48	52	57	61	66	70	75	76	76	76
	14-28	7	11	16	21	26	30	35	40	44	49	53	57	62	66	70	75	75	76	76
	≥ 29	9	13	18	22	27	32	36	41	45	50	54	58	62	66	70	75	75	75	76

FFMC **TABLE 2C**

Temperature: 10.5 - 15°C																			
		Rain Code or Yesterday's FFMC																	
RH (%)	Wind (km/h)	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
		FFMC																	
	0-3	91	91	91	92	92	93	93	93	94	94	94	95	95	95	96	97	97	98
	4-13	92	92	92	93	93	93	94	94	94	94	95	95	95	96	96	97	97	98
0-10	14-28	93	93	93	93	94	94	94	94	95	95	95	95	95	96	96	97	97	98
	≥ 29	93	94	94	94	94	94	95	95	95	95	95	95	96	96	96	97	97	98
	0-3	89	89	90	90	90	91	91	92	92	92	93	93	94	95	95	96	97	97
	4-13	90	90	90	91	91	91	92	92	92	93	93	93	94	94	95	96	96	97
11-18	14-28	91	91	91	91	92	92	92	92	92	93	93	93	94	94	95	95	96	96
	≥ 29	91	91	92	92	92	92	92	92	93	93	93	93	94	94	95	95	96	96
	0-3	87	88	88	89	89	89	90	90	90	91	92	92	93	94	94	95	95	95
	4-13	88	88	89	89	89	90	90	90	90	91	92	92	93	93	94	94	95	95
19-28	14-28	89	89	89	89	90	90	90	90	91	91	92	92	93	93	94	94	94	95
	≥ 29	89	89	90	90	90	90	90	90	91	91	92	92	93	93	93	94	94	94
	0-3	86	86	87	87	87	88	88	89	90	90	91	91	92	92	93	94	94	95
	4-13	86	87	87	87	88	88	88	89	90	90	91	91	92	92	92	93	93	94
29-38	14-28	87	87	87	88	88	88	88	89	90	90	91	91	91	92	92	92	93	93
	≥ 29	87	88	88	88	88	88	89	89	90	90	91	91	91	91	92	92	92	92
	0-3	85	85	85	86	86	87	88	88	89	89	90	90	91	91	92	92	93	93
	4-13	85	85	86	86	86	87	88	88	89	89	89	90	90	91	91	91	92	92
39-49	14-28	85	86	86	86	86	87	88	88	89	89	89	89	90	90	90	91	91	91
	≥ 29	86	86	86	86	87	87	88	88	89	89	89	89	89	90	90	90	90	90
	0-3	83	84	84	85	86	86	87	87	88	88	88	89	89	90	90	90	90	91
	4-13	84	84	84	85	86	86	87	87	87	88	88	88	89	89	89	90	90	90
50-61	14-28	84	84	84	85	86	86	87	87	87	87	88	88	88	88	89	89	89	89
	≥ 29	84	84	85	85	86	86	87	87	87	87	87	88	88	88	88	88	88	89
	0-3	82	83	84	84	85	85	86	86	86	87	87	87	88	88	88	89	89	89
	4-13	82	83	84	84	85	85	85	86	86	86	86	87	87	87	87	88	88	88
62-73	14-28	82	83	84	84	85	85	85	85	85	86	86	86	86	87	87	87	87	87
	≥ 29	82	83	84	84	84	85	85	85	85	85	86	86	86	86	86	86	87	87
	0-3	82	82	83	83	83	84	84	84	85	85	85	86	86	86	87	87	87	87
	4-13	82	82	82	83	83	83	83	84	84	84	85	85	85	85	86	86	86	86
74-84	14-28	82	82	82	82	83	83	83	83	84	84	84	84	84	85	85	85	85	85
	≥ 29	82	82	82	82	83	83	83	83	83	83	83	84	84	84	84	84	84	85
	0-3	80	80	80	81	81	81	82	82	82	83	83	83	84	84	84	85	85	85
	4-13	80	80	80	80	81	81	81	81	82	82	82	82	83	83	83	83	83	84
85-93	14-28	79	80	80	80	80	80	81	81	81	81	81	82	82	82	82	82	82	83
	≥ 29	79	79	80	80	80	80	80	80	81	81	81	81	81	81	81	81	82	82
	0-3	77	77	78	78	78	78	79	79	79	80	80	80	81	81	81	81	82	82
	4-13	76	77	77	77	77	78	78	78	78	79	79	79	79	79	80	80	80	80
94-100	14-28	76	76	76	77	77	77	77	77	78	78	78	78	78	78	79	79	79	79
	≥ 29	76	76	76	76	76	76	77	77	77	77	77	77	77	78	78	78	78	78

FINE FUEL MOISTURE CODE

TABLE 2D

Temperature: 15.5 - 20°C

RH (%)	Wind km/h	Rain Code or Yesterday's FFMC: 0 | 2	3 | 7	8 | 12	13 | 17	18 | 22	23 | 27	28 | 32	33 | 37	38 | 42	43 | 47	48 | 52	53 | 57	58 | 62	63 | 67	68 | 72	73 | 77	78 | 79	80	81
		FFMC																		
0-10	0-3	49	52	56	60	64	67	70	73	75	78	80	82	84	86	88	90	91	91	92
	4-13	58	61	65	68	71	73	76	78	80	82	84	86	87	89	90	91	92	93	93
	14-28	66	69	72	74	76	79	81	82	84	85	87	88	89	91	92	93	93	94	94
	≥29	73	75	77	79	81	83	84	86	87	88	89	90	91	92	93	94	94	94	94
11-18	0-3	47	51	55	58	62	65	68	71	73	76	78	80	82	84	86	88	89	90	90
	4-13	56	59	63	66	69	71	74	76	78	80	82	84	85	87	88	89	90	91	91
	14-28	64	67	69	72	74	76	78	80	82	83	85	86	87	89	90	91	91	92	92
	≥29	71	73	75	77	79	81	82	83	85	86	87	88	89	90	91	91	92	92	92
19-28	0-3	45	48	52	56	59	63	66	68	71	74	76	78	80	82	84	86	87	88	88
	4-13	54	57	60	63	66	69	72	74	76	78	80	82	83	85	86	88	88	89	89
	14-28	62	64	67	70	72	74	76	78	80	81	83	84	85	86	88	89	89	90	90
	≥29	68	70	73	75	77	78	80	81	83	84	85	86	87	88	89	89	90	90	90
29-38	0-3	41	45	49	53	57	60	63	66	69	71	74	76	78	80	82	84	86	86	87
	4-13	51	54	57	61	64	66	69	71	74	76	78	79	81	83	84	86	87	87	87
	14-28	59	61	64	67	69	72	74	76	77	79	80	82	83	84	86	87	87	88	88
	≥29	65	67	70	72	74	76	77	79	80	81	83	84	85	86	87	87	88	88	88
39-49	0-3	38	41	45	49	53	57	60	63	66	69	71	74	76	78	81	83	84	85	85
	4-13	47	50	54	57	60	63	66	69	71	73	75	77	79	81	82	84	85	85	86
	14-28	55	58	61	64	66	69	71	73	75	77	78	80	81	82	84	85	86	86	86
	≥29	62	64	67	69	71	73	75	76	78	79	80	82	83	84	85	86	86	86	87
50-61	0-3	33	36	41	45	49	53	56	59	63	66	68	71	74	76	79	81	82	83	83
	4-13	42	46	49	53	56	60	62	65	68	70	72	75	77	79	80	82	83	84	84
	14-28	51	54	57	60	63	65	68	70	72	74	76	77	79	80	82	83	84	84	84
	≥29	58	60	63	65	68	70	72	73	75	77	78	79	80	82	83	84	84	85	85
62-73	0-3	27	30	35	39	44	48	51	55	58	62	65	68	71	74	76	79	81	82	82
	4-13	36	40	44	48	51	55	58	61	64	67	69	72	74	76	78	80	81	82	82
	14-28	45	48	51	55	58	61	63	66	68	70	72	74	76	78	79	81	82	82	83
	≥29	52	55	58	61	63	66	68	70	72	73	75	76	78	79	80	82	82	83	83
74-84	0-3	20	23	28	33	37	42	46	50	54	57	61	64	68	71	74	77	79	80	81
	4-13	28	32	36	41	45	48	52	55	59	62	65	68	71	73	76	78	80	80	81
	14-28	36	40	44	47	51	54	57	60	63	66	68	71	73	75	77	79	80	81	81
	≥29	43	47	50	53	56	59	62	64	67	69	71	73	74	76	78	79	80	81	81
85-93	0-3	12	16	21	25	30	35	39	44	48	52	56	60	64	68	72	75	78	80	80
	4-13	18	22	27	31	36	40	44	48	52	56	59	63	66	70	73	76	78	80	80
	14-28	24	28	32	37	41	45	48	52	56	59	62	65	68	71	74	76	78	80	80
	≥29	30	33	38	42	45	49	52	56	59	62	64	67	70	72	74	77	78	80	80
94-100	0-3	4	8	13	18	23	28	32	37	42	47	51	56	61	65	70	75	76	76	77
	4-13	6	10	15	20	25	30	34	39	44	48	53	57	61	66	70	75	76	76	76
	14-28	8	12	17	22	27	31	36	41	45	49	54	58	62	66	70	75	76	76	76
	≥29	10	14	19	24	29	33	38	42	46	51	55	59	63	67	71	75	76	76	76

FFMC **TABLE 2D**

Temperature: 15.5 - 20°C																			
		Rain Code or Yesterday's FFMC																	
RH (%)	Wind km/h	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
		FFMC																	
	0-3	92	92	93	93	93	94	94	94	94	95	95	95	96	96	96	97	98	98
	4-13	93	93	94	94	94	94	95	95	95	95	95	96	96	96	96	97	97	98
0-10	14-28	94	94	94	95	95	95	95	95	95	96	96	96	96	96	96	97	97	98
	≥ 29	95	95	95	95	95	95	95	96	96	96	96	96	96	96	96	97	97	98
	0-3	90	91	91	91	91	92	92	92	93	93	93	94	94	95	95	96	97	97
	4-13	91	91	92	92	92	92	93	93	93	93	93	94	94	95	95	96	96	97
11-18	14-28	92	92	92	92	93	93	93	93	93	93	94	94	94	95	95	96	96	97
	≥ 29	92	93	93	93	93	93	93	93	93	94	94	94	94	95	95	96	96	96
	0-3	89	89	89	89	90	90	90	91	91	91	92	93	93	94	94	95	96	96
	4-13	89	90	90	90	90	91	91	91	91	91	92	93	93	94	94	95	95	95
19-28	14-28	90	90	90	90	91	91	91	91	91	91	92	93	93	94	94	94	94	95
	≥ 29	90	91	91	91	91	91	91	91	91	92	92	93	93	93	94	94	94	94
	0-3	87	87	88	88	88	89	89	89	90	91	91	92	92	93	93	94	94	94
	4-13	88	88	88	88	89	89	89	89	90	91	91	92	92	92	93	93	93	94
29-38	14-28	88	88	88	89	89	89	89	89	90	91	91	91	92	92	92	92	93	93
	≥ 29	88	89	89	89	89	89	89	89	90	91	91	91	92	92	92	92	92	92
	0-3	85	86	86	86	87	87	88	89	89	90	90	90	91	91	92	92	92	93
	4-13	86	86	86	87	87	87	88	89	89	90	90	90	90	91	91	91	92	92
39-49	14-28	86	87	87	87	87	87	88	89	89	89	90	90	90	90	91	91	91	91
	≥ 29	87	87	87	87	87	87	88	89	89	89	90	90	90	90	90	90	90	91
	0-3	84	84	85	85	86	87	87	88	88	88	89	89	89	90	90	90	91	91
	4-13	84	85	85	85	86	87	87	87	88	88	88	89	89	89	89	90	90	90
50-61	14-28	85	85	85	85	86	87	87	87	88	88	88	88	88	89	89	89	89	89
	≥ 29	85	85	85	85	86	87	87	87	87	88	88	88	88	88	88	88	89	89
	0-3	83	83	84	85	85	86	86	86	86	87	87	87	88	88	88	89	89	89
	4-13	83	83	84	85	85	85	86	86	86	86	87	87	87	87	87	88	88	88
62-73	14-28	83	83	84	85	85	85	85	86	86	86	86	86	86	87	87	87	87	87
	>29	83	83	84	85	85	85	85	86	86	86	86	86	86	86	86	86	87	87
	0-3	82	83	83	83	84	84	84	84	85	85	85	85	86	86	86	87	87	87
	4-13	82	83	83	83	83	84	84	84	84	84	85	85	85	85	85	85	86	86
74-84	14-28	82	83	83	83	83	83	83	84	84	84	84	84	84	84	85	85	85	85
	≥ 29	82	83	83	83	83	83	83	83	83	84	84	84	84	84	84	84	84	84
	0-3	80	80	81	81	81	81	82	82	82	82	83	83	83	83	84	84	84	84
	4-13	80	80	80	81	81	81	81	81	82	82	82	82	82	82	83	83	83	83
85-93	14-28	80	80	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	82
	≥ 29	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	82
	0-3	77	77	78	78	78	78	78	79	79	79	79	80	80	80	80	81	81	81
	4-13	77	77	77	77	77	77	78	78	78	78	78	79	79	79	79	79	79	79
94-100	14-28	76	76	77	77	77	77	77	77	77	77	78	78	78	78	78	78	78	78
	≥ 29	76	76	76	76	76	77	77	77	77	77	77	77	77	77	77	77	78	78

FINE FUEL MOISTURE CODE

TABLE 2E

Temperature: 20.5 - 25°C

RH (%)	Wind km/h	Rain Code or Yesterday's FFMC																		
		0 | 2	3 | 7	8 | 12	13 | 17	18 | 22	23 | 27	28 | 32	33 | 37	38 | 42	43 | 47	48 | 52	53 | 57	58 | 62	63 | 67	68 | 72	73 | 77	78 | 79	80	81
		FFMC																		
0-10	0-3	57	60	64	67	70	73	75	78	80	82	84	86	87	89	90	92	93	93	93
	4-13	67	69	72	75	77	79	81	83	85	86	87	89	90	91	92	93	94	94	94
	14-28	75	77	79	81	83	84	86	87	88	89	90	91	92	93	94	94	95	95	95
	≥29	81	82	84	85	87	88	89	90	91	91	92	93	93	94	95	95	95	96	96
11-18	0-3	55	58	62	65	68	71	73	76	78	80	82	84	85	87	88	90	91	91	91
	4-13	65	67	70	73	75	77	79	81	83	84	86	87	88	89	90	91	92	92	92
	14-28	73	74	77	79	80	82	83	85	86	87	88	89	90	91	92	92	93	93	93
	≥29	78	80	82	83	84	86	87	88	88	89	90	91	91	92	92	93	93	93	94
19-28	0-3	52	56	59	62	66	68	71	73	76	78	80	82	83	85	86	88	89	89	90
	4-13	62	65	68	70	73	75	77	79	80	82	83	85	86	87	88	89	90	90	90
	14-28	70	72	74	76	78	80	81	82	84	85	86	87	88	89	89	90	91	91	91
	≥29	76	77	79	81	82	83	84	85	86	87	88	89	89	90	90	91	91	91	91
29-38	0-3	49	52	56	59	62	65	68	71	73	75	77	79	81	83	84	86	87	87	88
	4-13	59	61	64	67	70	72	74	76	78	79	81	82	84	85	86	87	88	88	89
	14-28	67	69	71	73	75	77	79	80	81	83	84	85	86	87	87	88	89	89	89
	≥29	73	75	76	78	79	81	82	83	84	85	86	86	87	88	88	89	89	89	89
39-49	0-3	44	48	52	55	59	62	65	67	70	72	75	77	79	81	82	84	85	86	86
	4-13	55	58	61	64	66	69	71	73	75	77	78	80	82	83	84	85	86	87	87
	14-28	63	65	68	70	72	74	76	77	79	80	81	82	83	84	85	86	87	87	87
	≥29	70	71	73	75	77	78	79	80	81	82	83	84	85	86	86	87	87	87	88
50-61	0-3	39	42	46	50	54	57	60	63	66	69	71	74	76	78	80	82	83	84	84
	4-13	50	53	56	59	62	65	67	70	72	74	76	77	79	81	82	83	84	85	85
	14-28	58	61	64	66	68	70	72	74	76	77	79	80	81	82	83	84	85	85	85
	≥29	65	67	70	71	73	75	76	78	79	80	81	82	83	83	84	85	85	86	86
62-73	0-3	32	36	40	44	48	52	55	59	62	65	68	70	73	75	78	80	82	82	83
	4-13	43	46	50	53	57	60	62	65	68	70	72	74	76	78	80	81	82	83	83
	14-28	52	55	58	61	63	66	68	70	72	74	75	77	78	80	81	82	83	83	84
	≥29	60	62	64	67	69	71	72	74	75	77	78	79	80	81	82	83	83	84	84
74-84	0-3	23	27	32	36	41	45	49	52	56	60	63	66	69	72	75	78	80	81	81
	4-13	34	37	41	45	49	53	56	59	62	65	67	70	72	75	77	79	80	81	81
	14-28	43	46	49	53	56	59	62	64	67	69	71	73	75	76	78	80	81	81	82
	≥29	51	53	56	59	62	64	66	68	70	72	74	75	77	78	79	80	81	81	82
85-93	0-3	14	18	23	28	32	37	41	45	50	54	58	61	65	69	72	76	78	80	80
	4-13	22	25	30	34	39	43	47	51	54	58	61	64	68	71	74	76	78	80	80
	14-28	29	32	37	41	45	48	52	55	58	61	64	67	70	72	75	77	78	80	80
	≥29	35	39	43	46	50	53	56	59	62	64	67	69	71	73	75	77	78	80	80
94-100	0-3	5	9	14	19	23	28	33	38	43	47	52	57	61	66	70	75	76	77	77
	4-13	7	11	16	21	26	31	35	40	44	49	53	58	62	66	70	75	76	77	77
	14-28	10	14	19	24	28	33	37	42	46	50	55	59	63	67	71	75	76	76	77
	≥29	12	16	21	26	31	35	39	44	48	52	56	60	64	67	71	75	76	76	76

FFMC **TABLE 2E**

Temperature: 20.5 - 25°C																			
		Rain Code or Yesterday's FFMC																	
RH (%)	Wind (km/h)	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
		FFMC																	
	0-3	93	94	94	94	94	95	95	95	95	96	96	96	96	96	97	97	98	98
	4-13	94	95	95	95	95	95	95	96	96	96	96	96	96	97	97	97	98	98
0-10	14-28	95	95	95	96	96	96	96	96	96	96	96	96	97	97	97	97	98	98
	≥ 29	96	96	96	96	96	96	96	96	96	96	97	97	97	97	97	97	98	98
	0-3	92	92	92	92	93	93	93	93	94	94	94	94	94	95	96	96	97	98
	4-13	93	93	93	93	93	93	94	94	94	94	94	94	95	95	96	96	97	97
11-18	14-28	93	93	93	94	94	94	94	94	94	94	94	94	95	95	96	96	97	97
	≥29	94	94	94	94	94	94	94	94	94	94	94	95	95	95	96	96	96	97
	0-3	90	90	90	91	91	91	91	92	92	92	92	93	94	94	95	95	96	96
	4-13	91	91	91	91	91	92	92	92	92	92	92	93	94	94	94	95	95	96
19-28	14-28	91	91	91	92	92	92	92	92	92	92	92	93	94	94	94	95	95	95
	≥29	92	92	92	92	92	92	92	92	92	92	92	93	94	94	94	94	95	95
	0-3	88	88	89	89	89	89	90	90	90	91	92	92	93	93	93	94	94	95
	4-13	89	89	89	89	90	90	90	90	90	91	92	92	92	93	93	93	93	94
29-38	14 28	89	89	89	90	90	90	90	90	90	91	92	92	92	92	93	93	93	93
	≥29	90	90	90	90	90	90	90	90	90	91	92	92	92	92	92	93	93	93
	0-3	86	87	87	87	88	88	88	89	90	90	90	91	91	91	92	92	92	93
	4-13	87	87	87	88	88	88	88	89	90	90	90	91	91	91	91	91	92	92
39-49	14-28	87	88	88	88	88	88	88	89	90	90	90	90	91	91	91	91	91	91
	≥29	88	88	88	88	88	88	88	89	90	90	90	90	90	90	91	91	91	91
	0-3	85	85	85	86	86	87	88	88	88	89	89	89	90	90	90	90	91	91
	4-13	85	85	86	86	86	87	88	88	88	88	89	89	89	89	89	90	90	90
50-61	14-28	86	86	86	86	86	87	88	88	88	88	88	89	89	89	89	89	89	89
	≥29	86	86	86	86	86	87	88	88	88	88	88	88	88	89	89	89	89	89
	0-3	83	84	84	85	86	86	86	87	87	87	87	88	88	88	88	88	89	89
	4-13	83	84	84	85	86	86	86	86	86	87	87	87	87	87	87	88	88	88
62-73	14-28	84	84	84	85	86	86	86	86	86	86	87	87	87	87	87	87	87	87
	≥ 29	84	84	84	85	86	86	86	86	86	86	86	86	86	87	87	87	87	87
	0-3	82	83	83	84	84	84	84	85	85	85	85	85	86	86	86	86	86	87
	4-13	82	83	83	84	84	84	84	84	84	85	85	85	85	85	85	85	86	86
74-84	14-28	82	83	83	84	84	84	84	84	84	84	84	84	85	85	85	85	85	85
	≥ 29	82	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	85
	0-3	81	81	81	81	81	82	82	82	82	82	83	83	83	83	83	84	84	84
	4-13	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	83	83	83
85-93	14-28	80	81	81	81	81	81	81	81	81	81	81	82	82	82	82	82	82	82
	≥29	80	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	82	82
	0-3	77	77	78	78	78	78	78	79	79	79	79	79	79	80	80	80	80	80
	4-13	77	77	77	77	77	78	78	78	78	78	78	78	78	79	79	79	79	79
94-100	14-28	77	77	77	77	77	77	77	77	77	77	78	78	78	78	78	78	78	78
	≥29	76	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77

FINE FUEL MOISTURE CODE

TABLE 2F

Temperature: 25.5-30°C

RH (%)	Wind (km/h)	Rain Code or Yesterday's FFMC: 0 | 2	3 | 7	8 | 12	13 | 17	18 | 22	23 | 27	28 | 32	33 | 37	38 | 42	43 | 47	48 | 52	53 | 57	58 | 62	63 | 67	68 | 72	73 | 77	78 | 79	80	81
		FFMC																		
0-10	0-3	66	69	72	74	77	79	81	83	84	86	87	89	90	91	92	93	94	94	95
	4-13	76	77	80	82	83	85	86	88	89	90	91	92	93	93	94	95	95	95	96
	14-28	82	84	85	87	88	89	90	91	92	92	93	94	94	95	95	96	96	96	96
	≥29	87	88	89	90	91	92	92	93	94	94	95	95	95	96	96	96	97	97	97
11-18	0-3	64	66	69	72	75	77	79	81	82	84	86	87	88	89	91	92	92	93	93
	4-13	73	75	78	79	81	83	84	86	87	88	89	90	91	91	92	93	93	94	94
	14-28	80	82	83	85	86	87	88	89	90	90	91	92	92	93	93	94	94	94	94
	≥29	85	86	87	88	89	90	90	91	92	92	93	93	93	94	94	94	95	95	95
19-28	0-3	61	64	67	69	72	74	76	78	80	82	83	85	86	87	89	90	90	91	91
	4-13	71	73	75	77	79	80	82	83	84	86	87	88	89	89	90	91	91	92	92
	14-28	78	79	81	82	83	85	86	87	87	88	89	90	90	91	91	92	92	92	92
	≥29	83	84	85	86	87	88	88	89	89	90	90	91	91	92	92	92	93	93	93
29-38	0-3	57	60	63	66	69	71	73	75	77	79	81	82	84	85	86	88	88	89	89
	4-13	67	69	72	74	76	77	79	81	82	83	84	85	86	87	88	89	89	90	90
	14-28	75	76	78	79	81	82	83	84	85	86	87	87	88	89	89	90	90	90	90
	≥29	80	81	82	83	84	85	86	86	87	88	88	89	89	90	90	90	90	91	91
39-49	0-3	52	55	59	62	65	67	70	72	74	76	78	80	81	83	84	86	87	87	87
	4-13	63	65	68	70	72	74	76	78	79	80	82	83	84	85	86	87	87	88	88
	14-28	71	73	74	76	78	79	80	81	82	83	84	85	86	86	87	88	88	88	88
	≥29	77	78	79	80	81	82	83	84	85	85	86	86	87	87	88	88	88	89	89
50-61	0-3	46	49	53	56	59	62	65	68	70	72	75	77	78	80	82	84	85	85	85
	4-13	57	60	63	65	68	70	72	74	76	77	79	80	81	83	84	85	85	86	86
	14-28	66	68	70	72	74	75	77	78	79	81	82	82	83	84	85	86	86	86	86
	≥29	73	74	76	77	78	79	80	81	82	83	83	84	85	85	86	86	86	87	87
62-73	0-3	38	41	45	49	53	56	59	62	65	68	70	73	75	77	79	81	83	83	83
	4-13	50	53	56	59	62	65	66	69	71	73	75	77	78	80	81	83	83	84	84
	14-28	60	62	64	67	69	71	73	74	76	77	78	79	81	82	82	83	84	84	84
	≥29	67	69	71	72	74	75	77	78	79	80	80	81	82	83	83	84	84	85	85
74-84	0-3	28	32	36	41	45	49	52	56	59	62	65	68	71	74	76	79	81	81	82
	4-13	40	43	47	51	54	57	60	63	65	68	70	72	74	76	78	80	81	82	82
	14-28	50	53	56	59	61	64	66	68	70	72	74	75	77	78	80	81	82	82	82
	≥29	58	60	63	65	67	69	71	72	74	75	76	77	79	80	80	81	82	82	82
85-93	0-3	17	21	26	30	35	39	43	48	52	55	59	63	66	70	73	76	79	80	81
	4-13	26	29	34	38	42	46	50	54	57	60	63	66	69	72	74	77	79	80	81
	14-28	34	37	42	45	49	52	56	59	61	64	67	69	71	74	76	78	79	80	81
	≥29	41	45	48	52	55	58	60	63	65	67	69	71	73	75	76	78	79	80	81
94-100	0-3	5	9	14	19	24	29	34	39	43	48	52	57	61	66	70	75	77	77	77
	4-13	9	13	18	22	27	32	36	41	45	50	54	58	63	67	71	75	77	77	77
	14-28	12	16	21	25	30	35	39	43	47	52	56	60	64	67	71	75	77	77	77
	≥29	15	19	24	28	33	37	41	45	49	53	57	61	64	68	71	75	77	77	77

FFMC **TABLE 2F**

Temperature: 25.5 - 30°C																			
		Rain Code or Yesterdav's FFMC																	
RH (%)	Wind (km/h)	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
		FFMC																	
0-10	0-3	95	95	95	95	95	96	96	96	96	96	97	97	97	97	97	97	98	99
	4-13	96	96	96	96	96	96	96	97	97	97	97	97	97	97	97	97	98	98
	14-28	96	96	96	97	97	97	97	97	97	97	97	97	97	97	97	97	98	98
	≥29	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	98	98
11-18	0-3	93	93	93	94	94	94	94	94	94	95	95	95	95	95	96	97	97	98
	4-13	94	94	94	94	94	94	95	95	95	95	95	95	95	95	96	97	97	97
	14-28	94	94	95	95	95	95	95	95	95	95	95	95	95	95	96	97	97	97
	≥29	95	95	95	95	95	95	95	95	95	95	95	95	95	95	96	97	97	97
19-28	0-3	91	91	92	92	92	92	92	92	93	93	93	93	94	95	95	96	96	96
	4-13	92	92	92	92	92	93	93	93	93	93	93	93	94	95	95	95	96	96
	14-28	92	92	93	93	93	93	93	93	93	93	93	93	94	95	95	95	95	95
	≥29	93	93	93	93	93	93	93	93	93	93	93	93	94	95	95	95	95	95
29-38	0-3	89	89	90	90	90	90	91	91	91	91	92	93	93	93	94	94	94	95
	4-13	90	90	90	90	90	91	91	91	91	91	92	93	93	93	93	94	94	94
	14-28	90	90	91	91	91	91	91	91	91	91	92	93	93	93	93	93	93	94
	≥29	91	91	91	91	91	91	91	91	91	91	92	93	93	93	93	93	93	93
39-49	0-3	87	88	88	88	88	89	89	89	90	91	91	91	92	92	92	92	93	93
	4-13	88	88	88	89	89	89	89	89	90	91	91	91	91	91	92	92	92	92
	14-28	88	89	89	89	89	89	89	89	90	91	91	91	91	91	91	91	92	92
	≥29	89	89	89	89	89	89	89	89	90	91	91	91	91	91	91	91	91	91
50-61	0-3	86	86	86	86	87	87	88	89	89	89	89	90	90	90	90	90	91	91
	4-13	86	86	87	87	87	87	88	89	89	89	89	89	89	90	90	90	90	90
	14-28	87	87	87	87	87	87	88	89	89	89	89	89	89	89	89	90	90	90
	≥29	87	87	87	87	87	87	88	89	89	89	89	89	89	89	89	89	89	89
62-73	0-3	84	84	85	85	86	87	87	87	87	87	88	88	88	88	88	88	89	89
	4-13	84	85	85	85	86	87	87	87	87	87	87	87	88	88	88	88	88	88
	14-28	85	85	85	85	86	87	87	87	87	87	87	87	87	87	87	87	88	88
	≥29	85	85	85	85	86	87	87	87	87	87	87	87	87	87	87	87	87	87
74-84	0-3	82	83	84	84	84	85	85	85	85	85	85	86	86	86	86	86	86	87
	4-13	82	83	84	84	84	85	85	85	85	85	85	85	85	85	85	86	86	86
	14-28	82	83	84	84	84	84	84	85	85	85	85	85	85	85	85	85	85	85
	≥29	82	83	84	84	84	84	84	84	85	85	85	85	85	85	85	85	85	85
85-93	0-3	81	81	81	82	82	82	82	82	82	83	83	83	83	83	83	83	83	84
	4-13	81	81	81	81	82	82	82	82	82	82	82	82	82	82	82	83	83	83
	14-28	81	81	81	81	81	81	82	82	82	82	82	82	82	82	82	82	82	82
	≥29	81	81	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	82
94-100	0-3	77	78	78	78	78	78	78	78	79	79	79	79	79	79	79	79	80	80
	4-13	77	77	77	78	78	78	78	78	78	78	78	78	78	78	78	79	79	79
	14-28	77	77	77	77	77	77	77	77	78	78	78	78	78	78	78	78	78	78
	≥ 29	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	78	78	78

FINE FUEL MOISTURE CODE

TABLE 2G

Temperature: 30.5-35°C

RH (%)	Wind (km/h)	Rain Code or Yesterday's FFMC: 0 | 2	3 | 7	8 | 12	13 | 17	18 | 22	23 | 27	28 | 32	33 | 37	38 | 42	43 | 47	48 | 52	53 | 57	58 | 62	63 | 67	68 | 72	73 | 77	78 | 79	80	81
		FFMC																		
0-10	0-3	75	77	79	81	83	84	86	87	89	90	91	92	93	94	94	95	96	96	96
	4-13	83	85	86	87	89	90	91	91	92	93	94	94	95	95	96	96	97	97	97
	14-28	89	90	91	91	92	93	94	94	95	95	95	96	96	96	97	97	97	97	97
	≥29	92	93	94	94	94	95	95	96	96	96	96	97	97	97	97	97	97	98	98
11-18	0-3	73	75	77	79	81	83	84	85	87	88	89	90	91	92	93	93	94	94	94
	4-13	81	83	84	85	87	88	89	90	90	91	92	92	93	94	94	95	95	95	95
	14-28	87	88	89	90	90	91	92	92	93	93	94	94	94	95	95	95	95	95	96
	≥29	90	91	92	92	93	93	93	94	94	94	95	95	95	95	95	96	96	96	96
19-28	0-3	69	72	74	76	78	80	82	83	84	86	87	88	89	90	91	91	92	92	92
	4-13	78	80	82	83	84	85	86	87	88	89	90	90	91	92	92	93	93	93	93
	14-28	84	85	86	87	88	89	89	90	91	91	91	92	92	93	93	93	93	93	94
	≥29	88	89	89	90	90	91	91	92	92	92	93	93	93	93	93	94	94	94	94
29-38	0-3	65	68	70	73	75	77	78	80	82	83	84	85	86	87	88	89	90	90	90
	4-13	75	77	78	80	81	83	84	85	86	86	87	88	89	89	90	90	91	91	91
	14-28	81	82	84	85	85	86	87	88	88	89	89	90	90	90	91	91	91	91	91
	≥29	85	86	87	87	88	89	89	89	90	90	90	91	91	91	91	91	92	92	92
39-49	0-3	60	63	66	68	71	73	75	77	78	80	81	83	84	85	86	87	88	88	88
	4-13	71	73	75	76	78	79	81	82	83	84	85	86	86	87	88	88	89	89	89
	14-28	78	79	80	81	83	83	84	85	86	86	87	87	88	88	89	89	89	89	89
	≥29	82	83	84	85	85	86	87	87	87	88	88	88	89	89	89	89	90	90	90
50-61	0-3	53	56	60	63	65	68	70	72	74	76	78	79	81	82	84	85	86	86	86
	4-13	65	67	70	72	74	75	77	78	79	81	82	83	84	85	85	86	87	87	87
	14-28	73	75	76	78	79	80	81	82	83	84	84	85	85	86	86	87	87	87	87
	≥29	79	80	81	82	82	83	84	84	85	85	86	86	86	87	87	87	88	88	88
62-73	0-3	45	48	52	55	58	61	64	67	69	71	73	76	77	79	81	83	84	84	84
	4-13	58	60	63	65	68	70	72	74	75	77	78	79	81	82	83	84	85	85	85
	14-28	67	69	71	73	74	76	77	78	79	80	81	82	83	83	84	85	85	85	85
	≥29	74	75	76	77	78	79	80	81	82	82	83	83	84	84	85	85	85	85	86
74-84	0-3	33	37	41	45	49	53	56	59	62	65	68	71	73	75	78	80	81	82	82
	4-13	47	50	53	56	59	62	65	67	69	71	73	75	77	78	80	81	82	82	83
	14-28	57	60	62	65	67	69	71	72	74	75	77	78	79	80	81	82	83	83	83
	≥29	65	67	69	71	72	74	75	76	77	78	79	80	80	81	82	82	83	83	83
85-93	0-3	20	24	29	33	38	42	46	50	54	57	61	64	68	71	74	77	79	80	81
	4-13	31	34	39	43	46	50	54	57	60	63	66	68	71	73	76	78	79	80	81
	14-28	40	43	47	51	54	57	60	62	65	67	69	71	73	75	77	78	80	80	81
	≥29	48	51	54	57	60	62	64	67	68	70	72	73	75	76	78	79	80	80	81
94-100	0-3	6	10	15	20	25	30	35	39	44	49	53	57	62	66	70	75	78	78	78
	4-13	10	14	19	24	29	33	38	42	47	51	55	59	63	67	71	75	78	78	78
	14-28	14	18	23	27	32	36	41	45	49	53	57	61	64	68	71	75	78	78	78
	≥29	18	22	26	31	35	39	44	48	51	55	59	62	65	69	72	75	78	78	78

FFMC **TABLE 2G**

Temperature: 30.5 – 35°C																			
		Rain Code or Yesterdav's FFMC																	
RH (%)	Wind (km/h)	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
		FFMC																	
0-10	0-3	96	96	96	96	97	97	97	97	97	97	97	97	98	98	98	98	98	99
	4-13	97	97	97	97	97	97	97	97	97	98	98	98	98	98	98	98	98	99
	14-28	97	97	97	97	97	98	98	98	98	98	98	98	98	98	98	98	98	99
	≥29	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	99
11-18	0-3	94	95	95	95	95	95	95	95	95	96	96	96	96	96	96	97	97	98
	4-13	95	95	95	95	95	96	96	96	96	96	96	96	96	96	96	97	97	98
	14-28	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	97	97	98
	≥29	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	97	97	98
19-28	0-3	92	93	93	93	93	93	93	93	94	94	94	94	94	95	96	96	96	97
	4-13	93	93	93	93	94	94	94	94	94	94	94	94	94	95	96	96	96	96
	14-28	94	94	94	94	94	94	94	94	94	94	94	94	94	95	96	96	96	96
	≥29	94	94	94	94	94	94	94	94	94	94	94	94	94	95	96	96	96	96
29-38	0-3	91	91	91	91	91	91	91	92	92	92	92	93	94	94	94	94	95	95
	4-13	91	91	91	91	92	92	92	92	92	92	92	93	94	94	94	94	94	94
	14-28	92	92	92	92	92	92	92	92	92	92	92	93	94	94	94	94	94	94
	≥29	92	92	92	92	92	92	92	92	92	92	92	93	94	94	94	94	94	94
39-49	0-3	89	89	89	89	89	89	90	90	90	91	92	92	92	92	92	93	93	93
	4-13	89	89	89	90	90	90	90	90	90	91	92	92	92	92	92	92	92	93
	14-28	90	90	90	90	90	90	90	90	90	91	92	92	92	92	92	92	92	92
	≥29	90	90	90	90	90	90	90	90	90	91	92	92	92	92	92	92	92	92
50-61	0-3	87	87	87	87	88	88	88	89	90	90	90	90	90	90	91	91	91	91
	4-13	87	87	87	88	88	88	88	89	90	90	90	90	90	90	90	90	90	90
	14-28	88	88	88	88	88	88	88	89	90	90	90	90	90	90	90	90	90	90
	≥29	88	88	88	88	88	88	88	89	90	90	90	90	90	90	90	90	90	90
62-73	0-3	85	85	85	86	86	87	88	88	88	88	88	88	88	88	89	89	89	89
	4-13	85	85	85	86	86	87	88	88	88	88	88	88	88	88	88	88	88	88
	14-28	85	86	86	86	86	87	87	88	88	88	88	88	88	88	88	88	88	88
	≥29	86	86	86	86	86	87	87	88	88	88	88	88	88	88	88	88	88	88
74-84	0-3	83	83	84	85	85	85	85	85	86	86	86	86	86	86	86	86	86	87
	4-13	83	83	84	85	85	85	85	85	85	85	86	86	86	86	86	86	86	86
	14-28	83	83	84	85	85	85	85	85	85	85	85	85	85	85	85	86	86	86
	≥29	83	83	84	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
85-93	0-3	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	84
	4-13	82	82	82	82	82	82	82	82	82	82	82	83	83	83	83	83	83	83
	14-28	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82
	≥29	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82
94-100	0-3	78	78	78	78	78	78	79	79	79	79	79	79	79	79	79	79	79	79
	4-13	78	78	78	78	78	78	78	78	78	78	78	78	78	78	79	79	79	79
	14-28	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78
	> 29	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78

FINE FUEL MOISTURE CODE

TABLE 2H

Temperature: > 35.5°C

RH (%)	Wind (km/h)	Rain Code or Yesterday's FFMC: 0 | 2	3 | 7	8 | 12	13 | 17	18 | 22	23 | 27	28 | 32	33 | 37	38 | 42	43 | 47	48 | 52	53 | 57	58 | 62	63 | 67	68 | 72	73 | 77	78 | 79	80	81
		FFMC																		
0-10	0-3	83	84	86	87	88	90	91	91	92	93	94	94	95	96	96	97	97	97	97
	4-13	90	90	91	92	93	94	94	95	95	96	96	96	97	97	97	97	98	98	98
	14-28	94	94	95	95	95	96	96	96	97	97	97	97	98	98	98	98	98	98	98
	≥29	96	96	96	97	97	97	97	97	98	98	98	98	98	98	98	98	98	98	98
11-18	0-3	81	82	84	85	87	88	89	90	91	91	92	93	93	94	95	95	95	96	96
	4-13	88	89	90	90	91	92	92	93	93	94	94	95	95	95	96	96	96	96	96
	14-28	92	92	93	93	94	94	95	95	95	95	96	96	96	96	96	96	97	97	97
	≥29	94	94	95	95	95	95	96	96	96	96	96	96	96	97	97	97	97	97	97
19-28	0-3	78	79	81	83	84	85	86	87	88	89	90	91	91	92	93	93	93	94	94
	4-13	85	86	87	88	89	90	90	91	91	92	92	93	93	93	94	94	94	94	94
	14-28	90	90	91	91	92	92	92	93	93	93	94	94	94	94	94	94	95	95	95
	≥29	92	92	93	93	93	93	94	94	94	94	94	94	94	95	95	95	95	95	95
29-38	0-3	74	75	77	79	81	82	83	84	86	86	87	88	89	90	90	91	91	92	92
	4-13	82	83	84	85	86	87	88	88	89	89	90	90	91	91	92	92	92	92	92
	14-28	87	87	88	89	89	90	90	90	91	91	91	92	92	92	92	92	93	93	93
	≥29	90	90	90	91	91	91	91	92	92	92	92	92	92	92	93	93	93	93	93
39-49	0-3	68	70	73	75	77	78	80	81	82	83	85	86	86	87	88	89	89	90	90
	4-13	78	79	81	82	83	84	85	85	86	87	87	88	88	89	89	90	90	90	90
	14-28	84	84	85	86	86	87	87	88	88	89	89	89	90	90	90	90	90	91	91
	≥29	87	87	88	88	88	89	89	89	90	90	90	90	90	90	90	91	91	91	91
50-61	0-3	62	64	67	69	71	73	75	77	78	80	81	82	83	85	86	86	87	87	88
	4-13	73	74	76	77	79	80	81	82	83	84	85	85	86	87	87	88	88	88	88
	14-28	80	81	82	82	83	84	85	85	86	86	87	87	87	88	88	88	88	88	88
	≥29	84	84	85	85	86	86	86	87	87	87	88	88	88	88	88	88	89	89	89
62-73	0-3	52	55	58	61	64	67	69	71	73	75	77	78	80	81	83	84	85	85	85
	4-13	65	67	70	71	73	75	76	78	79	80	81	82	83	84	84	85	86	86	86
	14-28	74	75	77	78	79	80	81	82	82	83	83	84	85	85	85	86	86	86	86
	≥29	79	80	81	82	82	83	83	84	84	85	85	85	85	86	86	86	86	86	86
74-84	0-3	40	43	47	51	54	57	60	63	66	68	71	73	75	77	79	81	82	83	83
	4-13	54	57	60	62	65	67	69	71	73	74	76	77	79	80	81	82	83	83	84
	14-28	65	66	69	70	72	74	75	76	77	78	79	80	81	82	82	83	84	84	84
	≥29	72	73	74	76	77	78	79	79	80	81	81	82	82	83	83	84	84	84	84
85-93	0-3	24	28	33	37	41	45	49	53	56	60	63	66	69	72	75	78	79	80	81
	4-13	36	40	44	48	51	54	57	60	63	66	68	70	73	75	77	79	80	80	81
	14-28	47	50	53	56	59	61	64	66	68	70	72	74	75	77	78	79	80	81	81
	≥29	56	58	60	63	65	67	69	70	72	73	75	76	77	78	79	80	80	81	81
94-100	0-3	8	12	17	22	26	31	36	40	45	49	54	58	62	67	71	75	78	78	78
	4-13	12	16	21	26	31	35	40	44	48	52	56	60	64	68	71	75	78	78	78
	14-28	17	21	25	30	34	39	43	47	51	55	58	62	65	69	72	75	78	78	78
	>29	21	25	30	34	38	42	46	50	54	57	60	64	67	70	73	75	78	78	78

FFMC **TABLE 2H**

Temperature: > 35.5°C																			
		Rain Code or Yesterday's FFMC																	
RH (%)	Wind (km/h)	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
		FFMC																	
	0-3	97	97	97	97	98	98	98	98	98	98	98	98	98	98	98	98	98	99
	4-13	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	99
0-10	14-28	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	99	99
	≥29	98	98	98	98	98	98	98	98	98	98	98	98	98	98	99	99	99	99
	0-3	96	96	96	96	96	96	96	96	96	96	97	97	97	97	97	97	98	98
	4-13	96	96	96	96	96	97	97	97	97	97	97	97	97	97	97	97	98	98
11-18	14-28	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	98	98
	≥29	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	98	98
	0-3	94	94	94	94	94	94	94	94	95	95	95	95	95	95	96	96	97	97
	4-13	94	94	94	95	95	95	95	95	95	95	95	95	95	95	96	96	97	97
19-28	14-28	95	95	95	95	95	95	95	95	95	95	95	95	95	95	96	96	97	97
	≥29	95	95	95	95	95	95	95	95	95	95	95	95	95	95	96	96	97	97
	0-3	92	92	92	92	92	92	92	93	93	93	93	93	94	95	95	95	95	95
	4-13	92	92	92	93	93	93	93	93	93	93	93	93	94	94	95	95	95	95
29-38	14-28	93	93	93	93	93	93	93	93	93	93	93	93	94	94	95	95	95	95
	≥29	93	93	93	93	93	93	93	93	93	93	93	93	94	94	95	95	95	95
	0-3	90	90	90	90	90	90	91	91	91	91	92	93	93	93	93	93	93	93
	4-13	90	90	90	91	91	91	91	91	91	91	92	93	93	93	93	93	93	93
39-49	14-28	91	91	91	91	91	91	91	91	91	91	92	93	93	93	93	93	93	93
	≥29	91	91	91	91	91	91	91	91	91	91	92	93	93	93	93	93	93	93
	0-3	88	88	88	88	88	89	89	89	90	90	91	91	91	91	91	91	91	91
	4-13	88	88	88	89	89	89	89	89	90	90	91	91	91	91	91	91	91	91
50-61	14-28	89	89	89	89	89	89	89	89	90	90	91	91	91	91	91	91	91	91
	≥29	89	89	89	89	89	89	89	89	90	90	91	91	91	91	91	91	91	91
	0-3	86	86	86	86	86	87	88	88	88	89	89	89	89	89	89	89	89	89
	4-13	86	86	86	86	87	87	88	88	88	88	88	89	89	89	89	89	89	89
62-73	14-28	86	86	87	87	87	87	88	88	88	88	88	88	88	88	89	89	89	89
	≥29	87	87	87	87	87	87	88	88	88	88	88	88	88	88	88	88	88	88
	0-3	83	84	84	85	86	86	86	86	86	86	86	86	86	87	87	87	87	87
	4-13	84	84	84	85	86	86	86	86	86	86	86	86	86	86	86	86	86	86
74-84	14-28	84	84	84	85	86	86	86	86	86	86	86	86	86	86	86	86	86	86
	≥29	84	84	84	85	86	86	86	86	86	86	86	86	86	86	86	86	86	86
	0-3	82	83	83	83	83	83	83	83	83	83	83	83	83	83	83	84	84	84
	4-13	82	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83
85-93	14-28	82	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83
	≥29	82	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83
	0-3	78	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79
	4-13	78	78	78	78	78	79	79	79	79	79	79	79	79	79	79	79	79	79
94-100	14-28	78	78	78	78	78	78	78	78	78	78	78	78	78	79	79	79	79	79
	> 29	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78

DMC AND DC DRYING FACTORS **TABLE 4**

Temp (°C)	RH (%)	DMC Drying Factor	DC Drying Factor
≤5	0-100	1	2
5.5-10	0-52	1	3
	53-100	0	
10.5-15	0-42	2	3
	43-73	1	
	74-100	0	
15.5-20	0-32	3	4
	33-52	2	
	53-73	1	
	74-100	0	
20.5-25	0-32	3	5
	33-52	2	
	53 73	2	
	74-100	1	
25.5-30	0-27	4	6
	28-42	3	
	43-58	2	
	59-73	2	
	74-100	1	
30.5-35	0-22	5	7
	23-37	4	
	38-53	3	
	54-68	2	
	69-100	1	
≥ 35.5	0-17	6	8
	18-29	5	
	30-41	4	
	42-53	3	
	54-65	3	
	66-100	1	

INITIAL SPREAD INDEX

TABLE 6

Wind (km/h)	FFMC 0 | 32	33 | 37	38 | 42	43 | 47	48 | 52	53 | 57	58 | 62	63 | 67	68 | 72	73 | 77	78 | 79	80	81	82	83	84
	ISI															
0	0	0	0	0	0	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.5	1.5	1.5	2.0
1	0	0	0	0	0	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.5	1.5	1.5	2.0
2	0	0	0	0	0	0.5	0.5	0.5	0.5	1.0	1.0	1.5	1.5	1.5	2.0	2.0
3	0	0	0	0	0	0.5	0.5	0.5	0.5	1.0	1.0	1.5	1.5	1.5	2.0	2.0
4	0	0	0	0	0	0.5	0.5	0.5	1.0	1.0	1.0	1.5	1.5	1.5	2.0	2.5
5	0	0	0	0	0	0.5	0.5	0.5	1.0	1.0	1.5	1.5	1.5	2.0	2.0	2.5
6	0	0	0	0	0	0.5	0.5	0.5	1.0	1.0	1.5	1.5	1.5	2.0	2.0	2.5
7	0	0	0	0	0	0.5	0.5	1.0	1.0	1.0	1.5	1.5	2.0	2.0	2.5	2.5
8	0	0	0	0	0	0.5	0.5	1.0	1.0	1.0	1.5	1.5	2.0	2.0	2.5	3
9	0	0	0	0	0.5	0.5	0.5	1.0	1.0	1.0	1.5	2.0	2.0	2.0	2.5	3
10	0	0	0	0	0.5	0.5	0.5	1.0	1.0	1.5	1.5	2.0	2.0	2.5	2.5	3
11	0	0	0	0	0.5	0.5	0.5	1.0	1.0	1.5	1.5	2.0	2.0	2.5	3	3
12	0	0	0	0	0.5	0.5	0.5	1.0	1.0	1.5	2.0	2.0	2.5	2.5	3	3
13	0	0	0	0	0.5	0.5	1.0	1.0	1.0	1.5	2.0	2.0	2.5	2.5	3	4
14	0	0	0	0	0.5	0.5	1.0	1.0	1.5	1.5	2.0	2.5	2.5	3	3	4
15	0	0	0	0	0.5	0.5	1.0	1.0	1.5	1.5	2.0	2.5	2.5	3	3	4
16	0	0	0	0	0.5	0.5	1.0	1.0	1.5	1.5	2.0	2.5	3	3	4	4
17	0	0	0	0	0.5	0.5	1.0	1.0	1.5	2.0	2.5	2.5	3	3	4	4
18	0	0	0	0	0.5	0.5	1.0	1.5	1.5	2.0	2.5	3	3	4	4	5
19	0	0	0	0	0.5	0.5	1.0	1.5	1.5	2.0	2.5	3	3	4	4	5
20	0	0	0	0	0.5	1.0	1.0	1.5	1.5	2.0	2.5	3	3	4	4	5
21	0	0	0	0	0.5	1.0	1.0	1.5	2.0	2.0	3	3	4	4	5	5
22	0	0	0	0	0.5	1.0	1.0	1.5	2.0	2.5	3	3	4	4	5	6
23	0	0	0	0.5	0.5	1.0	1.5	1.5	2.0	2.5	3	4	4	5	5	6
24	0	0	0	0.5	0.5	1.0	1.5	2.0	2.0	2.5	3	4	4	5	5	6
25	0	0	0	0.5	0.5	1.0	1.5	2.0	2.0	2.5	3	4	4	5	6	6
26	0	0	0	0.5	0.5	1.0	1.5	2.0	2.5	3	4	4	5	5	6	7
27	0	0	0	0.5	0.5	1.0	1.5	2.0	2.5	3	4	4	5	6	6	7
28	0	0	0	0.5	0.5	1.0	1.5	2.0	2.5	3	4	5	5	6	7	8
29	0	0	0	0.5	0.5	1.0	2.0	2.5	2.5	3	4	5	5	6	7	8
30	0	0	0	0.5	0.5	1.5	2.0	2.5	3	3	4	5	6	6	7	8
31	0	0	0	0.5	1.0	1.5	2.0	2.5	3	4	5	5	6	7	8	9
32	0	0	0	0.5	1.0	1.5	2.0	2.5	3	4	5	6	6	7	8	9
33	0	0	0	0.5	1.0	1.5	2.0	3	3	4	5	6	7	8	9	10
34	0	0	0	0.5	1.0	1.5	2.5	3	3	4	5	6	7	8	9	10
35	0	0	0	0.5	1.0	1.5	2.5	3	4	4	6	7	7	8	9	11
36	0	0	0	0.5	1.0	1.5	2.5	3	4	5	6	7	8	9	10	11
37	0	0	0	0.5	1.0	2.0	2.5	3	4	5	6	7	8	9	10	12
38	0	0	0	0.5	1.0	2.0	3	4	4	5	7	8	9	10	11	12
39	0	0	0	0.5	1.0	2.0	3	4	4	5	7	8	9	10	12	13
40	0	0	0.5	0.5	1.0	2.0	3	4	5	6	7	9	10	11	12	14
41	0	0	0.5	0.5	1.5	2.0	3	4	5	6	8	9	10	11	13	15
42	0	0	0.5	0.5	1.5	2.5	3	4	5	6	8	9	11	12	13	15
43	0	0	0.5	0.5	1.5	2.5	4	5	5	7	9	10	11	12	14	16
44	0	0	0.5	1.0	1.5	2.5	4	5	6	7	9	10	12	13	15	17
45	0	0	0.5	1.0	1.5	2.5	4	5	6	7	9	11	12	14	16	18
46	0	0	0.5	1.0	1.5	3	4	5	6	8	10	12	13	14	16	19
47	0	0	0.5	1.0	2.0	3	4	6	7	8	11	12	14	15	17	20
48	0	0	0.5	1.0	2.0	3	5	6	7	9	11	13	14	16	18	21
49	0	0	0.5	1.0	2.0	3	5	6	7	9	12	13	15	17	19	22
50	0	0	0.5	1.0	2.0	3	5	7	8	10	12	14	16	18	20	23

ISI **TABLE 6**

Wind (km/h)	FFMC 85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
	ISI														
0	2.0	2.5	3	3	4	4	5	6	7	8	9	10	11	13	15
1	2.0	2.5	3	3	4	5	5	6	7	8	9	10	12	14	16
2	2.5	2.5	3	4	4	5	5	6	7	8	10	11	13	14	16
3	2.5	3	3	4	4	5	6	7	8	9	10	12	13	15	17
4	2.5	3	3	4	5	5	6	7	8	9	11	12	14	16	18
5	2.5	3	4	4	5	6	6	7	8	10	11	13	15	17	19
6	3	3	4	4	5	6	7	8	9	10	12	13	15	18	20
7	3	3	4	5	5	6	7	8	9	11	12	14	16	18	21
8	3	4	4	5	6	6	7	9	10	11	13	15	17	19	22
9	3	4	4	5	6	7	8	9	10	12	14	16	18	20	23
10	3	4	5	5	6	7	8	9	11	12	14	16	19	21	24
11	4	4	5	6	6	7	9	10	11	13	15	17	20	23	26
12	4	4	5	6	7	8	9	10	12	14	16	18	21	24	27
13	4	5	5	6	7	8	10	11	13	15	17	19	22	25	28
14	4	5	6	7	8	9	10	12	13	15	18	20	23	26	30
15	4	5	6	7	8	9	11	12	14	16	18	21	24	28	31
16	5	5	6	7	8	10	11	13	15	17	19	22	25	29	33
17	5	6	7	8	9	10	12	13	15	18	20	23	27	31	35
18	5	6	7	8	9	11	12	14	16	19	21	25	28	32	37
19	5	6	7	8	10	11	13	15	17	20	23	26	30	34	38
20	6	7	8	9	10	12	14	16	18	21	24	27	31	36	40
21	6	7	8	9	11	12	14	16	19	22	25	29	33	37	43
22	6	7	8	10	11	13	15	17	20	23	26	30	34	39	45
23	7	8	9	10	12	14	16	18	21	24	28	32	36	41	47
24	7	8	9	11	12	14	17	19	22	25	29	33	38	43	50
25	7	9	10	11	13	15	17	20	23	27	31	35	40	46	52
26	8	9	10	12	14	16	18	21	24	28	32	37	42	48	55
27	8	9	11	13	14	17	19	22	26	29	34	39	44	51	58
28	9	10	11	13	15	18	20	23	27	31	35	41	47	53	61
29	9	10	12	14	16	18	21	25	28	33	37	43	49	56	64
30	10	11	13	15	17	19	22	26	30	34	39	45	51	59	67
31	10	12	13	15	18	20	24	27	31	36	41	47	54	62	70
32	11	12	14	16	19	22	25	29	33	38	43	50	57	65	74
33	11	13	15	17	20	23	26	30	35	40	46	52	60	68	78
34	12	13	15	18	21	24	27	32	36	42	48	55	63	72	82
35	12	14	16	19	22	25	29	33	38	44	51	58	66	76	86
36	13	15	17	20	23	26	30	35	40	46	53	61	70	80	91
37	14	16	18	21	24	28	32	37	42	49	56	64	73	84	95
38	14	16	19	22	25	29	34	39	45	51	59	67	77	88	100
39	15	17	20	23	27	31	35	41	47	54	62	71	81	92	105
40	16	18	21	24	28	32	37	43	49	57	65	74	85	97	111
41	17	19	22	25	29	34	39	45	52	60	68	78	90	102	117
42	17	20	23	27	31	36	41	47	54	63	72	82	94	108	123
43	18	21	24	28	32	37	43	50	57	66	76	87	99	113	129
44	19	22	26	30	34	39	45	52	60	69	79	91	104	119	136
45	20	23	27	31	36	41	48	55	63	73	84	96	110	125	143
46	21	25	28	33	38	44	50	58	67	77	88	101	115	132	150
47	23	26	30	34	40	46	53	61	70	81	92	106	121	138	158
48	24	27	31	36	42	48	56	64	74	85	97	111	127	146	166
49	25	29	33	38	44	51	58	67	78	89	102	117	134	153	175
50	26	30	35	40	46	53	61	71	82	94	108	123	141	161	184

BUILDUP INDEX **TABLE 7**

DMC	DC													
	0 | 19	20 | 39	40 | 59	60 | 79	80 | 99	100 | 119	120 | 139	140 | 159	160 | 179	180 | 199	200 | 224	225 | 249	250 | 274	275 | 299
	BUI													
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2	3	3	4	4	4	4	4	4	4	4	4	4	4	4
3	3	5	5	5	6	6	6	6	6	6	6	6	6	6
4	4	6	7	7	7	7	7	7	8	8	8	8	8	8
5	5	7	8	8	9	9	9	9	9	9	9	9	10	10
6	6	8	9	10	10	11	11	11	11	11	11	11	11	11
7	7	9	10	11	12	12	12	13	13	13	13	13	13	13
8	8	10	11	12	13	14	14	14	14	14	15	15	15	15
9	9	10	12	14	14	15	15	16	16	16	16	16	17	17
10	10	11	13	15	16	16	17	17	17	18	18	18	18	18
11	11	11	14	16	17	18	18	19	19	19	19	20	20	20
12	12	12	15	17	18	19	19	20	20	21	21	21	22	22
13	13	13	16	18	19	20	21	21	22	22	23	23	23	23
14	13	14	16	19	20	21	22	23	23	24	24	24	25	25
15-16	15	15	17	20	22	23	24	25	25	26	26	27	27	27
17-18	17	17	19	21	24	25	26	27	28	28	29	30	30	30
19-20	19	19	20	23	25	27	28	29	30	31	32	32	33	33
21-22	21	21	21	24	27	29	30	32	33	33	34	35	36	36
23-24	23	23	23	25	28	31	32	34	35	36	37	38	38	39
25-27	25	26	26	27	30	33	35	36	38	39	40	41	42	42
28-30	28	29	29	29	32	35	37	39	41	42	43	44	45	46
31-33	31	32	32	32	34	37	40	42	43	45	46	48	49	50
34-36	34	34	35	35	35	39	42	44	46	48	50	51	52	54
37-39	37	37	38	38	38	41	44	46	49	51	52	54	56	57
40-43	41	41	41	41	41	43	46	49	51	54	56	58	59	61
44-47	44	45	45	45	45	45	48	52	54	57	59	61	63	65
48-51	48	49	49	49	49	49	51	54	57	60	63	65	67	69
52-55	52	53	53	53	53	53	53	56	60	63	66	68	71	73
56-60	57	57	57	58	58	58	58	59	63	66	69	72	75	77
61-65	62	62	62	62	63	63	63	63	65	69	72	76	79	81
66-70	67	67	67	67	68	68	68	68	68	72	75	79	82	85
71-75	72	72	72	72	72	73	73	73	73	74	78	82	86	89
76-81	77	77	77	78	78	78	78	78	78	78	82	86	90	93
82-87	83	83	83	84	84	84	84	84	84	84	85	89	94	97
88-93	89	89	89	89	90	90	90	90	90	90	90	93	97	101
94-100	95	95	96	96	96	96	96	97	97	97	97	97	101	105
101-107	102	102	102	103	103	103	103	103	104	104	104	104	104	109
108-115	109	110	110	110	110	110	111	111	111	111	111	111	111	113
116-124	118	118	118	118	119	119	119	119	119	119	120	120	120	120
125-134	127	127	127	128	128	128	128	128	129	129	129	129	129	129
135-145	137	137	138	138	138	138	139	139	139	139	139	139	140	140
146-157	148	149	149	149	149	150	150	150	150	150	151	151	151	151
158-170	160	161	161	161	162	162	162	162	162	163	163	163	163	163
171-186	174	175	175	175	176	176	176	176	177	177	177	177	177	178
187-205	191	192	192	192	193	193	193	193	194	194	194	194	195	195
206-228	212	212	212	213	213	213	214	214	214	214	215	215	215	215
229-256	236	237	237	237	238	238	238	239	239	239	239	240	240	240
257-290	266	266	267	267	267	268	268	268	269	269	269	270	270	270
291-332	302	303	303	304	304	304	305	305	305	306	306	306	307	307
333-384	347	347	348	348	349	349	350	350	350	351	351	352	352	352
385-448	402	402	403	403	404	404	405	405	406	406	407	407	408	408

BUI **TABLE 7**

DMC	DC													
	300 | 329	330 | 359	360 | 399	400 | 439	440 | 489	490 | 539	540 | 599	600 | 659	660 | 729	730 | 809	810 | 899	900 | 999	1000 | 1099	1100 | 1199
	BUI													
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2	4	4	4	4	4	4	4	4	4	4	4	4	4	4
3	6	6	6	6	6	6	6	6	6	6	6	6	6	6
4	8	8	8	8	8	8	8	8	8	8	8	8	8	8
S	10	10	10	10	10	10	10	10	10	10	10	10	10	10
6	11	11	12	12	12	12	12	12	12	12	12	12	12	12
7	13	13	13	13	13	14	14	14	14	14	14	14	14	14
8	15	15	15	15	15	15	15	16	16	16	16	16	16	16
9	17	17	17	17	17	17	17	17	17	17	18	18	18	18
10	19	19	19	19	19	19	19	19	19	19	19	19	20	20
11	20	20	20	21	21	21	21	21	21	21	21	21	21	21
12	22	22	22	22	23	23	23	23	23	23	23	23	23	23
13	24	24	24	24	24	24	25	25	25	25	25	25	25	25
14	25	25	26	26	26	26	26	27	27	27	27	27	27	27
15-16	28	28	28	28	29	29	29	29	29	30	30	30	30	30
17-18	31	31	31	32	32	32	33	33	33	33	33	33	34	34
19-20	34	34	35	35	35	36	36	36	36	37	37	37	37	37
21-22	37	37	38	38	39	39	39	40	40	40	40	41	41	41
23-24	40	40	41	41	42	42	43	43	43	44	44	44	45	45
25-27	43	44	44	45	46	46	47	47	48	48	48	49	49	49
28-30	47	48	49	49	50	51	51	52	53	53	53	54	54	55
31-33	51	52	53	54	55	55	56	57	57	58	59	59	59	60
34-36	55	56	57	58	59	60	61	61	62	63	63	64	65	65
37-39	58	60	61	62	63	64	65	66	67	68	68	69	70	70
40-43	62	64	65	67	68	69	70	71	72	73	74	75	76	76
44-47	67	68	70	72	73	75	76	77	78	79	80	81	82	83
48-51	71	73	74	76	78	80	81	83	84	85	86	88	89	89
52-55	75	77	79	81	83	85	87	88	90	91	93	94	95	96
56-60	79	82	84	86	88	90	92	94	96	98	99	101	102	103
61-65	84	86	89	92	94	96	99	101	103	105	106	108	110	111
66-70	88	91	94	97	100	102	105	107	109	111	113	115	117	118
71-75	92	95	98	102	105	108	111	113	116	118	120	122	124	126
76-81	97	100	103	107	110	114	117	120	122	125	128	130	132	134
82-87	101	105	108	112	116	120	123	127	130	133	136	138	141	143
88-93	105	109	113	118	122	126	130	133	137	140	143	146	149	151
94-100	110	114	118	123	127	132	136	140	144	148	151	155	158	160
101-107	114	119	123	128	133	138	143	147	151	155	159	163	167	170
108-115	118	123	128	134	139	145	150	155	159	164	168	172	176	179
116-124	123	128	133	140	146	152	157	163	168	173	178	182	187	190
125-134	129	134	139	146	153	159	165	171	177	182	188	193	198	202
135-145	140	140	145	153	160	167	173	180	186	192	199	205	210	215
146-157	151	151	151	159	167	175	182	189	196	203	210	217	223	228
158-170	164	164	164	166	174	183	191	199	206	214	222	229	236	242
171-186	178	178	178	178	182	191	200	209	217	226	235	243	250	257
187-205	195	195	195	196	196	201	211	220	230	239	249	259	267	275
206-228	216	216	216	216	217	217	222	233	244	255	265	276	286	295
229-256	240	241	241	241	242	242	242	247	259	271	284	296	307	318
257-290	271	271	271	272	272	272	273	273	276	290	304	318	331	343
291-332	307	308	308	309	309	310	310	311	311	311	326	342	358	371
333-384	353	353	354	354	355	355	356	356	357	358	358	369	387	403
385-448	408	409	409	410	411	411	412	413	414	414	415	416	418	437

FIRE WEATHER INDEX

TABLE 8

ISI	BUI																	
	0 | 1	2 | 3	4 | 5	6 | 7	8 | 9	10 | 11	12 | 14	15 | 17	18 | 20	21 | 23	24 | 26	27 | 30	31 | 34	35 | 38	39 | 42	43 | 47	48 | 52	53 | 57
	FWI																	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.5	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
1.0	0	0	0	0	1	1	1	1	1	1	1	2	2	2	2	3	3	3
1.5	0	0	1	1	1	1	1	2	2	2	3	3	3	4	4	4	5	5
2.0	0	1	1	1	1	2	2	3	3	3	4	4	4	5	5	6	6	6
2.5	1	1	1	2	2	3	3	3	4	4	5	5	6	6	6	7	7	8
3	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9
4	1	2	3	3	4	4	5	6	6	7	7	8	9	9	10	10	11	12
5	2	2	4	4	5	6	6	7	8	8	9	10	10	11	12	13	13	14
6	2	3	4	5	6	7	7	8	9	10	10	11	12	13	14	14	15	16
7	3	4	5	6	7	8	8	9	10	11	12	13	14	15	15	16	17	18
8	3	4	6	7	8	9	10	11	11	12	13	14	15	16	17	18	19	20
9	4	5	7	8	9	9	10	12	13	14	14	15	17	18	19	20	21	22
10	4	5	7	8	9	10	11	13	14	15	16	17	18	19	20	21	22	23
11	5	6	8	9	10	11	12	14	15	16	17	18	19	20	21	23	24	25
12	5	6	9	10	11	12	13	15	16	17	18	19	20	22	23	24	25	27
13	6	7	9	11	12	13	14	15	17	18	19	20	22	23	24	25	27	28
14	6	7	10	11	12	14	15	16	18	19	20	21	23	24	25	27	28	29
15-16	7	8	11	12	13	15	16	18	19	20	22	23	25	26	27	29	30	32
17-18	7	9	12	13	15	16	18	19	21	22	24	25	27	28	30	31	33	34
19-20	8	10	13	15	16	17	19	21	23	24	25	27	29	30	32	33	35	37
21-22	9	10	14	16	17	19	21	22	24	26	27	29	31	32	34	36	37	39
23-24	9	11	15	17	18	20	22	24	26	27	29	31	33	34	36	38	40	41
25-26	10	12	16	18	20	21	23	25	27	29	31	32	34	36	38	40	42	44
27-29	11	13	17	19	21	23	25	27	29	31	33	35	37	39	40	42	44	46
30-32	12	14	18	21	23	24	27	29	31	33	35	37	39	41	43	45	47	49
33-35	13	15	19	22	24	26	28	31	33	35	37	39	41	44	46	48	50	52
36-38	14	16	21	23	26	28	30	33	35	37	39	41	44	46	48	50	53	55
39-42	15	17	22	25	27	29	32	35	37	39	41	44	46	49	51	53	56	58
43-46	16	18	24	26	29	31	34	37	39	42	44	47	49	52	54	57	59	62
47-51	17	20	25	28	31	33	36	39	42	44	47	49	52	55	57	60	63	66
52-57	18	21	27	30	33	36	39	42	45	48	50	53	56	59	61	64	67	70
58-64	20	23	29	33	36	39	42	45	48	51	54	57	60	63	66	69	72	75
65-72	22	25	32	35	39	42	45	48	52	55	58	61	64	67	70	74	77	80
73-81	23	27	34	38	42	45	48	52	56	59	62	65	69	72	75	79	82	86
82-91	25	29	37	41	45	48	52	56	60	63	67	70	74	77	81	84	88	92
92-102	28	31	40	44	48	52	56	60	64	68	71	75	79	83	86	90	94	98
103-114	30	34	43	48	52	55	60	64	69	73	76	80	84	88	92	96	100	104
115-128	32	37	46	51	56	59	64	69	73	78	81	86	90	94	98	103	107	111
129-144	35	39	50	55	60	64	69	74	79	83	87	92	96	101	105	110	114	119
145-163	38	43	53	59	64	69	74	79	84	89	93	98	103	108	113	117	122	127
164-185	41	46	58	64	69	74	79	85	91	96	100	106	111	116	121	126	131	136

FWI **TABLE 8**

ISI	BUI 58 | 63	64 | 69	70 | 75	76 | 82	83 | 89	90 | 97	98 | 106	107 | 116	117 | 128	129 | 142	143 | 159	160 | 180	181 | 206	207 | 238	239 | 277	278 | 324	325 | 381	≥382
	FWI																	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.5	1	1	1	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3
1.0	3	4	4	4	4	5	5	5	6	6	6	7	7	7	7	7	7	7
1.5	5	6	6	6	7	7	7	8	8	9	9	9	10	10	10	10	10	10
2.0	7	7	8	8	9	9	10	10	11	11	12	12	12	12	13	13	13	13
2.5	8	9	9	10	10	11	12	12	13	13	14	14	15	15	15	15	15	15
3	10	10	11	11	12	13	13	14	15	15	16	16	17	17	17	17	17	17
4	12	13	14	14	15	16	17	17	18	19	20	20	21	21	21	21	21	21
5	15	15	16	17	18	19	20	20	21	22	23	24	24	25	25	25	25	25
6	17	18	19	20	20	21	22	23	24	25	26	27	28	28	28	28	28	28
7	19	20	21	22	23	24	25	26	27	28	29	30	31	31	31	32	32	32
8	21	22	23	24	25	26	27	28	30	31	32	33	33	34	34	34	35	35
9	23	24	25	26	27	28	30	31	32	33	34	35	36	37	37	37	37	37
10	24	26	27	28	29	30	32	33	34	36	37	38	39	39	40	40	40	40
11	26	27	29	30	31	33	34	35	37	38	39	40	41	42	42	42	42	42
12	28	29	30	32	33	34	36	37	39	40	41	43	44	44	45	45	45	45
13	29	31	32	33	35	36	38	39	41	42	44	45	46	47	47	47	47	47
14	31	32	34	35	37	38	40	41	43	44	46	47	48	49	49	49	49	50
15-16	33	34	36	38	39	41	42	44	46	47	49	50	51	52	52	53	53	53
17-18	36	37	39	41	42	44	46	48	49	51	53	54	55	56	56	57	57	57
19-20	38	40	42	44	45	47	49	51	53	55	56	58	59	60	60	61	61	61
21-22	41	43	44	46	48	50	52	54	56	58	60	61	63	64	64	64	64	64
23-24	43	45	47	49	51	53	55	57	59	61	63	65	66	67	68	68	68	68
25-26	45	47	49	52	54	56	58	60	62	64	66	68	69	70	71	71	71	71
27-29	48	50	52	55	57	59	61	64	66	68	70	72	73	74	75	75	75	76
30-32	51	54	56	58	60	63	65	68	70	72	74	76	78	79	80	80	80	80
33-35	54	57	59	62	64	66	69	71	74	76	79	81	82	83	84	84	85	85
36-38	57	60	62	65	67	70	73	75	78	80	83	85	86	88	88	89	89	89
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43-46	64	67	70	72	75	78	81	84	87	89	92	94	96	98	98	99	99	99
47-51	68	71	74	77	80	83	86	89	92	95	97	100	102	103	104	104	105	105
52-57	72	76	79	82	85	88	91	94	97	101	103	106	108	110	110	111	111	111
58-64	77	81	84	87	90	94	97	101	104	107	110	113	115	117	118	118	118	118
65-72	83	86	90	93	97	100	104	107	111	114	118	121	123	125	126	126	126	126
73-81	89	92	96	100	103	107	111	115	119	122	126	129	131	133	134	135	135	135
82-91	95	99	103	107	111	114	118	123	127	130	134	137	140	142	143	143	144	144
92-102	101	106	110	114	118	122	126	131	135	139	143	146	149	151	152	153	153	153
103-114	108	113	117	121	126	130	134	139	143	148	152	155	158	160	162	162	163	163
115-128	115	120	124	129	134	138	143	148	153	157	162	165	168	171	172	173	173	173
129-144	123	128	133	138	143	147	153	158	163	167	172	176	179	182	183	184	184	184
145-163	132	137	142	147	152	158	163	168	174	179	184	188	191	194	195	196	196	196
164-185	141	147	152	157	163	169	174	180	186	191	196	201	204	207	209	209	210	210

Monthly Fire Weather Record

Month	Year	Station	Prov./State	Elevation m	Observer

Day	Temp (°C) Dry Bulb	Temp (°C) Wet Bulb	RH % Relative Humidity	Wind Direction	Wind (km/h) Speed	Rain (mm) 24 Hour	FFMC 1 Rain Code	FFMC 2 FFM Code	DMC 3 Rain Code	DMC 4 Drying Factor	DMC Duff Moisture Code	DC 5 Rain Code	DC 6 Drying Factor	DC Drought Code	ISI 7 Initial Spread Index	BUI 8 Buildup Index	FWI 9 Fire Weather Index
30/31																	
1																	
2																	
3																	
4																	
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Total																	

APPENDIX: EQUATORIAL LATITUDE ADJUSTMENTS FOR THE DMC & DC

The drying phases of the DMC and DC are sensitive to the daylength, which is a function of the latitude and time of year. For the DMC, this is captured in the month-varying Effective Daylength (L_e), and for the DC, by the Daylength factor (L_f). The standard monthly values for both the L_e and L_f for Canada from Van Wagner (1985) were based on a reference latitude of 46°N.

Daylength values were adjusted in 1992 for use at other latitudes by the Canadian Forest Service Fire Danger Group[1]. For the DMC, monthly L_e values were determined for 3 additional reference latitudes: 20°N, 20°S and 40°N based on differences in the length of day. These values are shown in Table 1, along with the standard reference latitude values for 46°N. For the DC, monthly L_f values were determined for the Northern and Southern hemisphere. The standard Canadian values for 46°N were used for the Northern hemisphere. The Southern hemisphere values were determined by assuming that the July value for Canada corresponds to the January value in the Southern hemisphere, that the August value for Canada corresponds to the February value in the Southern hemisphere and so on. These values are shown in Table 2.

TABLE 1: EFFECTIVE DAYLENGTHS (L_E) FOR THE DUFF MOISTURE CODE (DMC) FOR REFERENCED LATITUDES

	MONTH											
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
46°N[1]	6.5	7.5	9.0	12.8	13.9	13.9	12.4	10.9	9.4	8.0	7.0	6.0
20°N[2]	7.9	8.4	8.9	9.5	9.9	10.2	10.1	9.7	9.1	8.6	8.1	7.8
20°S[2]	10.1	9.6	9.1	8.5	8.1	7.8	7.9	8.3	8.9	9.4	9.9	10.2
40°S[2]	11.5	10.5	9.2	7.9	6.8	6.2	6.5	7.4	8.7	10.0	11.2	11.8

1. Standard Canadian values from Van Wagner and Picket 1985.
2. Obtained by subtracting three hours (as per Van Wagner 1970) from the mean duration of daylight during each month based on calculations made for the respective reference latitude.

[1] Contact M.E. (Marty) Alexander, Senior Fire Behavior Research Officer, Canadian Forest Service, Northern Foresty Centre. malexand@nrcan.gc.ca, (780) 435-7346.

TABLE 2: EFFECTIVE DAYLENGTH FACTORS (L_F) FOR THE DROUGHT CODE (DC)

	MONTH											
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
North[1]	-1.6	-1.6	-1.6	0.9	3.8	5.8	6.4	5	2.4	0.4	-1.6	-1.6
South[2]	6.4	5	2.4	0.4	-1.6	-1.6	-1.6	-1.6	-1.6	0.9	3.8	5.8

1. Standard Canadian values from Van Wagner and Picket 1985.
2. Obtained by assuming that the value derived for the month of July used in Canada (Van Wagner and Pickett, 1985) is deemed applicable to the month of January in the Southern Hemisphere, etc.

For use in Indonesia and Malaysia, constant equatorial factors were determined for both the DMC and DC. The constant values captured the fact that at the equator, the daylengths do not vary sufficiently throughout the year to warrant the use of time-varying L_e or L_f values. The equatorial L_e constant for the DMC was determined by taking the averages of monthly values L_e for the 20°N reference latitude (9.02) and for the 20°S latitude (8.98), and then taking the average of these two values. The result then for the DMC was a constant L_e of 9.0. The equatorial L_f for the DC was determined similarly. The average L_e for both hemispheres was 1.39, which was used as the constant L_e value.

REFERENCES

Van Wagner, C.E. and T.L. Pickett. 1985. Equations and FORTRAN Program for the Canadian Forest Fire Weather Index System. *Can. For. Serv. Technical Report 33, Ottawa.*

Appendix 2

Initial Fire Report Form

Initial Fire Report Form

Report Number_____ Date___ /___ / ___ Time_____:___

Person Reporting Fire:_____ Phone No._____

Fire Tower Number:_____

Person Taking Report:_____
Office:_____

Location Zone_____ Block_____
Compartment_____

Description_____
_

_____

Direction of fire:

What is burning?

Size of fire o Bigger	o Campfire	o House	o Football Field
Type of fire	o Smoldering	o Open Flame	o Fast Moving
Landform	o Flat	o Moderate	o Steep
Water availability	o Yes	o No	Distance: _____ meters
Distance to driving (Road):	_____meters		
Is anyone fighting fire?	o Yes	o No	
Are home/building threatened?	o Yes	o No	

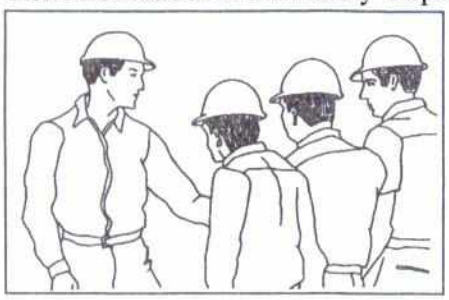
Comments/action taken:

APPENDIX 3

FIRE SUPPRESSION GUIDELINE

Fire suppression can be dangerous work. Therefore, at the fire site, sound safety procedures and practice are extremely important.

The Fire Leader is ultimately responsible for crew safety.



The Fire Leader establishes a safe working environment, ensure that fire fighters are aware and trained in correct safety procedure before being sent to fire line, and makes sure that fighters work in a safe manner at all times.

Three basic fire suppression rules:

1. Fast Initial Attack – Be organized, move crew to the fires as quickly as possible, and stop the fire from spreading.

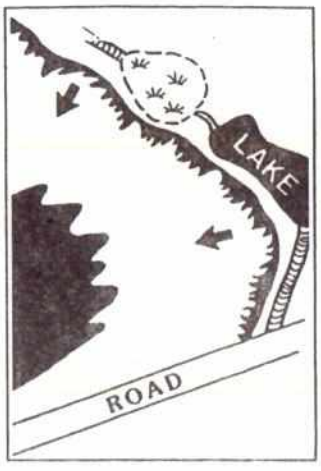
2. Aggressive Action – Deploy adequate resources, work hard and work quickly to bring the fire under control.

3. Prompt and Complete Mop-up – If the fire is contained, a thorough mop-up must commence immediately.

FIRE SUPPRESSION METHODS

Indirect Method

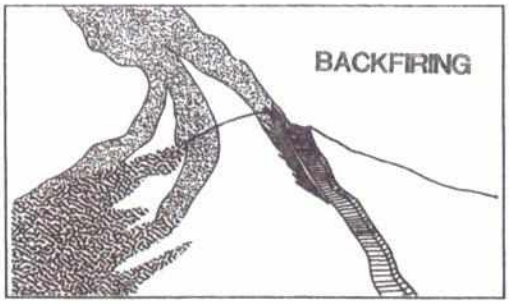
A method whereby the fireline is strategically located to take advantage of favorable terrain and natural barriers or breaks well in advance of a fast moving fire perimeter. Used as last resort and always under the direction of a senior experienced Fire Leader, a "backfire" is set to stop the advancing fire.



It is an attack method wherein a Fire is set by the fire crew along the inside edge of the control line or natural barrier, to consume unburned fuels between the line and the fire perimeter.

Burning off is a limited, small scale, routine operation as opposed to "backfiring".

Backfiring

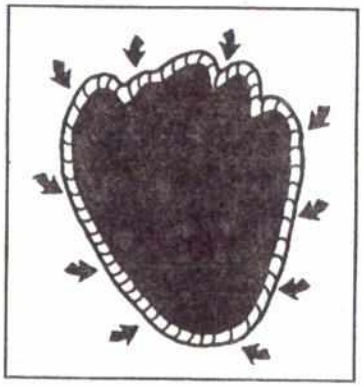


This is a form of "indirect attack" where extensive fire is set along the inner edge of control line or natural barrier.

Used in more extreme situations, the line is situated some distance from the fire and with the assistance of wind, drawn to the main fire by convection, and consumes fuel in its path. As a result, this procedure halts or retards the progress of the fire.

Direct method

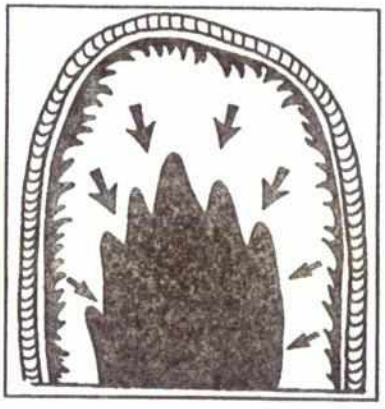
This attack method is normally used to suppress a slow moving fire. The fire line is constructed adjacent to burning fuel. The fire is attacked and suppressed immediately.



Parallel Method

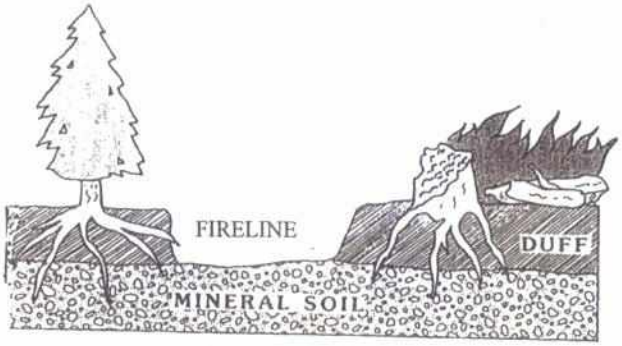
This method is applied in situations where a fire is spreading fairly rapidly.

The fireline is constructed as close to the fire as heat and flames permit. This technique helps to control the fire rather than immediately stopping (Direct Method) it. It reinforces the line and speeds up the control effort by consuming or "burning off" fuel between the fireline and the fire perimeter.



FIRELINE

The fire fighter's chief job is to construct the fireline. The fire fighter digs below the surface of the ground to mineral layer of soil. This procedure clears fuels (punk, dry leaves and duff including roots) and prevents the fire from spreading.

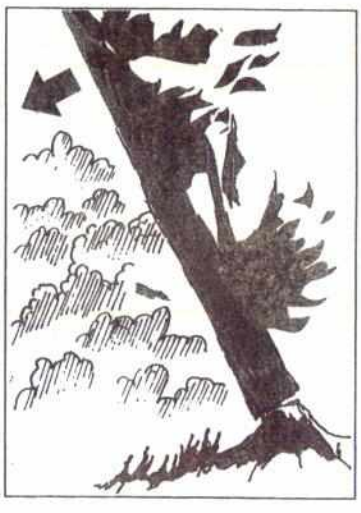


The depth of the fireline depends on fuel and soil type plus the size of the fire.

On average, the fireline is not more than 30-60 cm wide. The depth of the line is always to the mineral layer of the soil.

Points to remember when constructing a fireline

- Deals first with those areas from where the fire is likely to escape (e.g., hot spots).
- When possible keep the fireline short.
- Avoid sharp angles.
- Existing natural or man-made barriers such as roads, ridges, creeks, etc., should be used when available.
- When possible, construct fireline through open areas rather than fighting through dense or heavy fuels.
- Pay attention to normal daily wind shifts.



- Where possible, block off the more hazardous fuels as blowdowns or logging slash by leaving them outside the fireline.
- Encircle areas of numerous spot fires if fireline construction around each spot is impractical.
- Dig a V-trench to catch rolling fuels. Turn logs and chunks parallel with slope to keep them from rolling across the fireline.
- Beware of snags. They are highly flammable. Lines should be dug far from

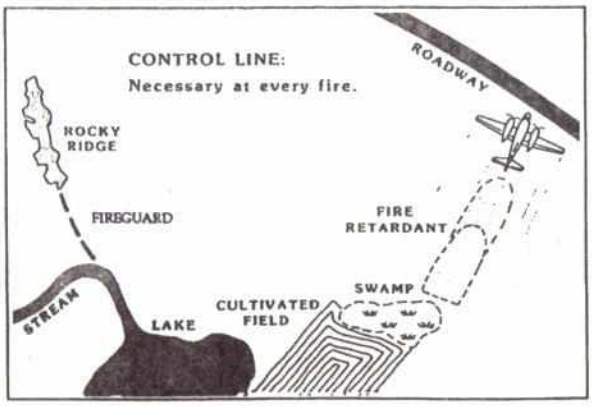
burning snags, so when felled, the snag and any flying debris drops within the fireline perimeter. Remove and drop snags in the opposite direction and on both sides of the fire lines, 60-100 meters inside the 15 meters outside. If it is not possible to fall the snag, remove all fuel around its base. This procedure is called "rigging the fire"

- Complete the control line by linking section of fireline and when possible, tie in existing barriers.

Fireline construction varies. Lines are sometimes placed on the fire perimeter or edge, while in other situation, well ahead of the blaze.

Correct application depends on various factors including complexity of the fire and the overall attack plan which was determined during size-up.

CONTROL LINE



A control line is necessary at every fire. The control line may be a combination of man-made firelines or natural fire barriers (e.g., rivers).

The term "fireguard", used historically, is not accepted today. Correct terminology is "firelines" referring to man-made lines and control line is used to describe a combination of barriers of completed firelines.

Basic Attack Procedures

- Place spotters at strategic points to look out for spot fires and fast-running fingers from the main fire. Attempt to put out spot fires before they become large.

- Grass or tree needles lead fire to heavy fuel. Throw soil or spray water on the fire edge or scrape a narrow fireline immediately against the fire edge.

- Logs may roll and scatter fires. Turn logs to lie up and down the slope or block them with rocks to prevent them from rolling away. Dig trenches below logs that may

roll. Chip fire from the outside logs. Roll logs out of hot coal bed to reduce burning.

- Piles of limbs and logs cause high-intensity burning and may shoot flames and sparks high into the air. Separate piles, cool them down with soil, and build a fireline around them.
- Take prompt action on all vital areas. Do not become bogged down at one location and allow the fire to escape elsewhere.

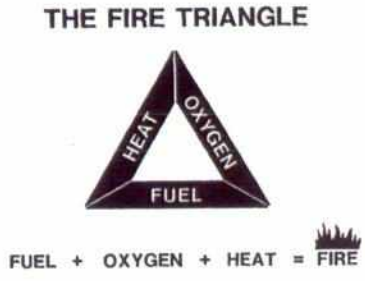
- Falling snags can be extremely hazardous. When it is necessary to fall snags, always let a trained faller do it.

- Low-hanging limbs along the fireline may lead fires to crowns. Cut them off and remove fuel from beneath the trees. Small trees that crown should be cut down and removed.

- "Hot-spotting" is moving from one "hot-spot" (intense area of fire" to another and making them safe as you go. Start by cooling down hot spots with soil or water is available, then separate fuels, knock down low-hanging limbs, and dig a narrow fireline around the hot spots.

The basic approach to successful fire suppression is to attack where the fire is most likely to escape.

Three ways to attack a fire



Remove the fuel by cutting a path or trail between the fuel supply and fire.

Remove oxygen by shoveling soil on spots.

Remove the heat by applying water at the base of the flame.

RECONNAISSANCE (OR SIZE-UP)

The first thing the Fire Leader does on arriving at the fire site is reconnaissance (preliminary inspection) or size-up the situation. This involves an immediate survey of the area to gain useful information. The Fire Leader needs this information in order to decide on how and where the initial attack begins.

The Fire Leader will:

- Not the exact time of arrival;

- Quick size-up the job;
- Form an appropriate plan of attack and make sure his/her crew clearly understand it;
- Select escape routes and make the crew aware of them; and
- Post a lookout to avoid possible danger.

Sizing-up a small fire can be done quickly, by walking around the perimeter (outer edge or boundary) surrounding the fire or, by viewing the situation from a vantage point. During the sizing-up process the Fire Leader considers various factors that influence the attack plan (e.g., types of fuel, weather and topography).

Size-up is an ongoing process. An alert Fire leader recognizes that fires are not stable. They are easily influenced (e.g., a change in wing direction). He/she is, therefore, constantly reviewing (sizing-up) the situation and adapting the attack plan to deal with new complications.

Source: Sabah Forestry Department Forest Fire Prevention and Control Organization – Forest Fire Team Training Standard - Trainee Manual

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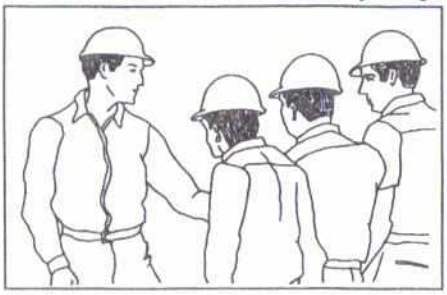

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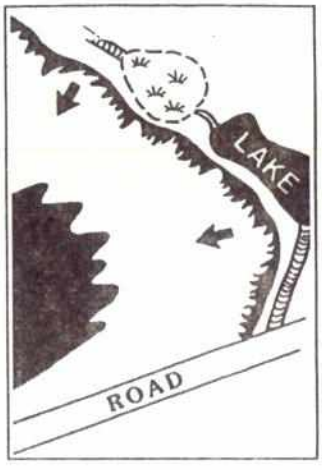

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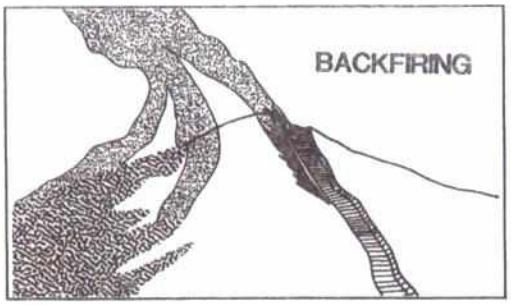
Burning off is a limited, small scale, routine operation as opposed to "backfiring".

Backfiring

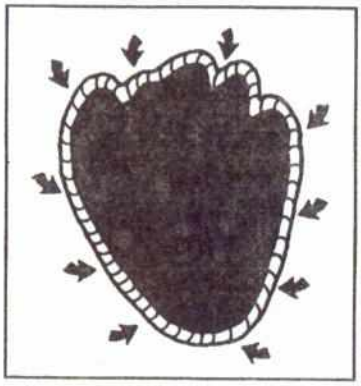


This is a form of "indirect attack" where extensive fire is set along the inner edge of control line or natural barrier.

Used in more extreme situations, the line is situated some distance from the fire and with the assistance of wind, drawn to the main fire by convection, and consumes fuel in its path. As a result, this procedure halts or retards the progress of the fire.

Direct method

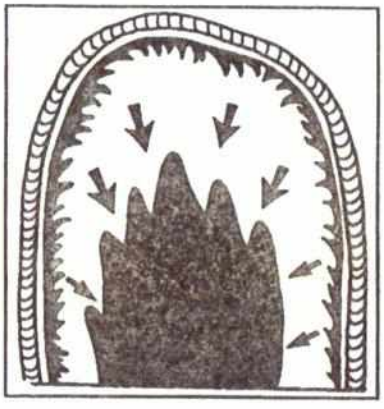
This attack method is normally used to suppress a slow moving fire. The fire line is constructed adjacent to burning fuel. The fire is attacked and suppressed immediately.



Parallel Method

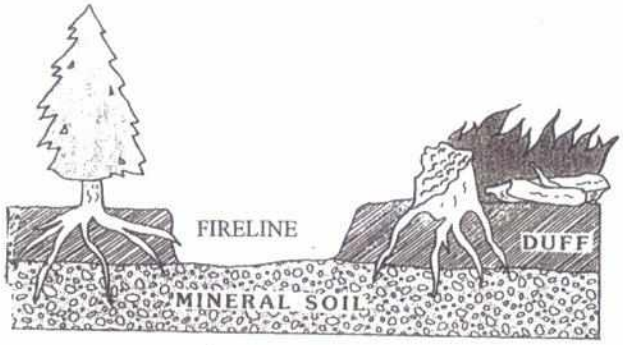
This method is applied in situations where a fire is spreading fairly rapidly.

The fireline is constructed as close to the fire as heat and flames permit. This technique helps to control the fire rather than immediately stopping (Direct Method) it. It reinforces the line and speeds up the control effort by consuming or "burning off" fuel between the fireline and the fire perimeter.



FIRELINE

The fire fighter's chief job is to construct the fireline. The fire fighter digs below the surface of the ground to mineral layer of soil. This procedure clears fuels (punk, dry leaves and duff including roots) and prevents the fire from spreading.



The depth of the fireline depends on fuel and soil type plus the size of the fire.

On average, the fireline is not more than 30-60 cm wide. The depth of the line is always to the mineral layer of the soil.

Points to remember when constructing a fireline

- Deals first with those areas from where the fire is likely to escape (e.g., hot spots).
- When possible keep the fireline short.
- Avoid sharp angles.
- Existing natural or man-made barriers such as roads, ridges, creeks, etc., should be used when available.
- When possible, construct fireline through open areas rather than fighting through dense or heavy fuels.
- Pay attention to normal daily wind shifts.

- Where possible, block off the more hazardous fuels as blowdowns or logging slash by leaving them outside the fireline.
- Encircle areas of numerous spot fires if fireline construction around each spot is impractical.
- Dig a V-trench to catch rolling fuels. Turn logs and chunks parallel with slope to keep them from rolling across the fireline.
- Beware of snags. They are highly flammable. Lines should be dug far from

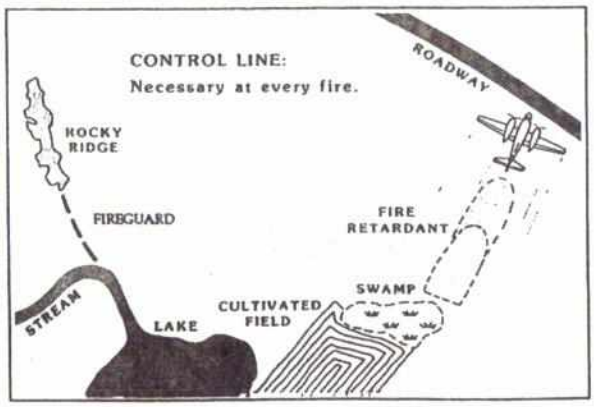
burning snags, so when felled, the snag and any flying debris drops within the fireline perimeter. Remove and drop snags in the opposite direction and on both sides of the fire lines, 60-100 meters inside the 15 meters outside. If it is not possible to fall the snag, remove all fuel around its base. This procedure is called "rigging the fire"

- Complete the control line by linking section of fireline and when possible, tie in existing barriers.

Fireline construction varies. Lines are sometimes placed on the fire perimeter or edge, while in other situation, well ahead of the blaze.

Correct application depends on various factors including complexity of the fire and the overall attack plan which was determined during size-up.

CONTROL LINE



A control line is necessary at every fire. The control line may be a combination of man-made firelines or natural fire barriers (e.g., rivers).

The term "fireguard", used historically, is not accepted today. Correct terminology is "firelines" referring to man-made lines and control line is used to describe a combination of barriers of completed firelines.

Basic Attack Procedures

- Place spotters at strategic points to look out for spot fires and fast-running fingers from the main fire. Attempt to put out spot fires before they become large.

- Grass or tree needles lead fire to heavy fuel. Throw soil or spray water on the fire edge or scrape a narrow fireline immediately against the fire edge.

- Logs may roll and scatter fires. Turn logs to lie up and down the slope or block them with rocks to prevent them from rolling away. Dig trenches below logs that may

roll. Chip fire from the outside logs. Roll logs out of hot coal bed to reduce burning.

- Piles of limbs and logs cause high-intensity burning and may shoot flames and sparks high into the air. Separate piles, cool them down with soil, and build a fireline around them.
- Take prompt action on all vital areas. Do not become bogged down at one location and allow the fire to escape elsewhere.

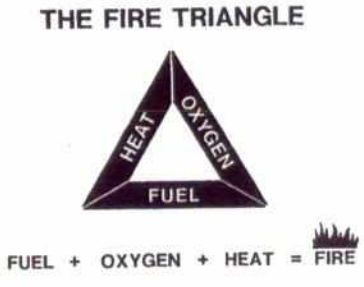
- Falling snags can be extremely hazardous. When it is necessary to fall snags, always let a trained faller do it.

- Low-hanging limbs along the fireline may lead fires to crowns. Cut them off and remove fuel from beneath the trees. Small trees that crown should be cut down and removed.

- "Hot-spotting" is moving from one "hot-spot" (intense area of fire" to another and making them safe as you go. Start by cooling down hot spots with soil or water is available, then separate fuels, knock down low-hanging limbs, and dig a narrow fireline around the hot spots.

The basic approach to successful fire suppression is to attack where the fire is most likely to escape.

Three ways to attack a fire



Remove the fuel by cutting a path or trail between the fuel supply and fire.

Remove oxygen by shoveling soil on spots.

Remove the heat by applying water at the base of the flame.

RECONNAISSANCE (OR SIZE-UP)

The first thing the Fire Leader does on arriving at the fire site is reconnaissance (preliminary inspection) or size-up the situation. This involves an immediate survey of the area to gain useful information. The Fire Leader needs this information in order to decide on how and where the initial attack begins.

The Fire Leader will:

- Not the exact time of arrival;

- Quick size-up the job;
- Form an appropriate plan of attack and make sure his/her crew clearly understand it;
- Select escape routes and make the crew aware of them; and
- Post a lookout to avoid possible danger.

Sizing-up a small fire can be done quickly, by walking around the perimeter (outer edge or boundary) surrounding the fire or, by viewing the situation from a vantage point. During the sizing-up process the Fire Leader considers various factors that influence the attack plan (e.g., types of fuel, weather and topography).

Size-up is an ongoing process. An alert Fire leader recognizes that fires are not stable. They are easily influenced (e.g., a change in wing direction). He/she is, therefore, constantly reviewing (sizing-up) the situation and adapting the attack plan to deal with new complications.

Source: Sabah Forestry Department Forest Fire Prevention and Control Organization – Forest Fire Team Training Standard - Trainee Manual