

CHAPTER 24

Fire Protection

1. FOREST FIRE IN RAJASTHAN

- 1.1.** Fire is one of the major destructive agents of the forests. Fire renders the trees prone to insect and fungal attack. It destroys young regeneration, resulting in loss of time in its establishment. The physical properties of the soil deteriorate through loss of human and organic matter, thereby exposing soil to the desiccating influences of sun and wind. Forest fires are of four types viz. ground fire, surface fire, crown fire and sub-surface fire.
- 1.2.** In Rajasthan, most of the fires are ground fires, which normally do not cause permanent damage to the forest tree crop, but they tend to reduce the density of the stocking and destroy invaluable wildlife habitat.
- 1.3.** Forest fire incidents often occur during the period from March to the onset of monsoon season when the grasses and shrubs get dried and leaf fall takes place from main tree species which are deciduous in nature. Some fires occur in winter months also, particularly when drought is prolonged. The fire incidence is the maximum in protected areas, plantations and closures wherein the grasses grow tall and dense.
- 1.4. Causes of forest fire**
 - 1.4.1.** Forest fire is caused by men either due to carelessness or intentionally. Fires due to carelessness are caused by:-
 - 1.4.1.1.** Leaving fire lighted by cart men or travellers passing through the forests.
 - 1.4.1.2.** Throwing burning matchstick or "Bidi" or cigarette stubs in the forest.
 - 1.4.1.3.** Carelessly throwing burning torches used for scaring away the bees while collecting honey.

- 1.4.1.4. Accidental spread offered in the forest while burning fire lines departmentally.
- 1.4.1.5. Careless cleaning and burning around grass 'bagars' stacked inside the forest by villagers.
- 1.4.2. Deliberate and intentional fires are caused by:-
 - 1.4.2.1. Burning the undergrowth and grass to collect minor forest produce such as mahua flowers, horns etc., which otherwise are not visible.
 - 1.4.2.2. Burning the grass by graziers to induce better flush of growth.
 - 1.4.2.3. The offenders for destroying the evidence of fresh illicitly felled trees in the forests.
 - 1.4.2.4. Tribals because of local religious beliefs.
- 1.4.3. Besides above, there may be accidental fires due to:-
 - 1.4.3.1. Throwing of sparks by locomotives while passing through the forests
 - 1.4.3.2. Short circuiting on electric transmission lines passing through forest area.
 - 1.4.3.3. Generating heat due to friction in bamboo forests.
 - 1.4.3.4. Producing sparks by rocks hitting each other during disturbances like upheavals, avalanches and blasting etc.

1.5. Fire prone/ sensitive areas

- 1.5.1. In Rajasthan, during the last 11 years 218 fire incidents have been reported. In these incidents 13386.47 ha area is reported to have been affected. About 6816 sq. km. forest area has been identified as potentially fire prone area in the State. This area falls in Ajmer, Alwar, Banswara, Baran, Bharatpur (Ghana), Bundi, Chittorgarh, Dholpur, Dungarpur, Jaipur, Jalore, Kota, Pali, Sawaimadhopur, Sirohi and Udaipur districts.

2. PREVENTION AND MITIGATION MEASURES

- 2.1. **Cutting and burning of fire lines and construction of bridle paths:**
Fire lines are broadly classified as (i) external and (ii) internal. Existing roads and natural features like watercourses can act as effective external fire lines. Internal fire lines traverse the boundaries of compartments and forest blocks.

- 2.2. Fire tracing along the roads:** Fire started from 'bidi' and cigarette stubs thrown carelessly, along road can only be prevented by burning all fire hazards on both sides of the paths and roads to a distance of 15m every year before the onset of hot weather. Inflammable material lying along the roads on both sides upto to 15 meter width should be closed burnt in the month of January.
- 2.3. Extraction of Dry Bamboos:** Dead and dry bamboos would be extracted from the forest areas wherever they exist as these are serious fire hazards.
- 2.4. Awareness:** Most fires occur due to the negligence of local people, travelers and tourists. It is, therefore, essential to educate them and make them aware of the serious consequences of forest fires and how seriously it affects our forests, environment and wild life. For this pose, training camps should be organized in the village situated on the periphery and/ or in the vicinity of the forest areas. Tourists coming to Mt. Abu, Sariska Sanctuary and Ranthambhore and Bharatpur Ghana Bird National Parks should be requested to take all the precautionary measures for prevention of forest fires. These should be depicted on signboards. Small booklets and pamphlets should be prepared and distributed to the public, Grazers and others to educate about safe methods of smoking and disposal of 'bidi' and cigarette stubs instead of throwing these while burning.
- 2.5. Development of Pasture and Animal Husbandry in the buffer areas:** The graziers would be dissuaded from the pernicious practice of setting fires to induce lush growth of grass which results in wide spread destruction of vegetation, valuable organic-humus, soil nutrients and wildlife habitat. To counter act effectively this inimical factor, following measures should be undertaken under various on-going schemes.
 - 2.5.1. Improvement or pastures through propagation of superior quality and nutritious fodder grasses and legumes in buffer areas.
 - 2.5.2. Raising of lead-fodder species in conjunctions to supplement pasture and facilitate scientific lopping and eventually promote stall feeding.
 - 2.5.3. Elimination of decrepit and unessential cattle to minimize grazing pressure on forests.
 - 2.5.4. Provision of fertilizer manure to the people at subsidized rates.
 - 2.5.5. Grant of rewards as an incentive to the communities in the vicinity of forest areas.

3. LEGAL PROVISIONS

3.1.1. Legal provisions regarding forest fire are available under Sections 26, 33 and 79 of the Rajasthan Forest Act, 1953 and Sections 30, 35(8) and 51 of Wildlife Protection Act, 1972. These provisions need to be implemented strictly to discourage any incident of deliberate and intentional fires. VFPMCs/EDCs/Villagers who do not help perform their duties, may be seriously considered for cutting down their rights over forest areas.

4. PREPAREDNESS

- 4.1. **Fire Fighting Drill:** It is essential to keep forest protection staff alert and fully prepared during fire season. Firefighting exercise involving villagers should be organized every year in the month of December, January by the respective Deputy Conservator of Forests.
- 4.2. **Firefighting unit:** Every division should ensure that firefighting unit with all equipment is ready by December month of every year since fire season may start as early as January and may last upto July/ rains. Firefighting equipment should be distributed among all ranges as per requirement and must be kept in readiness and be available twenty four hours. Equipment that must be included in the kit are: i. Fire aid kit ii. Fire beaters iii. Belcha/ Punja/ Shovel iv. Helmets with torch v. Torch vi. Axes vii. Fire preventive uniform/ shoes viii. Masks ix. 5 litre water bottle, haversack x. Water tanker with compressor xi. Plastic pipes with wire binded xii. Portable chain saw (Petrol driven) xiii. Transport vehicle (Pick up) xiv Gunny bags (sacks) xv. Ropes and xvi. Choppers
- 4.3. **Ground Patrolling:** Fire watchers should be employed during fire season for regular patrolling, particularly for fire sensitive areas to assist forest staff in detecting and preventing forest fire.
- 4.4. **People's involvement:** Village Forest Protection and Management Committees/ EDC of villagers residing along the periphery of forest would be constituted as per guidelines of GOR to assist the staff in cutting and maintenance of fire lines, construction of bridle paths, detection of fire, fire tracing, organizing firefighting squads and suppression of fire. Informers may be considered for giving reward from secret service amount after due verification for providing assistance in prevention and control of forest fires.
- 4.5. **Training:** Training for prevention and control of forest fires should be imparted to the officers and staff. Training facilities being provided by the Government of India should be availed as far as possible.

5. EXISTING MANUAL PROVISIONS OF FOREST FIRE MANAGEMENT

1. Any person desirous of burning on land within one kilometer of a Reserved or Protected Forest any wood, grass, weeds or other inflammable materials shall collect such material into heaps and burn it heap by heap in such a manner that the resulting fire does not extend to the surrounding area or endanger the Reserved or Protected Forest.
2. Any person collecting inflammable forest produce, such as grass and bamboos, on land adjoining a Reserved or Protected Forest, and any holder of a permit to collect such produce from a Reserved or Protected Forest shall stack it in an open space at such reasonable distance from the forest as the Divisional Forest Officer may by general or special orders prescribe, and shall isolate the stacks in such manner that if they take fire, the fire shall not be able to spread to the surrounding area or endanger the Reserved or Protected Forest.
3. Camping places along the boundary of, and within the limits of a Reserved or Protected Forest will be cleared and set apart by the Divisional Forest Officer for the use of travellers, a list thereof being published annually and except on such camping grounds no forest shall be lighted within or along the boundary of a Reserved or Protected Forest. All persons using these camping grounds shall light any fire they make for cooking or other purposes in such a way as not to endanger the Reserved or Protected Forest or any buildings, sheds or other property on the camping grounds and before leaving they shall collect in the centre of the camping ground all inflammable material which is to be left behind, and shall carefully extinguish all fires.
4. The carrying of burning wood, firebrands or torches along the boundary of any Reserved or Protected Forest is prohibited between the 1st February and 30th June or such earlier or later date as may be notified by the Divisional Forest Officer under Section 26(c) with the previous approval of the Regional Chief Conservator of Forests. Smoking is similarly prohibited between the 1st February and 30th June within a Reserved or Protected Forest, except at an authorised camping ground.
5. The kindling, keeping and carriage of fire along fixed routes and at camping places is permitted provided that nothing in this rule shall imply permission to set fire to any forest, or to kindle, keep or carry any fire or leave burning any fire so kindled in such a manner as to endanger any forest.

Divisional Forest Officer in charge of Divisions are empowered to notify seasons during which the kindling etc. of fire in Government forest is not prohibited.

6. Rules for Fire Protection Operations

7.1. The forest areas of each Division will be divided into three classes for the purposes of protection against fire according to the prescriptions of sanctioned working plans or failing such prescriptions by executive orders of the Regional Chief Conservator of Forests..

7.2. The following are the Forests to be -

7.2.1 Completely Protected

7.2.1.1. Regeneration coupes;

7.2.1.2. Young regenerated woods including felled coupes whilst closed to grazing.

7.2.1.3. Plantations and Nurseries.

7.2.1.4. Such other areas as the Regional Chief Conservator of Forests may for special reasons direct (e.g. grass birs and areas under rotational grazing).

7.2.1.5. All areas will be isolated by means of fire lines and cut guide lines and will be patrolled by watchers or other forest staff.

7.2.1.6. Any fire occurring in them must be reported, whatever the area burnt or the date of occurrence may be. Every case of fire will also be properly investigated.

7.2.1.7. National Parks and Wildlife Sanctuaries

7.2.2 Generally Protected

7.2.1.8. All forests under systematic working and

7.2.1.9. Such other areas as the Regional Chief Conservator of Forests may for special reasons direct.

7.2.1.10. All areas in this class will generally have natural boundaries such as roads, nalas or otherwise will be isolated from the surrounding country by means of fire lines and divided into convenient blocks by interior fire lines. No fire lines will be cut, but all existing fire lines, roads, paths, suitable ridges, grass lands etc., will be burnt in successive stages as the grass dries sufficiently to be combustible, and the fire allowed to burn itself out.

7.2.1.11. As a supplementary measure the early burning of portions

of areas of this class may be sanctioned by the Regional Chief Conservator of Forests. By early burning is meant a deliberate attempt to pass a slow fire early in the year through the whole area under such treatment.

7.2.1.12. The concerned authorities of other departments may be apprised in advance and their cooperation may be sought in dealing with any eventuality.

7.2.1.13. Special steps should be taken to prevent fires in timber depots. Fire extinguishers and water should be kept ready for use in case of any eventuality. JFM Committees & Protection Committees should be actively involved in Prevention and control of forest fires. Other people living in and around the forest areas and getting benefits from the forests should also be actively involved.

7.2.1.14. The communities and government staff should be regularly trained for prevention and control of forest fires.

7.2.1.15. Efforts should be made to create public awareness against the ill effects of forest fires. A fire week could be celebrated to create mass awareness.

7.3. Fire Lines

7.3.1 Fire lines are of two kinds, exterior and interior. The responsibility for their upkeep rests with the Deputy Conservator of Forests. The following instructions should be carefully attended to by them in the performance of this duty:

7.3.1.1 It is an established principle in the construction of exterior fire lines that as far as practicable they should be within the limits of Government forest and that they should follow the boundary thereof. Occasions may sometimes arise when in order to secure efficiency, it is necessary to deviate from sinuous or difficult boundaries in favor of straight lines running through the government forests.

7.3.1.2 Interior fire lines are constructed within Government forest and are intended to restrict within limits fires, which have broken out in protected areas and cannot be controlled except by counter firing. These fire lines should follow the course of roads open to the public and the beds of rivers and streams which, in addition to other advantage

themselves constitute natural efficient interior fire lines. Interior fire lines should, as far as possible, not be constructed along ridges, as there the effect of wind is greatest and water scarcest.

7.3.1.3 Fire lines should be so selected and laid out on the ground that it is not only practicable, but easy to traverse them with facility. Steep gradients and rough ground should be avoided as far as possible. Where practicable, fire lines should follow natural clearings such as open glades, the edge of cultivated plains, or the beds of wide ravines and streams. They should be located as near water as possible, and the localities, where wells exist or should be made and all spots where water can be procured, should be marked on the fire maps.

7.3.1.4 In completely fire-protected forests the following measures are prescribed:-

7.3.1.4.1 The first consideration in the isolation of the forest from the surrounding country. This will be affected by clearing the exterior fire lines of all inflammable material to a width determined by local circumstances, ordinarily not less than 40 or more than 100 feet not later than the month of December where necessary two guide lines will be cut, one on either side of the area decided on for the fire line. The width of guidelines will depend on the height of the grass through which they run and they must be carefully cleared. This work must be completed by the end of December.

7.3.1.4.2 Exterior lines include coupe lines - which form the boundary between the areas. In adjoining areas, no fire lines will be cleared, but a guideline will be cut and burnt and the fire allowed to burn itself out, under control and supervision of a Forester, a Head Guard or at least the Beat Guard.

7.3.1.4.3 Interior fire lines will be similarly treated, but will usually be narrower than exterior lines.

7.3.1.4.4 As the season advances the grass in the center of the fire lines will dry and should either be burnt off

standing or cut close to the ground over the whole width of the line. If the latter course is followed, the cut grass should be spread over the fire lines between the guide lines and burnt as soon as dry.

7.3.1.4.5 Dry leaves and other dry material on fire lines must be collected from time to time and deposited along the edge of the fire lines; but the burning of such material on the lines after the hot weather has commenced, is strictly prohibited.

7.3.1.4.6 Except with the express order of the Divisional Forest Officer and in the presence of the Range Officer or other subordinate authorized by the Divisional Forest Officer, no fire lines shall be burnt after March 31st.

7.3.1.5 In generally protected areas no firelines are cut. The fire is allowed to burn under control so as to interpose a wide burnt strip between the area and the surrounding country. The grass must be burnt as soon as it is sufficiently dry, and the operation must be carried out by stages. To control the operation, the Deputy Conservator of Forests will receive, from the 1st December or such earlier date as he may fix, a fortnightly report from the Range Officer concerned showing the progress made in burning. The date by which burning must be completed will be fixed by the Regional Chief Conservator of Forests and a report will be made to him of the progress made and of the reasons for delays, if any, by the Divisional Forest Officer a fortnight before the date so fixed. After the date fixed operations must cease except with the special sanction of the Regional Chief Conservator of Forests.

7.3.1.6 Existing fire lines will be utilised as far as possible. New lines will not be made without the sanction of the Regional Chief Conservator of Forests.

7.4. Fire Watchers or Fire Guards

7.3.2 It is the duty of fire Watchers or Fire Guards constantly to patrol the fire lines in their beats, to keep them entirely free from inflammable material, to prevent the carrying or making of fire within or in the vicinity of the protected area, to give immediate notice of the

occurrence of a fire to the beat officer, to collect assistance and aid in extinguishing any fire that may occur.

- 7.3.3 Fire Watchers must always be on their beats. Divisional Forest Officer will see that proper Machans for the men to sleep on by night and fair accommodation below for cooking by day are provided at suitable places. Fire stations must be situated on elevated spots, so that the watchers may command a good view of the forest they are watching.

8 Fires

- 8.3 Any Forest Ranger, Forester, Head Guard or Forest Guard who may see smoke rising anywhere in or near the forest shall at once collect such aid as is immediately available and proceed in person to the spot. He must not sit quiet and send someone else to enquire or report. The forest official who arrives at a spot where a fire is burning shall at once proceed to extinguish it. If the fire is outside his own beat or range, he will continue there till relieved by the local men, when he will return to his own beat or range, unless the fire is so strong as to demand all possible help.
- 8.4 The greatest care must be taken that fires are thoroughly extinguished and all smoldering materials absolutely quenched. Filling earth over such materials will be found very effective. No official shall leave the burnt locality till the Senior Forest Officer present has satisfied himself that no smoldering material remains.
- 8.5 All men, except right-holders and graziers assisting in extinguishing fires in Government forest (including forest villagers) shall be paid according to the amount of assistance rendered at rates fixed by the Deputy Conservator of Forests in consultation with the Collector or Tehsildar.

9 Responsibility

- 9.3 The Range Officer is held personally responsible for the efficiency of fire protection in his range.
- 9.4 Where protected forest of two ranges adjoin, the responsibility for efficient protection and clearing of the common fire line will rest with one of the Range Officers to be selected by the Divisional Forest Officer, the Regional Chief Conservator of Forests or two Regional Chief Conservator of Forests in consultation according to whether the two ranges belong to the same division, two different divisions of the same Circle or two different circles. These orders will be in writing and kept in the file of standing orders.

- 9.5 The Divisional Forest Officer is personally responsible for carrying out efficiently the fire protection measure ordered in his division. He must satisfy himself that the exterior fire lines have been properly cleared and thoroughly burnt before danger from external fire arises, and that at the same time all interior fire lines are in good order. He must, by continual inspection, assure himself that the protective staff is efficient, and he must continue to attend to this work until the arrangements for the efficient protection of the forests from fire are completed. He must, during his tour, satisfy himself by constant enquiries that no fires in protected areas have gone unreported, and that the areas of reported fires have been accurately estimated. These checks require extensive and through personal inspection by him.
- 9.6 Rajasthan Forest Act 1953 provides that beneficiaries of forests are bound to help forest/police officers in case of fire under section 79.

10 Fire Reports

- 10.3 The Range Officer shall report the outbreak of a fire to the Divisional Officer at once, using special dispatch if the fire extends over a large area. The Range Officer must provide for rapid communication between himself and his staff in fire-protected areas so that no delay may occur in his receiving report of the outbreak of a fire and in transmission by him of such intimation to Divisional Officer. The inspection of the area burnt and submission of a full final report with a sketch map by the Range Officer shall not without valid reason be delayed for more than a fortnight after the outbreak.
- 10.4 The Divisional Officer will submit monthly (in the prescribed form to the Regional Chief Conservator of Forests a summary of fires showing the serial number, date of occurrence, cause, area burnt, extent of damage, and measures taken to bring it under control.
- 10.5 Maps showing the results of fire-protection shall be prepared and maintained.
- 10.6 Records of fires are to be maintained on a separate 1: 50000 map, to be known as fire maps. Two copies of these maps should be maintained in all divisions one cut and folding, to be taken in camp by the Deputy Conservator of Forests and the other to be kept at the head quarters as a permanent record.

10.7 The following system of shading will be employed in all the divisions -

Block Shading	Red Shading	Type of Shading
Fires occurring in		
1991	1996	
1992	1997	
1993	1998	
1994	1999	
1995	2000	

10.8 These fire maps shall be made for one decade at a time, and at the beginning of a new decade a fresh set of maps shall be prepared employing the same system of shading.

10.9 Fires of 20 ha or more shall be entered on these special fire maps.

10.10 Fire shall be entered annually, and the maps kept up to date. Regional Chief Conservator of Forests shall inspect the maps during their tours and at office inspections.

10.11 Fire maps shall not be kept in compartment histories, but a brief reference to fires that occur shall be made in the history of the compartment concerned.

10.12 Areas deliberately burnt for silvicultural reasons, e.g., to destroy felling debris or to stimulate reproduction or as a measure of protection from hot weather fires will not be reported unless they spread into protected areas. Deliberate burning is only permissible if prescribed by a Working Plan or sanctioned by the Regional Chief Conservator of Forests. A brief reference of such burnings shall be made in the history of the compartment concerned.

11 Fire maps

11.3 In order to determine the vulnerable areas from the point of view of fire protection in each division, the Deputy Conservator of Forests will maintain fire maps for the whole of his division in 1:50000 scale. On this map the Deputy Conservator of Forests would plot in each year as accurately as his observations allow, the area burnt, in the manner indicated below:-

11.3.1 The first year's fires will be marked in horizontal lines, the second year's fire whether occurring in the same or not will be marked in

vertical lines, the third year's fires will be marked in right diagonal lines, the 4th year's fire in left diagonal lines and 5th year's fires in dots, if these fires occur in the same area more than once, these marking will overlap those previously made. That is to say, if there be a fire in the 2nd year the vertical lines will superimpose the horizontal lines. If again a fire occurs in the 3rd year the marking will be super-imposed with right diagonal lines, and so on. Every 6th year separate map will be used and the same scheme of marking will be followed.

- 11.3.2 The Deputy Conservators of Forests should submit these fire maps at the time of Office Inspection by the Regional Chief Conservators of Forests. The Regional Chief Conservator of Forests will enter suitable remarks in the Inspection Register to show whether these fire maps are being maintained properly or not. If these maps are maintained properly, it would be easy for the Divisional Forest Officer to know at a glance which parts of his forests are most vulnerable from the point of view of forest fires and he can easily make arrangements for their protection in time and in advance say for departmental burning.

Proforma
Report on Fire

1. Date of Occurrence _____
2. Date and time of receipt of information
of the occurrence at the Range Office _____
3. Approximate areas in acres burnt _____
4. Cause of fire (accidental, incendiary
or crossing over from the adjoining area.) _____
5. Steps taken to extinguish _____
6. Time taken to bring it under control _____
7. Assessment of damage caused _____