



Regional Eastern Europe Fire Monitoring
Center (REEFMC)



The Global Fire Monitoring Center (GFMC)

Fire Protection of Forests in Ukraine during and after the Armed Conflict Recommendations for Wildfire Safety, Prevention and Control

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Ammunition-contaminated forests are widespread in the world in the regions of former military conflicts: Azerbaijan, Armenia, Bosnia and Herzegovina, Germany, Israel, Palestine, Northern Macedonia, Russia, Georgia, Vietnam, and other countries. In Ukraine, the territories affected by historic armed conflicts are primarily in areas of nature conservation / environmental protection. Even decades after the end of the conflict, in most cases forests remain mined, fenced, restricted to civilians, and remain without forest cover.

The principles of fire management in forests and open landscapes historically contaminated with unexploded ordnance (UXO) have been developed and formulated by the Global Fire Monitoring Center (GFMC)¹. Relevant guidance adapted to German conditions and legislation can also be used in Ukraine for general information.^{2,3}

During the currently ongoing war Ukraine's forests are affected by hostilities by the impact of missiles, artillery shells, aerial bombs, land mines. These forests are extremely dangerous to the Security, health and lives of civilians and forest guards. **Forestry and silvicultural activities in such places shall not be carried out before UXO clearing and demining.**

The greatest threats to forest protection personnel arise in the event of fires in pine forests, in which fighting took place. Fire may trigger explosions of ammunition that did not detonate during hostilities. Land mines in these forests pose a high risk of injury or fatal damage to forest protection personnel.

During hostilities in the territories of forestry enterprises, the forest guard must leave the dangerous area and unless there are other special orders of the head of the enterprise, e.g., requests for supporting the Armed Forces and local governments. Any actions to prevent and extinguish fires are carried out only after the liberation of the territory. In case of threat of transition of forest fires to settlements, actions on protection of the settlement are taken jointly with representatives of the settlement.

In order to minimize the risks to forest protection, it is advisable to take the following safety measures when preventing and extinguishing fires in forests where hostilities have taken place.

¹ https://gfmc.online/globalnetworks/SEEurope/SEEurope_1_radio.html

² <https://gfmc.online/wp-content/uploads/GFMC-Publication-RX-Burning-UXO-Terrain-2016.pdf>

³ <https://gfmc.online/globalnetworks/seeurope/OSCE-GFMC-Report-Fire-Management-Contaminated-Terrain-2014-RUS.pdf>

1. Lists of forest quarters and areas, where unexploded ordnance and land mines may be located, must be developed and approved by order of the director of the forestry enterprise in order to introduce a special procedure for planning and conducting measures of forest management and forest fire protection. These areas of the forest fund should be allocated in a special way on the plans of forest plantations.
2. The special procedure for work in such quarters must be agreed with the territorial body of the State Emergency Service of Ukraine (SESU) and representatives of the Armed Forces. A separate section will provide a plan for demining.
3. Forest guards, who are working in forests with UXO, must be equipped with the following personal protective equipment: army (military) helmet, bulletproof vest, individual radio, individual first aid kit and other necessary equipment as used by the Armed Forces of Ukraine.
4. In forests with unexploded ordnance, it is prohibited:
 - a. to go to investigate the fire deep into the forest on which the fire is moving.
 - b. to extinguish a forest fire on the line of fire.
 - c. to deploy fire equipment (ZIL-131, GAZ-66 or other heavy fire trucks, light fire modules, other forest protection vehicles, tractors, motorcycles) and lay fire hoses inside the contaminated forest.
5. The main purpose of protection of forests with unexploded ordnance from fires is to ensure the personal safety of the local population, fire safety of settlements located within one kilometre of such forests, and the safety of forestry personnel.
6. **Fire prevention.** Fire prevention is the main strategy for fire protection of forests with unexploded ordnance. All fire prevention measures must be planned for medium- to long-term (the fire-hazardous period of the current year or for several years) in order to maintain their effectiveness until demining.
7. The danger of the occurrence and development of intense fires in forests with unexploded ordnance exists only in plantations with a share of Scots pine of 40% or more.
8. Such plantations are separated from other areas of the forest fund or other areas by three mineralized strips, which are located at a distance of 3-5 meters from each other. If possible, it is advisable to lay mineralized strips using BAT-2 or other military engineering equipment, tanks in which the operator is physically protected. In case of constructing mineralized strips by a tractor, it is desirable to protect the lower part of the tractor and the driver's seat with steel plate according to the requirements recommended by the representatives of the Armed Forces.
9. Mineral strips and areas between them should be free or free of unexploded ordnance. If possible, the areas contaminated with ammunition are separated from other areas by creating deciduous edges 10-15 rows wide by drought-resistant local species.
10. When detecting fires in areas with ammunition and in areas without ammunition, priority in response is given to the first category.

11. **Extinguishing fires.** The main strategy for extinguishing fires in forests with ammunition is to monitor their development from a safe place, the safety of civilians and prevent fires from entering unpolluted areas.
12. To monitor the development of fires in contaminated forests, forest guards must be equipped with personal protective equipment and be in a safe place at a distance of at least 300 m, e.g. behind the car or any protective object to avoid impacts in case of explosions and the passage of fragments like bomb splinters. Fire development should be monitored remotely, e.g. by using UAVs.
13. In the event of a fire in an area not contaminated with ammunition, the forest guard, together with the involved SESU units and volunteer fire brigades, localizes and extinguishes the usual methods.
14. After the area with ammunition burns out, guards have to be posted around the burned area, especially at the leeward part, to monitor re-ignition and prevent the start of fires outside of the burned area caused by wind-driven flying embers.
15. In areas with ammunition passed by fire silvicultural activities shall not be carried out before the whole area has been cleared by UXO and land mines.
16. Restoration of forest cover by natural regeneration will be prioritized. However, UXO and land mine clearance should be carried out immediately after the armed conflict in order to safeguard forests and people during the coming decades of forest recovery and forest utilization.