To the President of Ukraine
To the Prime Minister of Ukraine
Community leaders and local authorities
Businesses and organizations,
citizens, land and forest users

APPEAL
TO THE PRESIDENT OF UKRAINE OF THE REGIONAL EASTERN EUROPEAN FIRE MONITORING CENTER (REEFMC) ON FOREST FIRE EMERGENCY SITUATION IN UKRAINE AND RECOMMENDATIONS ON URGENT SHORT-TERM MEASURES ON FIRE MANAGEMENT DURING A PERIOD OF EXTREME FIRE DANGER

12-04-2020
Prepared by: Zibtsev SV
sergiy.zibtsev@nubip.edu.ua

This appeal was caused by the formation in Ukraine of a qualitatively new type of emergency fire danger in 2020 , which led to the largest areas of fire in the history of Ukraine in the exclusion zone and around (more than 30,000 hectares), radiation contamination of large territories outside the exclusion zone, the destruction of individual houses by fire. and entire settlements, mobilization of an extraordinary amount of interagency firefighting and resources, and the use of emergency funds for fire fighting operations.

The purpose of the appeal is to attract the attention of all verticals of the executive power, local self-government bodies, scientific and educational professional institutions, organizations responsible for the prevention and extinguishing of fires, forest and land users, land owners to the new conditions of fire danger and the need to create and support the state the levels of a qualitatively new interagency pro-active integrated forest protection system, natural and cultural landscapes from the example of developed countries, which would take into account the interests and capabilities of all Participants were coordinated at the local and central level.

Organization of the state system of protection of forests, cultural and natural landscapes from fires in Ukraine and the world .

Developed Countries (Australia, Greece, Spain, Italy, Canada, South Africa, Portugal, USA, Turkey and others) where major forest fires occur regularly, resulting in extensive material damage, destruction of human settlements and strategy fighting natural fires amid climate change. Such a strategy includes multi-year plans to create and financially support the fire departments of various agencies - large forest and land users, create national interagency coordination teams for financial and resource support for fire fighting operations (eg *National Interagency Fire Center , Boise*), fire prevention measures (sell-outs) , working with local government, media, local people, such as *FireSmart , Canada* , *Missoula Fire Lab* , preparing interagency systems to combat ozhezhamy (*ICS*), rules and guidelines firefighting (*IRPG*), training and certification of forest fire extinguishing and managers at various levels, the strategic reserves of equipment and materials, land and air forces and resources, and more.

Periodic major fires in Ukraine (over 10,000 hectares) during 2007-2020, civilian casualties, destruction of settlements indicate that Ukraine no longer belongs to countries with low fire risk and low area and intensity fires, and became a group of countries with periodic natural disasters. This requires an analysis of the effectiveness of the existing fire protection system and its refinement to meet new risks and challenges.

Since 2013, the Regional East European Fire Monitoring Center (REEFMC), aware of the formation of new dangerous fire regimes in Ukraine, together with its international partners, began work in this area through conducting forest research , publications of popular and scientific articles , interviews with Ukrainian media, interviews with Ukrainian media. *EUROFIRE* and *Incident Command System* , the organization of international conferences and round tables (2007-2019), including appeals to the Government (2007 , 2016), developing the concept of interagency protection in A forest fire exclusion zone of *the National interagency coordinating tional meetings on preventing and fighting fires (2016-2018), staff of international and interagency exercises to extinguish large fires , developing a pocket guide forest fire , on the Levu training on forest fire and Recommendations " Protecting Human points, farms and other fire-fighting facilities in the countryside ", an international fire management glossary , guides for international firefighting forces and other activities.*

The following is a brief analysis of the current state of state support and implementation of natural fire prevention and extinguishing in Ukraine, and on this basis provides generic recommendations for urgent fire control steps for various levels of executive and local government and businesses.

Firefighting and aviation protection of forests. In recent years, as a result of irresponsible forest policy, the state system of forest fires protection in Ukraine has been destroyed. The following key forestry establishments have been eliminated or are under liquidation: UkrDiprolis SE , which developed firefighting projects, the Ukrainian State Forest Aviation Protection Base, which provided prompt information to forestry enterprises about the level of fire hazards, weather damage a single new and more up-to-date approach for forestry enterprises is proposed . Training of aviation observers and forest paratroopers has been stopped. Ukrainian methodology and standards for conducting fire-fighting equipment of forestry enterprises have not been approved.

Meteorological support. Due to the lack of interagency coordination, the Ukrainian Hydrometeorological Center without approval of the CEV responsible for implementing forest policy and scientific institutions of the forest profile replaced the "Fire Hazard Scale for Weather Conditions", which was published on the Hydrological Center web site, 2006), had 5 classes - on a new scale of meteorological warnings (https://meteo.gov.ua/en/33345/storms). This scale is as of April 7, 2020 with a complex fire hazard index of more than 5000 (V class fire danger of weather - extreme fire danger) and thousands of fires all over Ukraine, including a fire area of 7811 hectares in the zone of alienation (3-5 April 2020) indicates that "Weather conditions do not pose a threat". Thus, the entire forestry sector was left without the meteorological support of the state, which disoriented the forestry services of the enterprises and did not allow to ensure the level of readiness that corresponded to the current danger.

Public funding. All state funding for forest protection in Ukraine has been discontinued since 2016, resulting in the loss, first of all, in the south-eastern regions, of qualified personnel in forestry: firefighters, firefighters and other personnel fire equipment and neglect of fire infrastructure. Now, in the midst of a firefighting period, some funding has been allocated, but this is not enough to make the system work.

Reporting of forest and natural fires at national level. The system of reliable national accounting of the number and area of natural fires in Ukraine does not function, a single CEB that collects all statistics on landscape fires is not assigned, responsibility for false information is not provided (Zibtsev et al ., 2019[1]). For example, a fire in the forest Lubyanka Chornobyl her band 26-30 April 2015 9.8 thousand. Ha DSNS statistics and national statistics reflected a fire with an area of 600 hectares. The absence or distortion of fire statistics these years makes it impossible to assess the magnitude of the problem and to make appropriate national forest policy and management decisions

at government level. Inaccurate internal statistics lead to the distortion of Ukraine's flammability indicators in databases of international organizations, where the situation does not seem critical and, therefore, Ukraine does not require adequate EU technical assistance. For example, in 2015, only two fires in the Exclusion Zone covered 14.8 thousand hectares (Evangelio et al ., 2016 [2]), while the EU report "Forest fires in Europe, the Middle East and North Africa" in the section "Ukraine" presents the area of forest fires in 2015 up to 3 thousand hectares (European Forest Fire Information System , 2018 [3]).

Organization of forest protection against fires. State forest managers are personally responsible for the number and area of fires, which is incorrect because the number of fires depends on the number of sources of fire and is determined by the intensity of the forest environment and, therefore, cannot be controlled by foresters and, while the area of fire is, indeed, determined by the level of fire. readiness of fire-fighting forces and means. The lack of necessary financial, regulatory and technical support and the requirement for a low number of fires often leads to an underestimation of the number and area of fires in the reporting (this is noticeable since fire statistics of enterprises do not correspond to the data of Earth remote sensing (Zibtsev et al., 2019[4])) and reducing losses from fire. However, to date, every fire is recorded by satellites, and numerous fire card products are free and accessible to all users (FIRMS, WorldView , OroraTech , GOFC-GOLD, EFFIS, and others). The State Fire Agency of Ukraine for Forests of Subsidiaries has the best fire statistics , but it is not official and open. Accordingly, relatively integrated and controlled system of protection of forests from fires, there is only 72% of forests Ukraine subordinated s Derzhlisahenstvu and other forests in the level usually poor and uncontrolled, with isolated exceptions.

Agroforestry and forest enterprises of other agencies (28% of Ukrainian forests) are out of the control and state control, in terms of fire statistics, readiness for the fire period and measures to prevent and extinguish fires. Institutions of the Nature Reserve Fund of Ukraine do not have targeted funding for the protection of forests from fires, do not have adapted to the objectives of biodiversity management of the instructions for fire prevention and extinguishing measures and, in most, do not have sufficient firefighting resources and resources. Numerous large-scale wildfires in Ukraine (more than 200 ha, including a fire extinguished personally by the third President of Ukraine up to 9000 ha), are not investigated properly, the causes are not established and are not publicly disclosed to all interested parties and enterprises, guilty citizens or officials of large fires are not held liable and.

State of scientific substantiation of forest protection against fires. In addition to the lack of adequate state control and management of forest protection against fires, since the late 1980s Ukraine has had serious deficiencies in the national system of forest protection against fire. After 1 991, the relevant Soviet normative documents were replaced by Ukrainian ones, but without any scientific justification due to the absence of a scientific institution / laboratory that would carry out systematic forest pyrological research or even a one -off research topic (3-5 years), which would allow to substantiate the existing regulatory framework for the protection of forests from fires. Accordingly, there is no fire zoning in Ukraine (such as in Poland or Belarus), and the Natural Fire Hazard Scale is not tied to real combustibility, stocks and maturity of combustible materials. The scale of fire danger in the weather is not tied to combustibility, is out of date and out of date. In the exclusion zone, it lowers the real fire risk by at least one class (Gilitukha , Zibtsev, Borsuk, 2011), which results in low staff readiness. There are no national data on the stocks and humidity of combustible materials and their fractional structure, there are no maps and models of combustible materials and models for predicting fires, predicting the risk of fires. Regulatory levels of forest protection against fires have not been developed, which should be based on the flammability and value of forests, as well as their resistance to fires. Relatively recently begun environmental studies of forest fires group led by s.n.s . Crow VP (UkrNILILA) and NUBiP Forest Pyrology Laboratory, which is a necessary component for planning

forest management activities in forests of various kinds, assessing the impact of fires on biodiversity, the impact of anthropogenic factors on forest burns and, respectively, determining the level of forest cover and deforestation. All the above studies and other information (road maps , reservoirs, their parameters, etc.) are the basis for determining the location of fire barriers and their types, the content of fire prevention, preparedness and rapid response, determining the strategy and tactics of extinguishing.

Legislative regulation. Current lisopozhezhna policy in Ukraine and is based on the requirement of law that land-each / forest user is responsible for preventing and extinguishing fires and in case of acquisition of fire emergency signs, mostly by area, type of fire and category of land management hectare hay units of the State Emergency Service of Ukraine take over. In other words, until the moment of an emergency. Fire is a problem for the organization - the land user and / or the entity in whose field the enterprise is located . There is no single CEB that would control the policy and legislation in the field of plant fires prevention and extinguishing in Ukraine. Forest users and PFP institutions are guided by fire regulations, which are approved by the orders of the State Forest Agency (https://nubip.edu.ua/node/9083/5).

All plant fires outside forests - on fallow lands, reserve lands, depleted and degraded, eroded lands, agricultural lands, floodplains, pastures , etc., which are tens and hundreds of times greater than forest fires - are extinguished by the SES. In this case, police often do not investigate cases of burning and do not bring the case to punish violators. The SESP is not obliged to carry out preventive fire fighting in these categories of land, to organize detection and early response to fire. Land users or tenants often do not. Without a link to prevention and prevention, fire prevention measures, the SESS firefighting activity is often a "Sisyphean work", since next year fires occur again. The best statistics of natural fires outside the forest fund are available to the SES, but it is limited only to the cases of fires extinguished by this unit , reflects a portion of the total number of fires, and is not reflected in the statistics of the State Statistics Service of Ukraine.

Land reform and fires. Unprepared land reform left alone with the new owners of the market, without government support, banks and not to radnytstva on technology that makes farmers and tenants are widely used as flame agrotechnical measure. Under pressure from non-governmental green organizations and environmentalists, the burning of vegetation in fields and gardens prohibited legislative and administrative and criminal penalties, but in return the state did not offer landowners any financial support for additional plowing or other agrotechnical measures for agricultural land preparation. , no other solutions, such as learning safe pile technology, as is the case in other countries. This led to the opposite: if landowners had previously burned plant residues openly and controlled their fallen lands in order to let the fire out of the site, then after the introduction of the ban and fines, they continued to do so but not openly and without control, leading to the exit. fire outside the area of burning, the development of grassy, peat fires, which in high winds crossed the forest areas and caused forest fires, including, and especially large size. As a result, the area of fires on agricultural land and other non-forested lands increased significantly, but the CEB responsible for these lands did not pay attention or was more aware of it.

Ukraine has long been recognized by NASA and NASA as an important source of black carbon emissions from grass piles. In particular, agricultural fires in 2006 in Ukraine, Belarus and the European part of Russia caused the transfer of large quantities of black carbon with southeast winds to the Arctic, where these aerosols deposited on glaciers, which led to their albedo changing and causing their albedo to change melting (Stohl et al ., 2007). In order to determine the causes of fires in agricultural lands in Ukraine and the development of measures to reduce them implemented the project of the International Cryospheric climate with Brussels, (ICCI, http: // ukr aineopenburning.org/Ukranian).

Climate change. Under different scenarios, climate change will lead to significant reductions in forest areas of major forest-forming species in the central, eastern and northern regions (Schwydenko et al., 2016), including due to large forest fires. With all the shortcomings and problems, the situation with forest and natural fires was relatively stable and was limited by periodic especially large fires (2-3 to 10 thousand hectares), which were designated by the responsible persons for the press and the population as an inevitable natural disaster rather than miscalculation. in the organization of forest protection against fires (exclusion zone 1992 (up to 17 thousand hectares); Kremenna , Lugansk region; Izium, Kharkiv region; Kamen- Kashirskoye LH, Volyn region ; Oleshkovsky sands, Kherson region (numerous, including - 9 thousand hectares, 2007); I Tyn natural reserve, Crimea (1000 ha, 2007); Poleski Nature Reserve (2009 and 2018 of 900 and 500 hectares) Sarnenskiy LH, Rivne natural for povidnyk) other. Since 2010, climate change has increasingly exacerbated the forest-fire problem, but adaptation of the forest protection system to new conditions has not taken place, and so-called reactive management has been applied instead - delayed one-off reaction and mobilization for another major fire without further systemic changes. the next fire.

Positive experience of Ukraine in 2010 The first alarming bell was the dry summer and heat wave of 20.07.2010 - 15.08.2010 which led to numerous catastrophic forest fires in the European part of the Russian Federation that caused the death of people by burning, burning. tens of settlements, smokiness of large territories. In that year, Ukraine, under similar conditions of extreme drought and fire risk of the weather, demonstrated that even in such difficult conditions of heat waves, catastrophic scenarios could be prevented at the expense of the right decisions at the highest levels of power, timely mobilization, close inter- regional cooperation. and a high level of readiness for firefighters and facilities. As a result, Ukraine's Flammability Index for the critical year 2010 was below the long-term average of 1041 fires. How did it work?

After it became clear that the fires in the European parts and Russia were threatening and uncontrolled, a number of timely and effective decisions were made by the Cabinet of Ministers of Ukraine (№0401 / 0 / 2-10 of 30.07.10), the NSDC and the President of Ukraine (No. 801/2010) on emergency measures to enhance the protection of forests against fires. These decisions provided for personal responsibility of heads of regional state administrations for organization of prevention of catastrophic fires, daily report of the National Space Agency of Ukraine on the area of fires and Ukrhydromet on the level of fire danger of weather, involvement of personnel of the Ministry of Emergency Situations, Ministry of Internal Affairs, Ministry of State Committee Ministry of environmental protection, local executive bodies to pA trulyuvannya forest (1900 interagency patrols day involving foresters, rescue and police) and checks the state of preparedness for rapid response lisopozhezhnyh and other relevant services. Entry into the forests was temporarily banned by local authorities across Ukraine. According to the results of the inspections, there were up to 500 administrative protocols per day for violators of fire safety rules. Two patrols of Mi-2 helicopters (Central Air Base) were carried out daily, and AN-32P and Mi-8 helicopters were in full combat readiness for aviation extinguishing. The State Automobile Inspectorate banned the parking of private cars on roads near forests and fields. The whole press was involved in explaining the current situation. And it worked. Such a scheme can be used even now during periods of extreme fire danger.

Current state of implementation of new technologies in forest protection in Ukraine. In the absence of budgetary financing, forestry enterprises try to implement modern technologies in the daily practice of fire prevention and suppression as far as economic opportunities and skills are concerned. First of all, it concerns the installation of CCTV cameras for detecting fires and forming mobile patrol teams and early responders on light fire modules or even motorcycles for aggressive extinguishing of fires in the early stages. Preferably, this applies to economically developed forestry enterprises of the State Forestry Agency . However, the lack of clear and up-to-date official guidance from the State Forest Agency on action, responsibility and organization in the detection-response-

extinguishing triad, as well as funding, makes existing attempts to implement new technologies incomplete and ineffective in the event of extreme fire and extreme weather hazards.

International cooperation. Since 2005, Ukraine has been actively cooperating with leading experts and agencies of the world in the field of forest fire protection, first of all, with the International Forest Service programs of the USA, Yale University, the USA, the Global Fire Monitoring Center (GFMC), Germany, the Council of Europe, OSCE, UNEP, GEF and other organizations to share best practices and share scientific research. Within the framework of domestic cooperation in Ukraine, joint trainings were held for forestry firefighters and firefighters, police on safe response and extinguishing large fires, and other activities. With the assistance of the Council of Europe, the Center for Fire Monitoring and the Society of Foresters of Ukraine developed and adopted the Law of Ukraine on Increasing Responsibility for Causing Vegetable Fires, recently adopted by the Verkhovna Rada of Ukraine and signed by the President of Ukraine. Therefore, the international community is ready to provide Ukraine with all the necessary technical assistance to create a new interagency fire prevention and firefighting system and training, first of all, forest firefighters and firefighters.

Summary: Major Disadvantages of the State System for the Protection of the Landscape from Natural Fires and Causes of Catastrophic Fires in 2020

None of the agencies alone is capable of coping with the fires that took place in April 2020, at the same time no decisions were taken at the level of the Cabinet of Ministers and the NSDC to mobilize the responsible agencies, as in July 2010. Climate change, which has changed the firestorm in Ukraine, and the pandemic have significantly complicated the situation.

The departmental principle of protection of landscapes from fires causes numerous weak links in the landscape , which are outside the fire protection system (floodplains, landslides, reserve lands, agricultural lands, PZF lands, etc.), from which a fire, which is not possible in emergency situations, usually begins. to control after the occurrence of catastrophic scales by fire departments of the Forest Service or SES.

There is no effective national interdepartmental fire extinguishing system that involves rapid formation of interdepartmental forces, the availability of qualified and competent firefighters with the right to dispose of extinguishing resources, no reserves of equipment and materials that can be quickly mobilized for extinguishing, no occupations forest firefighters with appropriate equipment and skills, and a mechanism for interagency compensation in the event of joint firefighting.

Only about 13% of Ukraine's landscapes have a specific forest protection system (prevention-detection-response-extinguishing-restoration). The rest of the landscapes, for which SESA is primarily responsible , only have a fire fighting link, which is a highly inefficient approach to controlling fires from the point of view of taxpayers. Even with these 13%, forests in the southern and south-eastern regions are also not fully protected by fire due to lack of funding .

There is no single modern method of conducting joint headquarters and field exercises of the forest fire forces and facilities together with the SES units before the beginning of the fire-fighting period with the development of the real-life most difficult scenarios of fire development on the renewal of previous catastrophic fires (more than 1-3 thousand hectares), operations. There is no open and public system of analysis and correction of errors after major fires (1992, 1998, 2003, 2007, 2015, 2017, 2018, 2019), and amendments to the normative documents in order to prevent them in the future.

In addition to climatic conditions and lack of interagency cooperation, major fires in 2020 have also developed due to unsatisfactory material support, unsatisfactory preventive measures, such as lack of involvement of local communities, lack of meteorological support for the forest protection system, lack of control and neglect. of forest fire station), low readily untimely arrival

of the fire (no national or regional normaty you arrival time to fire), The use of inappropriate strategies and tactics quenching and due to other reasons.

There is no scientific analysis of fire regimes of landscapes of Ukraine and maps in terms of density of sources of fire, fire weather, stocks of combustible materials, other factors of the fire environment, available forces and resources, resources, fire infrastructure, on the basis of which weak links in the landscape are identified. ensure the highest readiness for extinguishing fires.

Key findings

The firefighting period 2019-2020, which continues to this day since March 2019, catastrophic natural fires in 2014 - on agricultural land 330,000 fires with a total area of 1 to 2 million hectares, in 2015 - in the area of alienation 15000 ha, 29.0 3-18.04.2020r. - an area of 28,000 hectares indicates that, as a result of climate change, Ukraine is in new, extreme fire hazards, climatic conditions and that the existing departmental system of protection of forests and landscapes from fires is not able to control this situation in new conditions.

The insufficient attention of central and local authorities over the decades to state support for the protection of forests and landscapes from fires has led to the practical destruction or substantial reduction of the effectiveness of the existing system . New climatic conditions and land use require the development of a new national fire management system and the adoption of urgent legislative, organizational, scientific and training measures at the level of the Cabinet of Ministers of Ukraine, rather than a separate agency, regarding its functioning and tight control over their implementation.

Ukraine's international partners are ready to provide all possible technical assistance to the Government of Ukraine and responsible agencies to create a modern effective interagency system for detecting and extinguishing landscape fires.

General Recommendations for Preventing the Development of Major Fires in the 2020 Fire Period and in the Future

To the President of Ukraine, the Prime Minister of Ukraine

The Government of Ukraine can benefit from international experience in developing national policies in the field of landscape fire management. The Global Fire Monitoring Center (GFMC), based in Germany, is a long-standing partner and supporter of Ukraine, appointed by the Greek Government after the catastrophic fire in Mati (102 casualties) in 2018 as Chairman of the National Committee on Landscape Management in Greece. »[5] . The strategy developed by the GFMC, which was submitted to the Government and Parliament of Greece in 2019, could be an example for Ukraine to develop an inter-sectoral and holistic approach to fire management. The work of the GFMC is supported by the Council of Europe and - through the Agreement on Fundamental Hazards in which Ukraine is a Member State[6] - Organization for Security and Co-operation in Europe (OSCE)[7] .

To resume full funding for the protection of forest fires in the forests of all agencies and to monitor its targeted use .

To create a profession of forest firefighter and fire extinguisher in the occupational classifier of Ukraine. Develop requirements for qualification training of forest firefighters, characterization of hazardous working conditions, requirements for mandatory equipping of forest firefighters, their social protection in the event of burns or death.

Raise the level of preparedness and qualification in the joint extinguishing of forest fires by voluntary units of ATG.

During the formation of long-extreme fire danger forecast (compl ksnyy index above 5000) to decide on the level of NSDC and the Cabinet of Ministers of Ukraine on the personal responsibility of heads of executive power by preventing large-scale natural fires, primarily through the mobilization of concerned agencies (Ministry of Interior, where rzhlisahenstvo and others) involving local activists in patrolling forests and vulnerable landscapes.

Establish a national system for accounting for the number and area of natural fires (grassland grassland, grassland, grassland, peat, fire on agricultural land, fallow lands and other categories of land) based on a combination of statistical reporting of forest and land users and Earth remote sensing data to be provided to the State Statistics Service of Ukraine for summary and publication. Create an official operational platform for the mapping of existing and past fires. Develop a methodology for assessing natural fire damage depending on the type of fire and land category.

Develop an interagency fire extinguishing system for large fires, including the mobilization of forces and means, determine the functional responsibilities of the extinguisher manager and contractors, form the extinguishing management system, forest firefighters safety, the choice of extinguishing strategy and tactics, the order of operational financial, material, cartographic , meteorological, food, medical, household, communications, local residents and their evacuation. Clarify the provisions for the establishment of a firefighting operational staff and departmental staffs.

Support the institutional implementation of the Landscape Fires of Ukraine geoportal developed by the National University of Bioresources and Environmental Management of Ukraine for the Polesie area into land and forestry practices for the purpose of developing and planning fire protection measures and identifying vulnerable areas for fire safety.

Ministry of Internal Affairs of Ukraine

Investigate all arson cases and prosecute perpetrators. Work with departmental fire protection units to ensure the safety of the local population during fire fighting operations.

State Emergency Service of Ukraine

Contribute to the development and visualization of a new system of meteorological support for forest and land users on the site of the Ukrhydromet Center on the current and forecast level of fire danger of the weather. It is desirable to replace the current comprehensive fire risk indicator approved in the 1960s with a more modern one. A number of new indicators have been developed in developed countries , the most popular being the Canadian Fire Weather Index .

To amend the normative documents that will ensure that the level of readiness of the SES units involved in extinguishing natural fires is in compliance with the new indicator of fire risk .

In cooperation with interested agencies, facilitate the updating of the order of involvement of SES units as auxiliary forces and means for extinguishing natural fires in terms of their functions and responsibilities, the operational procedure for determining the type of emergency situation and the procedure for transition from emergency management to a representative of the SNE.

State Agency of Forest Resources of Ukraine

Strictly demand and control the implementation of forest fire safety regulations in forests of Ukraine (2004) by the forestry enterprises , first of all, the strict implementation of the Rules of operation of the forest fire station team depending on the class of fire danger under the weather conditions (Forest regulations, forest regulations , 2005).

Provide for the creation of reserves of fuel and lubricants in the event of extinguishing large fires lasting 5 days or more.

In the event of an extreme fire hazard of weather (more than 5000, V class), suspend or reduce other forestry activities not related to the protection of forests against fires, involve all existing forest protection personnel in patrolling the places with high density of sources of fire, involve drones, Ensure strategic deployment of forces and facilities in the areas most likely to develop large fires, areas with low accessibility, clutter, etc. Arrange for the rapid (15-25 x) arrival of light mobile modules or short fire units (motorcycle, quad bike , etc.) and rapid attack with the use of backpack fire extinguishers and hand tools. Appoint an extinguisher observer. Regulate the strategy and tactics that firefighters must use to meet personal safety requirements.

In the event of a fire occurring in a high natural hazard area, under extreme weather conditions, ensure a rapid and maximally aggressive first mobilization attack by all available forces and units and units involved in accordance with the mobilization plan and under the clear management of the firefighting. Priority in the organization of extinguishing is the safety of the local population in the fire area, the safety of the involved firefighters and the safety of housing and other infrastructure.

Create a single public electronic map of the location of fire and observation towers and their coverage areas, firefighting roads, fire ponds, other infrastructure, and specify the location of the LPS according to their service radii, the density of fire sources, and natural fire classes. To develop the methodology and regulatory requirements for determining the locations of towers, the design and maintenance of cameras, the functionality of cameras, including their connection to the road map and reservoirs, the accuracy of determining the coordinates of fires and the rules of operation of camera operators. Certify companies that have the right to work with forestry companies to install cameras.

To harmonize the Fire Hazard Scale under the weather and the LPS Regulation with the new fire hazard index proposed by the Ukrhydromet Center in cooperation with the State Forest Agency for Climate Change and Land Use Change. Order to prepare for the fire period to prepare depending on the fire danger of the weather (at the onset of III-IV classes).

Determine the functional responsibilities of fire extinguishers of large forest fires, the procedure for their appointment, and organize their preparation and retraining (one per area). Establish a system of qualification training for firefighters of different levels (all employees of forest fire stations, forest guards) and organize their regular training and retraining before the beginning of a fire hazard period and the occurrence of high fire risk of weather conditions.

Justify and approve national or regional time between fire detection and arrival of forest fire departments (15-25 minutes).

Establish documentation systems for all fire prevention and extinguishing measures , including the fixation of preventive measures, the name of the person involved in extinguishing, the extinguisher manager, the process of delegation of authority to the senior manager and other information. To do this, clarify the responsibilities of the fire extinguisher.

Update the Fire Safety Rules in Ukrainian Forests and other relevant regulations in the context of current climate change threats, other land users' activities, criteria for preventive measures, and include standard sections based on current rules (EUROFIRE, ICS or others). Develop handbooks of forest firefighters for use by every firefighter involved in extinguishing. As an example, the Pocket Directory of the Forest Fire Exclusion Zone developed by the Regional East European Fire Monitoring Center in collaboration with the US Forest Service.

Local authorities

Contact public organizations for seminars with local people on the dangers to people and settlements from arson, and measures to improve the safety of the dwelling and action in the event of major forest fires. For this purpose, the recommendations of the Regional European Mono-European Fire Monitoring Center developed in cooperation with the Global Fire Monitoring Center and the Council of Europe (2017) *" Protecting Settlements , Farms and Other Rural Areas from Fires " may be used* .

literature

1. Gilitukha DV, Zibtsev SV, Borsuk OA Monitoring of forests damaged by fires and pests in the Chernobyl NPP exclusion zone according to the SIR data. Scientific Bulletin of NULES of Ukraine. 2011. Iss . 164 M . 3. P. 71-79.
2. Zibtsev SV, OM Soshensky , V.V. Mironyuk , V.V. Humeniuk. Monitoring of landscape fires Cross Border Ramsar site " Olmany -Perebrody" according to remote sensing. Scientific journal "Forestry and agroforestry". - 2019. - №134. - P. 88–95.
3. Jesús San-Miguel-Ayanz , Tracy Durrant , Roberto Boca , Giorgio Liberta Alf , Alfredo Branco , Daniele de Rigo , Davide Ferrari , Pieralberto Maianti , Tomàs Artés Vivancos , D uarte Oom , Hans Pfeiffer , Daniel Nuijten , Thaïs Leray ; Forest Fires in Europe , Middle East and Nort h Africa 2018. EUR 29856 EN, ISBN 978-92- 76-11234-1, doi: 10.2760 / 1128.
4. Zibtsev SV, Soshensky OM, Humeniuk VV, Koren VA Long-term dynamics of forest fires in Ukraine / / / Scientific journal « Ukrainian Journal of Forest and Wood S cience ». - 2019. - P. 27-40.
5. Stohl A, Berg T, Burkhart JF, Fjæraa AM, Forster C, Herber A, Hov Ø, Lunder C, Mc Millan WW, Oltmans S, Shiobara M, Simpson D, Solberg S, Stebel K, Ström J, Tørseth K, Treffeisen R , Virkkunen K, Yttri K. (2007). Arctic smoke - rec ord of high air pollution levels in the European Arctic due to agricultural fires in Eastern Europe in spring 2006. Atmos Chem Phys 7: 511–534. doi : 10.5194 / acp-7-511-2007 .
6. DECLARATION OF THE PRESIDENT OF UKRAINE №80 1/2010. On the decision of the National Security and Defense of Ukraine dated August 5, 2010 "On urgent measures to prevent fire hazard in Ukraine» URL: https: //www.president .gov.ua / documents / 8012010-11766
7. Shvidenko A., Buksha I., Krakowska S. Strengthening Ukraine 's capacity to assess the vulnerability of lowland forests to climate change. Clima East EU Project Report No. CEEF2015-036-UA. 2016. - 126 p.
8. Pocket Directory of the Forest Fire of the Exclusion Zone. Regional Eastern European Fire Monitoring Center, US Forest Service. Kyiv, NULES of Ukraine. 2018 -151 p. Available for download at: https://nubip.edu.ua/sites/default/files/u184/irpg_eng_bez_rozp_tekstu.pdf
9. *Protection of settlements, farms and other objects of rural areas from fires* . The recommendations of the Regional East European Fire Monitoring Center have been developed in collaboration with the Global Fire Monitoring Center and the Council of Europe. Kyiv: NULES of Ukraine, 20 17. - 52 p.

[1] Zibtsev SV, Soshensky OM, Humeniuk VV, Koren VA Long-term dynamics of forest fires in Ukraine / / / Scientific journal « Ukrainian Journal of Forest and Wood Science ». - 2019. - P. 27-40.

[2] Evangeliou , N., Zibtsev, S., Myroniuk ,
V. *et al* . Resuspension and atmospheric transport of radionuclides due to wildfires near the Chernobyl Nuclear Power Pla nt in 2015: An impact assessment . *Sci Rep* **6,** 26062 (2016). https://doi.org/10.1038/srep26062

[3] Jesús San-Miguel-Ayanz et al . ,; Forest Fires in Europe , Middle East and North Africa 2018. EUR 29856 EN, ISBN 978-92-76-11234-1, doi: 10.2760 / 1128

[4] S.Zibtsev, O.M. Soshensky , V.V. Mironyuk , V.V. Humeniuk. Monitoring of landscape fires Cross Border R amsarskoyi territory " Olmany -Perebrody" according to remote sensing. Scientific journal "Forestry and agroforestry". - 2019. - №134. - P. 88–95.

[5] https://www.amna.gr/en/article/283154/PM-Tsipras-presents-new-civil-protection-plan
https://gfmc.online/allgemein/press-release.html
[6] https://gfmc.online/programmes/europe-org/coe.html
llll

[7] https://gfmc.online/globalnetworks/seeurope/SEEuro pe_8.html