MANAGEMENT OF PROTECTED AREAS WITH PRESCRIBED FIRE IN LITHUANIA. THE CASE OF DZUKIJA NATIONAL PARK

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ABSTRACT

The objective of this work is to present the application of prescribed fire as a tool for management in the Dzukija National Park, Lithuania. This was the first legal prescribed fire applied in Lithuania with the objective of improve the habitat of Black grouse for lek. This was an outstanding opportunity to study the impacts of prescribed fire in Black grouse habitat, but also in soil physical and chemical properties and vegetation recuperation in a Eastern European heathland, were few studies about prescribed-fire effects on ecosystems were carried out. The objectives of this short paper are present the objectives of this prescribed management and monitoring studies.

1 INTRODUCTION

Prescribed fire is a widely known tool for landscape management. The great advantages of their application are the reduce of fuel and wildfire risk, habitat maintenance or improvement, research, return fire regimens and fire ecology in the ecosystems, low cost, biodiversity increases and training of firefighters (Pereira et al. 2010). Despite of the well known advantages of landscape management with fire in Mediterranean area, in Eastern European countries little is known about the effects of fire management in the ecosystems. This knowledge is of major importance in order to, if so, return the fire regimen to landscape and contribute to the understanding of fire in these ecosystems. As elsewhere, in Lithuania fire still is looked with some caution by local stakeholders and in extension by government authorities. Only research and a positive approach to the understanding of fire in the ecosystems can, with true and scientific knowledge, try to change the idea of fire as the evil. Landscape management is here a well known problem, since, as in Mediterranean Europe, population is decreasing and older and sustainable land use that millenary shaped the ecosystems that we know today are progressively disappearing. Due this lack of management, deep and important changes are occurring in rural areas, including protected areas. Joining this with the present policies based on fire suppression, forest biomass is increasing dangerously in forest areas, increasing the risk of wildfires and disappearance of ecosystems (as grasslands) due the vegetation expansion, inducing important changes in the biota of these areas.
In this paper we present the first and important step on protected areas landscape management with prescribed fires, the reasons, the objectives and the monitoring research studies carried out until now and in the future.

2 STUDY AREA

Dzukija National Park was established on April 23, 1991. It is located in the southern part of Lithuania, near the border with Belarus (Fig.1). The Present area of the Park it is 58519.06 ha and a great part belongs to Natura 2000 framework. In 2004, Dainava Forest (55964.91 ha) was approved as a Special Protected Area (SPA) according to the Birds Directive. Since 2005, some areas of the Dzukija National Park are also included into the list of Special Areas of Conservation (SAC) of the Habitats Directive (LTVAR0017 Dainava Forest - 54832,62 ha). Since 2011 Čepkeliai State Nature Reserve and Dzūkija National Park were included into the network of PAN Parks as Čepkeliai - Dzukija PAN Park (Fig.1). The maintenance of the biodiversity, including implementation of nature management measures and monitoring, is one of the main tasks for Administration of Dzūkija National Park and Čepkeliai State Nature Reserve.

3 PRESCRIBED FIRE OBJECTIVES AND PREVIOUS MANAGEMENT

One of the key species of this area is the Black Grouse (Lyrurus tetrix), included into Lithuanian Red Data Book and protected according Birds Directive. Due the degree of threat of this specie, the Dzukija National Park authorities begun in 2005-2006 the project untitled “Restoration of Black Grouse Habitats in Dzukija
National Park” with objective to ensure favorable conditions to one of the biggest populations of Black Grouse in the south Lithuania, improving breeding, resting and feeding conditions for this species. The area of the project is located in a former old Soviet army military training ground. During the period of intensive military use of the area (1945-1991) a continuous disturbance in this areas was done by the military activities, favoring the permanence of an open area and optimal for heathland vegetation development. It is very likely that these areas were the best for black grouse leks in whole Dainava forest, where usually it was possible to observe 30 - 40 leking males in spring. The ending of military activities and vegetation expansion resulted into a Black Grouse population decline due the decreasing open areas for lek.

The mentioned project was financed from EU structural funds, was implemented in the southern part of Dzūkija National Park in the forests of Musteika forestry, managed by Druskininkai State Forestry Enterprise. This area is closely related to ecosystems of Imskai telmological reserve and Cepkeliai Strict Nature reserve of very big importance for wildlife especially birds (Svazas et all 1999).

In order to recover the best conditions for Black grouse population increase, the first management step was clear cut of 5-15 year Scots pine (Pynus sylvestris) and birch (Betula sp.) trees that since the military activities abandonment start to colonize this territory, in the area of 34.5 hectares. Five open areas, connected each with other, were created in the territory of 150 ha.

Since 2007 these open areas were maintained by mechanical removing of Betula, Populus tremula or Salix shoots. From 2010 tractor and mowing equipment started be used for cleaning of area and keeping heathlands. Due such activity management of heathlands was favourable for such protected habitats as inland dunes with open Corynephorus and Agrostis grasslands and European dry heaths, populations of Arnica montana, Trifolium lupinaster, Pulsatilla patens and other protected species, a number of leking Black Grouse males

Figure 2. Prescribed fire in Dzukija National Park.
increased to 10–15.

Other nature management methods widely used in many parts of the world is the prescribed fire. The natural or human fire disturbance was a very important ecological factor in important for dry pine forests of South Lithuania as well as for raised bogs, that was suppressed from these forests. In this area there are some evidences of fire ancient presence, as trees scars in centenary Scots pine that helped to understand the ecological importance of fire in Dzukija national park ecosystems. Based on the experience of Great Britain and Latvia, where prescribed fire were applied, inside the Life project Restoration of Biological Diversity in Military Training Area and Natura 2000 site “Adazi” in 2009 it was applied a prescribed burning in some heathland areas of the Dzukija national park. In the same year it was authorized by the Lithuanian Environmental Ministry as the pilot experiment of using fire in the nature management. Due the unfavorable meteorological conditions the realization of the prescribed fire was not possible in 2009-2010. Only in the autumn of 2011 it was proper situation and on October 18 the first prescribed fire in Lithuania was implemented by the protected area staff with the assistance of the Druskininkai State Forestry Enterprize. (Fig. 2). Overall 5 plots of 10.1 ha area were burned on the swells of the ground with purpose to create open plots for Black Grouse mating and to renew heathland communities (Fig. 3).

4 Monitoring of Prescribed Fire Impacts

With the application of the prescribed fire it was a wonderful opportunity to study the impacts of fire in an area where studies are absent, and contribute to a better understanding of fire effects in Lithuanian heathlands. The first objective of the prescribed fire was for improving conditions for Black Grouse lek, due the population decrease. The management of landscape with prescribed fire will allow us to understand the effects of this treatment in this specie. The project LitFire, “Fire effects in Lithuanian soils and ecosystems (Nr. MIP-11387)” founded by the Lithuanian Research

![Figure 3. Areas where the prescribed burning treatment was applied](image-url)
Council allow us to make research in this area on the fire impacts on soil properties and vegetation recover. This have a great additional values since is the first prescribed fire applied in Lithuania. Inside the scope of the mentioned project and Dzukija National Park, we pretend to observe:

- Study the effects of the prescribed fire in soil physical and chemical properties at short, medium and long-term.
- Evaluate vegetation recovery and diversity in the burned plot areas.
- Monitoring of changes in the Black Grouse population.
- Identify if prescribed fire it is a sustainable treatment for protected areas landscape management
- Contribute to the knowledge of fire role in Eastern European ecosystems.

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