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FOREST FIRE IN THE SÃO DONATO STATE BIOLOGICAL RESERVE: CAUSES, DAMAGE AND LEARNINGS

José Rodrigo Fernandez Caresani

Karine Matte Senger

<https://orcid.org/0000-0002-4298-9887>

Mauricio de Freitas Scherer

<http://lattes.cnpq.br/4816142153643626>

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Abstract: The documented event consists of a large-scale forest fire that occurred in January of 2022 at the São Donato State Biological Reserve, located on the West Border, while the state of Rio Grande do Sul was under the effect of a historic heat wave. The data and audiovisual materials that make up the cinematographic work generated are the result of extension and research projects, course conclusion works (associated with the Bachelor in Environmental Management at Uergs), the performance of SEMA through its rangers and the collaboration of firefighters and volunteers who fought the fire. The fire is classified as a surface fire, in which a headwater developed that consumed a large part of the wetland that makes up the reserve, the fire and smoke released caused a disturbance for thousands of people in the region, in particular the municipality of Maçambará, in addition the escape of hundreds of animals. The mode chosen in the montage was the expository, which is characterized by the use of voices and subtitles addressed to the public, it is the predominant mode in the making of documentaries. The work on display includes aerial drone and crop plane images of the affected area, data from fauna and flora surveys, mapping and characterization of the burned area, water recovery of the wetland consumed by the flames, monitoring of the spontaneous regrowth of vegetation. The elaboration and dissemination of the results obtained generated awareness, reflection and epistophilia in the society affected by this historic event.

Keywords: Environmental documentary; Environmental damage; Wetlands.

INTRODUCTION

The National Institute for Space Research (INPE) created the Queimadas program, which for more than 35 years has been developing orbital monitoring tools for wildfires and

forest fires in Brazilian territory. Essential for the conservation and management of forest resources and the ecosystems that shelter them, the protection of lives and the provision of solid subsidies for the establishment of public policies (SETZER; FERREIRA, 2021).

In the Queimadas program, it is possible to work with the Focus in APs (protected areas) tool, which informs the occurrence of fire in preservation areas, such as national and state parks, forests, municipal, state and national biological reserves, and indigenous lands (INPE, 2022). However, this program has limitations, the fire that occurred in the São Donato State Biological Reserve (Rebio São Donato), can be cited as an example of the need for more detailed studies, in the said tool, the fire appears in the report of January 15, 2022, however the data made available by INPE are almost null on this particular fire.

More targeted studies carried out by professionals who know the location affected by the accident, who immediately started field work, are essential to understand the causes, magnitude and consequences of the large-scale forest fire that occurred, within an environmental reserve inserted in the Brazilian Pampa Biome.

Within this context, environmental documentaries combined with research projects, course completion works, collaboration with conservation unit managers, become an excellent way to record, narrate and publicize the environmental disaster that represents the large-scale fires in the reserves. biological plants that were affected by the heat wave that hit Rio Grande do Sul in January 2022.

The most striking feature of the Rebio São Donato forest fire was its intensity, consequently it was a short-lived event, whose combat measures needed to be taken and executed in a few hours, however, the effects on the affected ecosystem took months to

minimize. It was the first major fire to break out on the Western Frontier in 2022, forming part of a historic review of claims that persisted into the summer of 2023.

Rebio São Donato was created by Decree number 23,798, of March 12, 1975, by the government of the State of Rio Grande do Sul, despite an existence that approaches half a century, the public power still faces difficulty in establishing an effective management in the reserve, land use and occupation conflicts associated with a “water dispute” that has existed since its creation still generate disagreements between the public authorities and producers.

A multitemporal analysis of cartographic products, dating back to the creation of the reserve, was carried out by BETTIN (2021) in his course completion work (TCC) in which it is possible to verify that the phytophysionomies that represent the original area of the reserve continue to shrink even after creating the reservation. However, some obvious advances must be mentioned, in 2021, the land title regularization of the reserve began, consisting of the acquisition of 732 hectares (SEMA, 2021), representing 17% of the reserve. Interestingly, this fraction acquired by the State, which was also affected by the fire, consists of the fraction belonging to the municipality of Itaquí, which is an area bordering the BR-472.

The maps, graphs, radiometric transformations, vegetation indices, which appear in the documentary, are the result of a course conclusion work (SENGER, 2022). The author of this TCC is the scholarship holder who appears in the environmental documentary playing the role of a reporter.

In Rebio São Donato, there was a convergence of factors in January 2022, which include: the existence of low vegetation, dry, ideal for the rapid spread of the flames; extreme weather conditions, which include

high temperatures and low air humidity (thermal sensation greater than 50°C); illicit drainage carried out by some farmers within the swamp, without an environmental license; a direction and intensity of the wind that favored the propagation towards the marsh (phytophysionomy more susceptible to combustion).

In addition to biophysical factors, there were logistical problems, access to the affected area is very difficult, firefighters in the region are used to dealing with small urban fires, and did not have equipment to combat large-scale forest fires. The absence of an action plan generated many doubts about how to proceed.

This whole situation generated fertile ground for the elaboration of an environmental documentary, according to NICHOLS (2016) documentaries stimulate epistophilia (a desire to know) in the public. In the best examples, it conveys an informative logic, a persuasive rhetoric and a moving poetics, which promise information and knowledge, discoveries and awareness.

As important as knowing how to use good cinematographic equipment correctly is knowing how to produce a film without it, knowing how to write a script that can really be produced, creating a good photograph without the ideal reflectors; produce without money (MOLETTA, 2019). Documentary, unlike fiction, is the editing (or not) of audiovisual content captured by varied and different devices (camera, camcorder, cell phone) (LUCENA, 2018).

The method chosen to assemble and edit the documentary about the forest fire at Rebio do São Donato is the so-called expository mode, which according to NICHOLS (2016) addresses the viewer directly, with subtitles or voices that propose a perspective or expose an argument. Exhibition documentaries emerge early in the documentary tradition and remain prevalent today. This mode prioritizes the

spoken word to convey the film's perspective from a single, unifying source. This, in turn, facilitates understanding.

Therefore, the objective of this publication is to narrate the making of the environmental documentary produced from one of the most intense forest fires in the history of Rio Grande do Sul, which temporarily suppressed an ecosystem that serves as a shelter for the wild fauna and flora of Rio Grande do Sul.

MATERIAL AND METHODS

The environmental documentary produced is the result of the academic activities of professors and students of the bachelor's degree in Environmental Management at ` ` Universidade Estadual do Rio Grande do Sul` ` , who work at the unit in São Borja and region, highlighting the performance of the course coordinator prof. doctor José Rodrigo Fernandez Caresani and the coordinator of the Applied Environmental Management Laboratory (LAGEAA) prof. doctor Ricardo de Vargas Kilca, in partnership with SEMA through park ranger Maurício de Freitas Scherer, who was the official manager of the Biological Reserve affected by the accident, in addition to some collaborations from the authorities and members of civil society who faced the fire. Figure 1 represents the technical/academic context in which the environmental documentary was developed, which aims to sensitize society around this environmental disaster.

The analysis of Figure 1 allows the visualization of the context of studies that preceded the forest fire, the actions carried out during the accident and the post-fire studies/disclosures. The fact that it was a reserve that was already being studied allowed for a quick action by the researchers, who already had knowledge of land use and occupation, hydrography, information on fauna and flora.

The geographic proximity between the

university unit of Uergs in São Borja and Rebio (between 40 and 50 km) allowed several visits to the affected area in order to understand the event and assess the water and plant recovery of the swamp consumed by the flames. Because it was an event that demanded the attention of several institutions and multiple professionals, a work of dialogue, conversations and exchange of materials was established in the region, which enriched the narrative and audiovisual records.

RESULTS AND DISCUSSIONS

The final version of the documentary has 19 minutes and 27 seconds, a preliminary and shorter version was shown in Maçambará in 2022, in the presence of several people who relived this regional environmental episode. A virtual exhibition event was organized in December 2022, in which the obtained data were discussed. An improved version was exhibited at the São Borja City Council, in plenary in 2023.

The documentary was posted on YouTube, the link for viewing it was widely publicized on January 15 and 16, 2023, when the fire completed one year, the documentary can be accessed at <https://www.youtube.com/watch?v=tSW00YKcolk>

In a general and traditional way, this documentary can be divided into three parts: introduction, development and conclusion. Figure 2 presents an illustration of the structure of the produced documentary.

Figure 2 is associated with the content displayed during the documentary, the handshake that appears, symbolizing the partnership established between Uergs, SEMA and society, in the search for a genuine audiovisual product that is representative of the documented environmental disaster. The opening narration emphasizes the strong heat wave that hit Rio Grande do Sul in January 2022, which represents one of the

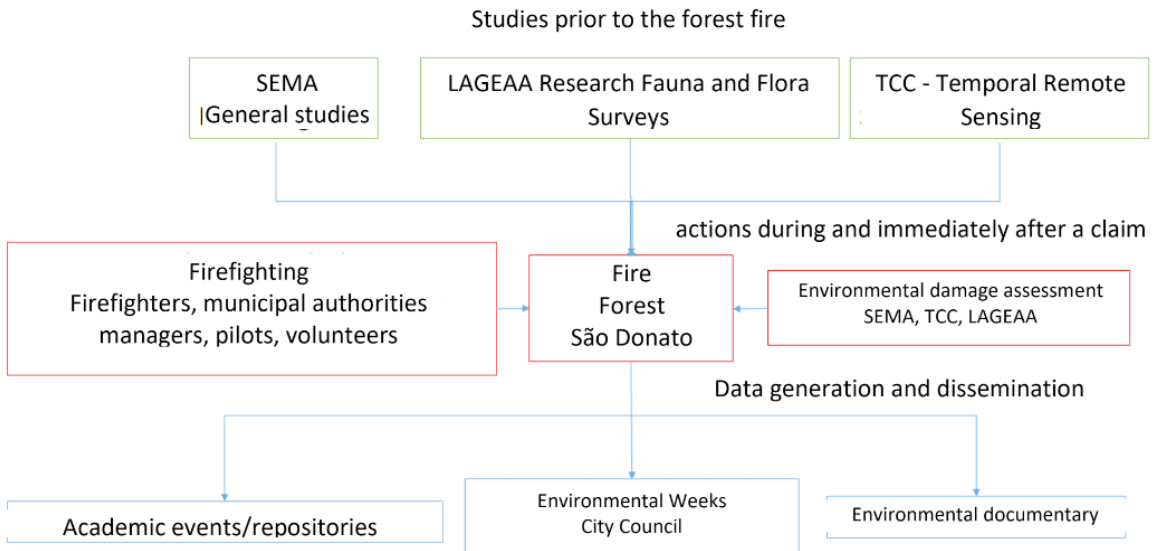


Figure 1. Flowchart that outlines the technical/scientific performance around the Sao Donato State Biological Reserve.

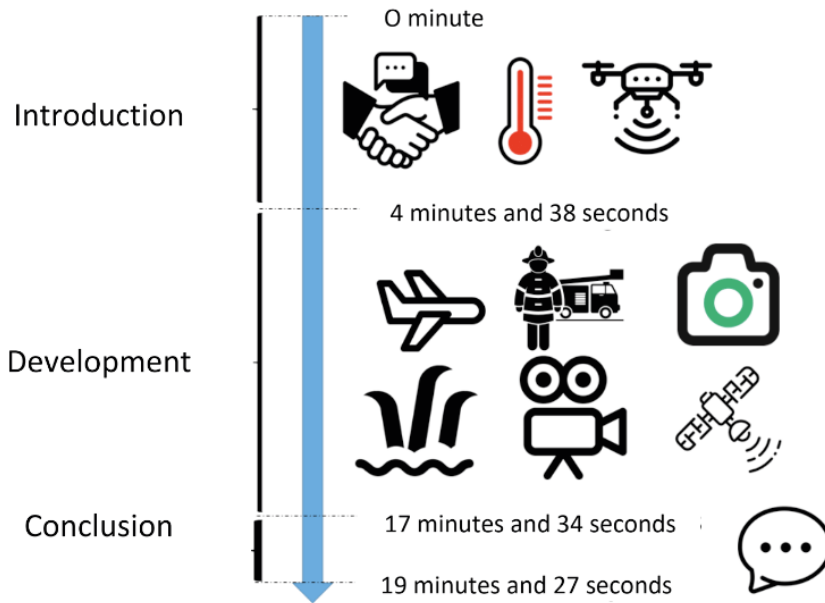


Figure 2. Structure in which the documentary can be divided.

most important factors in the uncontrolled spread of the flames. The containment forces moved to the affected site had to withstand temperatures above 40°C and a thermal sensation close to 50°C.

The aerial images obtained by drone are a contribution from the Applied Environmental Management Laboratory which is responsible for the fauna and flora surveys at the Uergs in São Borja, the initial images consist of a montage made a few months before the fire, combined with data from SEMA provide a captivating view of this environmental reserve located in Fronteira Oeste. The aerial images make it possible to identify the main phytophysognomies that make up the biological reserve, which is unknown to most gauchos. It also presents unpublished estimates of fauna and flora, as it is a place far from other universities and research groups.

The development of the documentary begins with images of the takeoff of one of the collaborators in the fight against the fire, it is the agricultural pilot João Reichet who, using his knowledge, carried out some flights destined to unload water in the active fire, the courage shown by the pilots involved in the Fighting the flames generated admiration from firefighters who are used to facing dangerous situations. The aerial images of the active fire were widely publicized in the virtual media, generating concern in the population and in various spheres of public administration. The “headboard” that formed generated a smokescreen that strongly affected the region, the city of Maçambará located approximately 14 kilometers away was the one that suffered most from the polluted air released by the fire, which has 4,539 inhabitants (IBGE CIDADES, 2021).

The documentary continues with the narration of Lieutenant Fabiano Maciel, CMT firefighter in São Borja, who narrates the action of the authorities in an attempt to control the

burning, this testimony provides important information, it is evident in the narration that this event mobilized many units in the region. Afterwards, photographs are displayed that show the SEMA team carrying out field work, in these photos it is possible to see the park ranger Mauricio de Freitas Scherer, official manager of the biological reserve at the time of the fire, there are internal reports associated with inspection actions, linked to capture irregular flow of water from the wetland, which point to improper drainage of the wetland as one of the factors that preceded the fire.

The academic documentary continues with post-fire activities, in which Uergs academic Karine Matte Senger appears playing the role of field reporter, providing relevant information on the burned area, highlighting the intensity and direction of the wind on days of active fire, which was one of the factors that explain the spreading of the flames in the portion occupied by the marsh.

Some physical barriers were crucial for controlling the fire, as is the case of the irrigation channel that cuts through the reserve and divides the swamp from the crops that are located inside and around the reserve. Interestingly, after the big fire, there was a period of a few days in which small fires continued to burn within the already affected area, demonstrating that there was still biomass susceptible to burning in the affected area, these micro fires continued to emit smoke for a few days, they are visible in the documentary footage.

The use of geographic information systems was crucial for an accurate and genuine analysis of the affected area. The displayed maps make it possible to visualize the legal limit of the reserve, the BR-472 that crosses the site, being the limit of the municipalities of Itaqui and Maçambará, in addition to the area consumed by the flames, which totals

approximately 1,000 ha.

The post-fire analysis also includes records associated with the spontaneous vegetation regeneration of the swamp, the return of fauna, in addition to the water recovery recorded through images of the structures below the BR-472, through which the accumulated water drains, ideal places to monitor the situation. wetland water.

Another important aspect that was included in the documentary was the presence of garbage on the edge of the BR-472, in the extreme weather conditions associated with the strong heat wave present in January 2022, materials such as aluminum, glass and paper can initiate / feed the initial focus of forest fires. The testimonies suggest that the fire started close to this road, therefore preventive cleaning in this place is strategic to reduce the risks of this environmental tragedy repeating itself.

The documentary ends with a reflection by the director, in a climatic situation that is totally different from that which preceded the fire, which demonstrates the climatic contrasts that characterize Rio Grande do Sul. The credits show those involved in the making of the documentary.

A consequence of the scenario of climate extremes that are characterizing Brazil in the 21st century is Law Number 14,406 of July 2022, which determines that contingency plans for combating forest fires by Sisnama bodies will contain guidelines for the use of agricultural aviation in fighting fires in all types of vegetation.

FINAL CONSIDERATIONS

The aerial fight against the fire at Rebio do São Donato, through water discharges in the active focus, despite representing a heroic act and a lot of bravery by the pilots, proved to be inefficient in that circumstance, due to the high temperature and strong wind. Some

actions in the field, in places not yet reached, with the help of agricultural machinery, represented a more effective control, in the chaos that characterized this event.

The collaboration between the university, SEMA, firefighters, civil society generated a documentary that allows you to visualize the characteristics of the reserve before the fire, the fight against the fire, to which are added climatic/water weightings of the affected place discussed in course conclusion works, in addition to the spontaneous plant recovery of this ecosystem.

The analyzes and disclosures associated with the documentary allow us to conclude that forest fires in the Brazilian Pampa Biome is a subject that has been little studied in Rio Grande do Sul, rarely disclosed in academic circles in Rio Grande do Sul and with scarce prevention actions. However, we can consider that the documentary of the fire that occurred in Rebio São Donato is well known in Rio Grande do Sul, being part of the South Summit program held from March 29 to 31, 2023 in Porto Alegre, in addition to regional dissemination.

THANKS

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I would like to thank Lieutenant Fabiano Maciel of the CMT of the São Borja Fire Brigade for narrating the action of the firefighters in the incident studied, who also provided audiovisual materials for inclusion in the documentary. Thanks also to the agricultural pilot João Reichert, who collaborated in the fight against the forest fire and provided audiovisual materials for the elaboration/editing of the environmental documentary.

The authors of this documentary want the audiovisual product generated to please the general public, to be a source of reflection and to generate greater interest in the conservation

of the biodiversity of the Rio Grande do Sul reserves, whose management is still under construction in the reserves of the West Frontier of Rio Grande do Sul.

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