

# ADAPTIVE MANAGEMENT PLAN

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BUGNAVILLA  
AFFORESTATION THROUGH  
HIGH-QUALITY TIMBER OVER  
DEGRADED GRASSLANDS

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VERRA Project ID 3623

# INTRODUCTION

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The adaptive management plan is prepared to identify, assess and create a mitigation plan for potential project risks that may be an obstacle to project implementation. They include a process to monitor progress and document lessons learned or corrections that may be necessary, and incorporate them into project decision-making in future monitoring periods. There is a system in place to adapt to changing circumstances that may complicate initial project planning.

Carbosur coordinates efforts with Pike Consultora Forestal to maintain proper follow-up and monitoring of the status of the plantations in order to respond quickly to the occurrence of any event or circumstance that alters the management plan.

The first step in developing the adaptive management plan is to assess the potential risks that the project may face, which involves considering current as well as future risks. Therefore, a periodic reassessment of risks is necessary in order to be prepared for any eventuality that may threaten the normal implementation of the project.

Once the potential risks have been identified, a set of preventive measures should be considered, as well as management measures in the case of the occurrence of the problem.

When a problem appears, it is reported and then the incidence and severity of the case is evaluated. In this sense, action is taken as previously planned.

Afterwards, the results of the applied measure are monitored and evaluated and a report is submitted which will be taken into consideration for future actions.

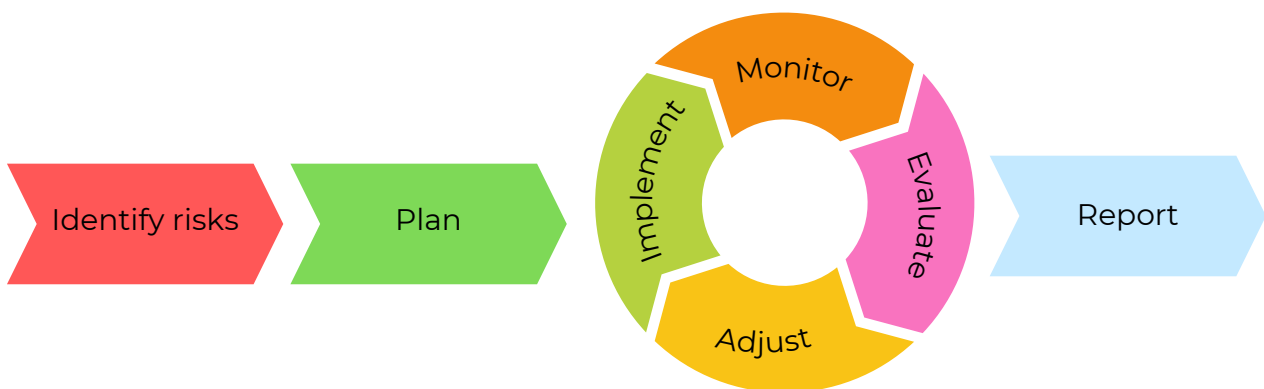


Figure 1. Adaptive management plan process

# IDENTIFY RISKS

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In the national context of Uruguay, the risks that forest plantations may face are not numerous, as it is a country that offers many guarantees considering the stability of its policies and governance. It is a country that has several forest protection and fire protection laws (as detailed in the Project Description), and considering that there is no deforestation and occupation of forests by indigenous peoples (they do not exist in the country).

Therefore, the risks to be taken into consideration for the elaboration of the management plan are mainly risks from natural phenomena. These include risks associated with abiotic factors such as wind damage, hail, frost and fire, and risks from biotic factors such as pests and diseases.

Main risks of forestation in Uruguay:



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Forest fires, being localised, are the most avoidable of the risks that a plantation may have, as the scope of preventive measures is greater than in the case of large-scale natural phenomena. Likewise, the damage that can be caused is great loss of biomass. This is why, as a requirement for registering a forest plantation in Uruguay, a Fire Prevention Plan must be submitted. In this way, the generation of fires is prevented and rapid action is taken in case of occurrence.

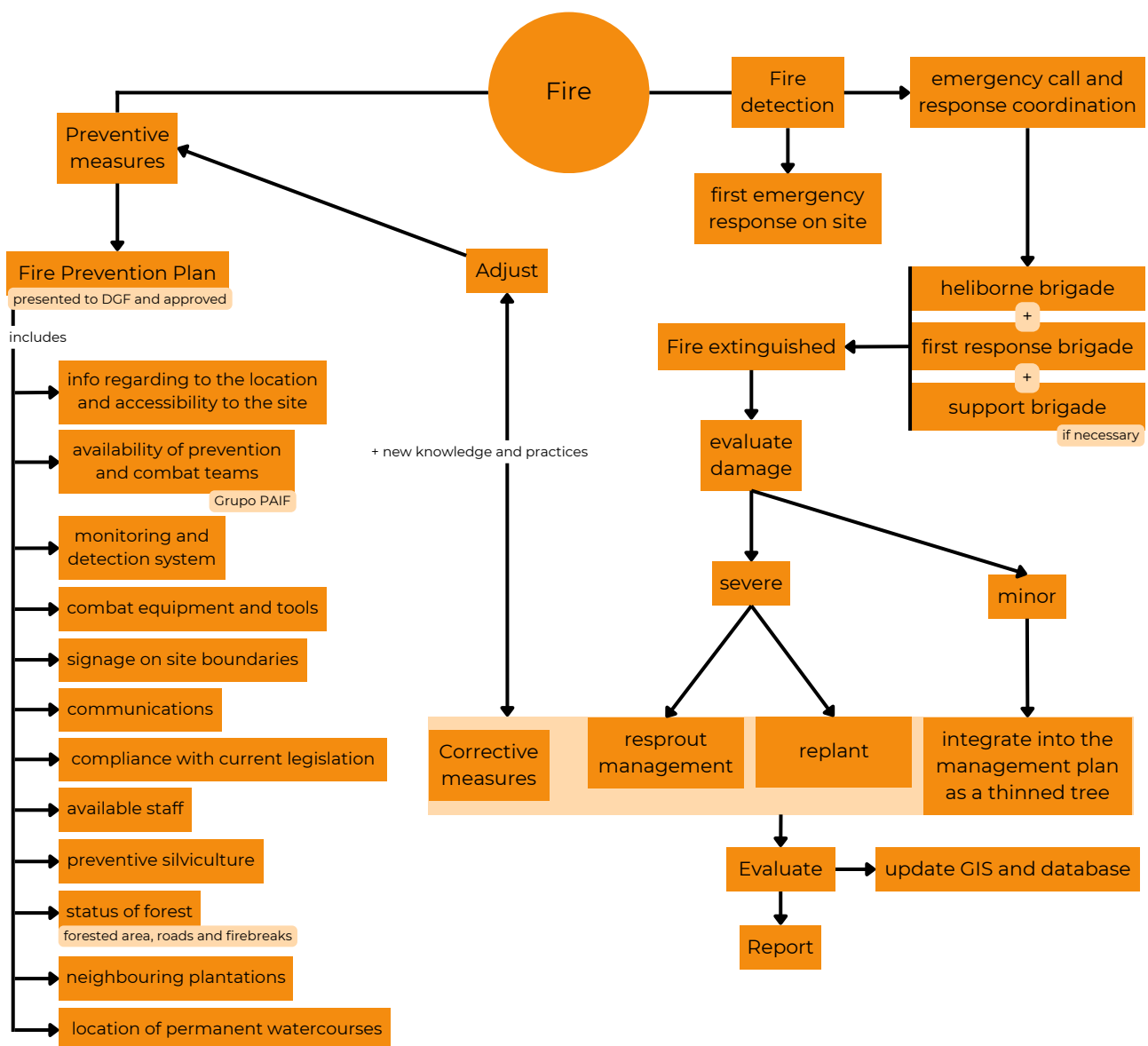


Figure 2. Adaptive management plan for fire risk

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The risk of pests or diseases appearing in the plantation is dealt with in a particular way. Firstly, the aim is to obtain clean germplasm that is best adapted to the presence of known pathogens in the country. If a pathogen is detected, the bibliography is used for identification and disease management. In addition, corrective measures are taken, according to the literature and according to the incidence and severity of the disease.

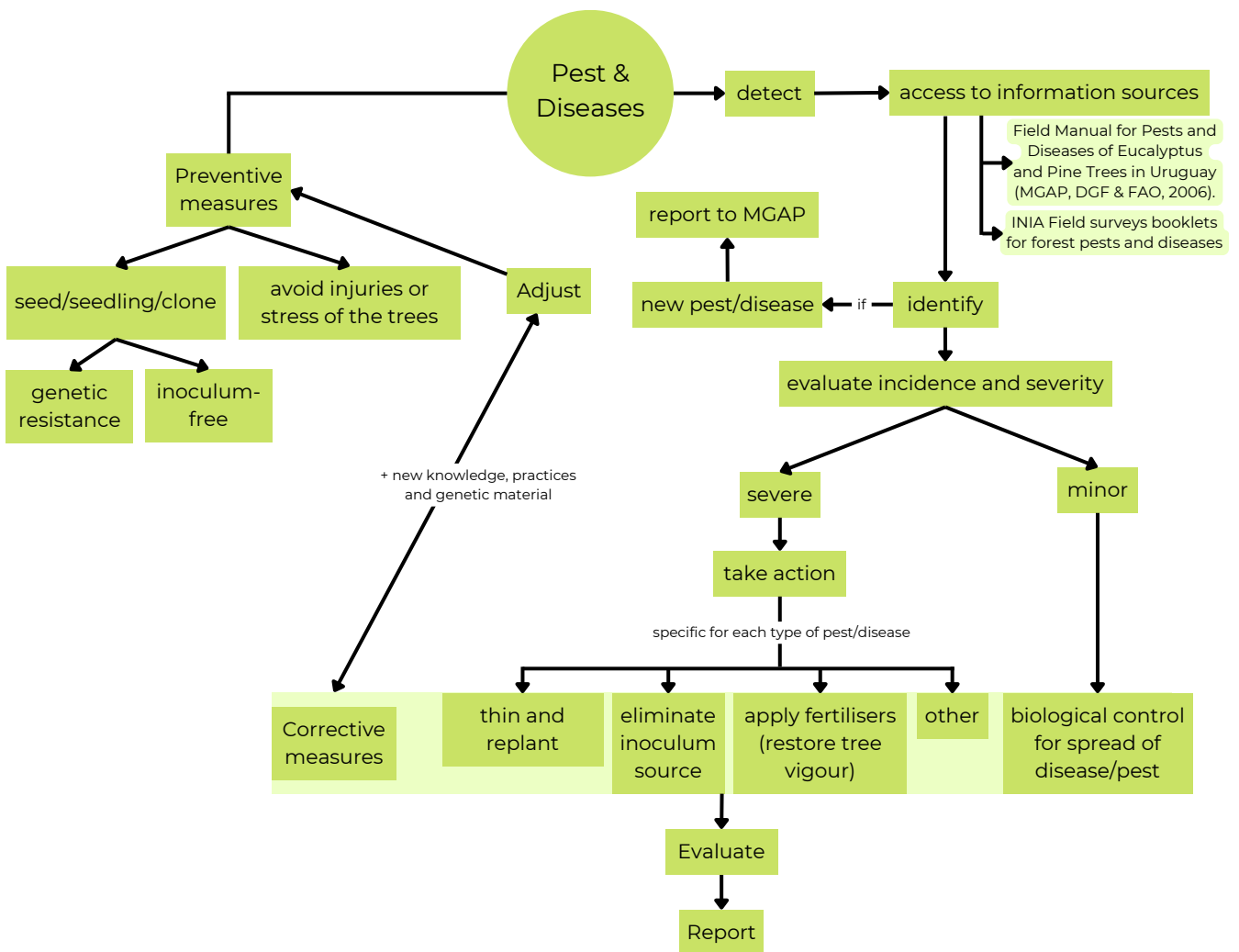


Figure 3. Adaptive management plan for pest and diseases risk

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In the case of frost harm, management is very similar to that of wind or hail damage, as it causes very similar damage to the plantation. Moreover, these are natural phenomena that are impossible to avoid. The only possibility is to minimise their impact and to act effectively if they do occur in order to prevent the loss of a large amount of biomass.

Once this extreme weather event occurs, the damage caused must be assessed and, depending on the severity and characteristics of the damage, measures are taken.

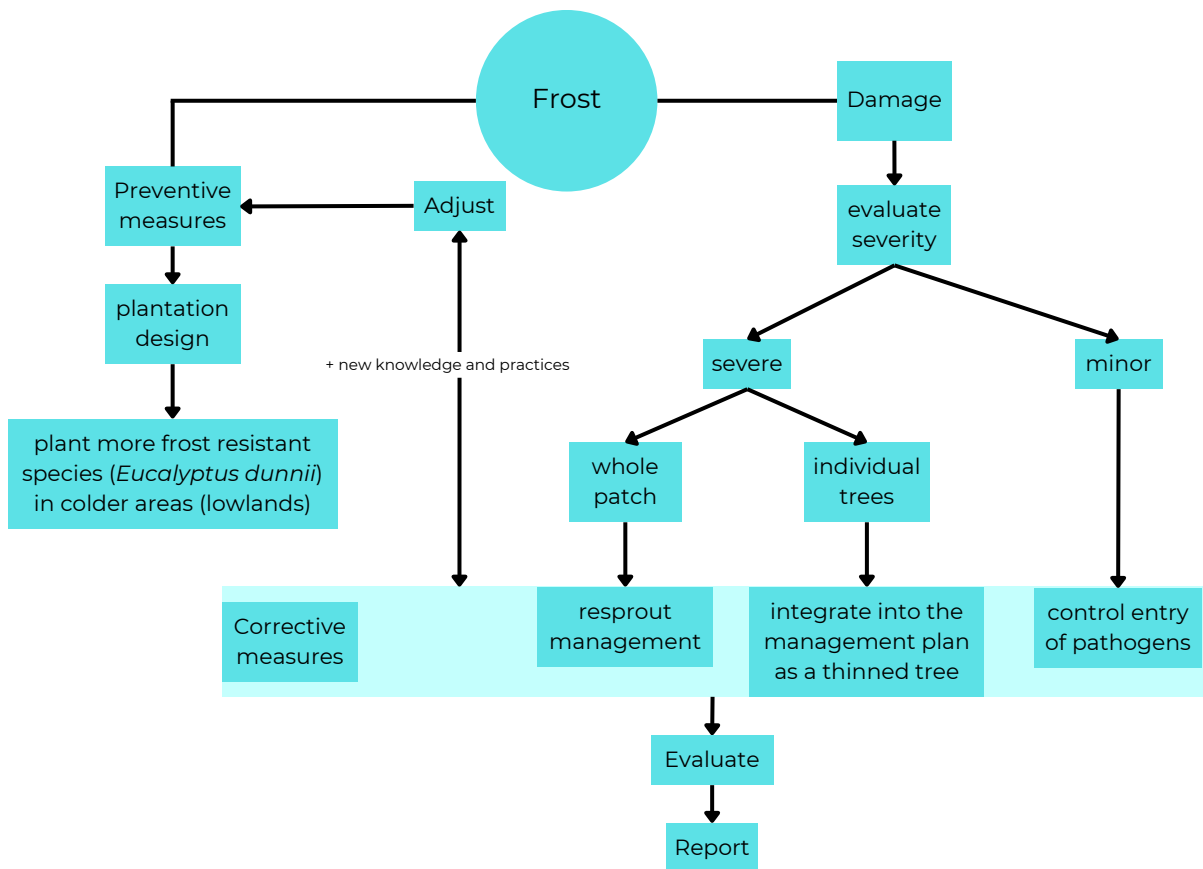


Figure 4. Adaptive management plan for frost risk

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In response to drought, forest species show different adaptation mechanisms that arise from their own characteristics, from their adaptation to the environment in which they originated and to the changes it has undergone in the course of the planet's evolution.

In this sense, as a preventive measure, gel is applied at the time of planting if it is known that dry days are on the way, and seek to obtain seed from selected material for its good root exploration characteristics.

In case of drought, if feasible, the driest parts are irrigated and if the severity increases, different types of corrective measures can be taken.

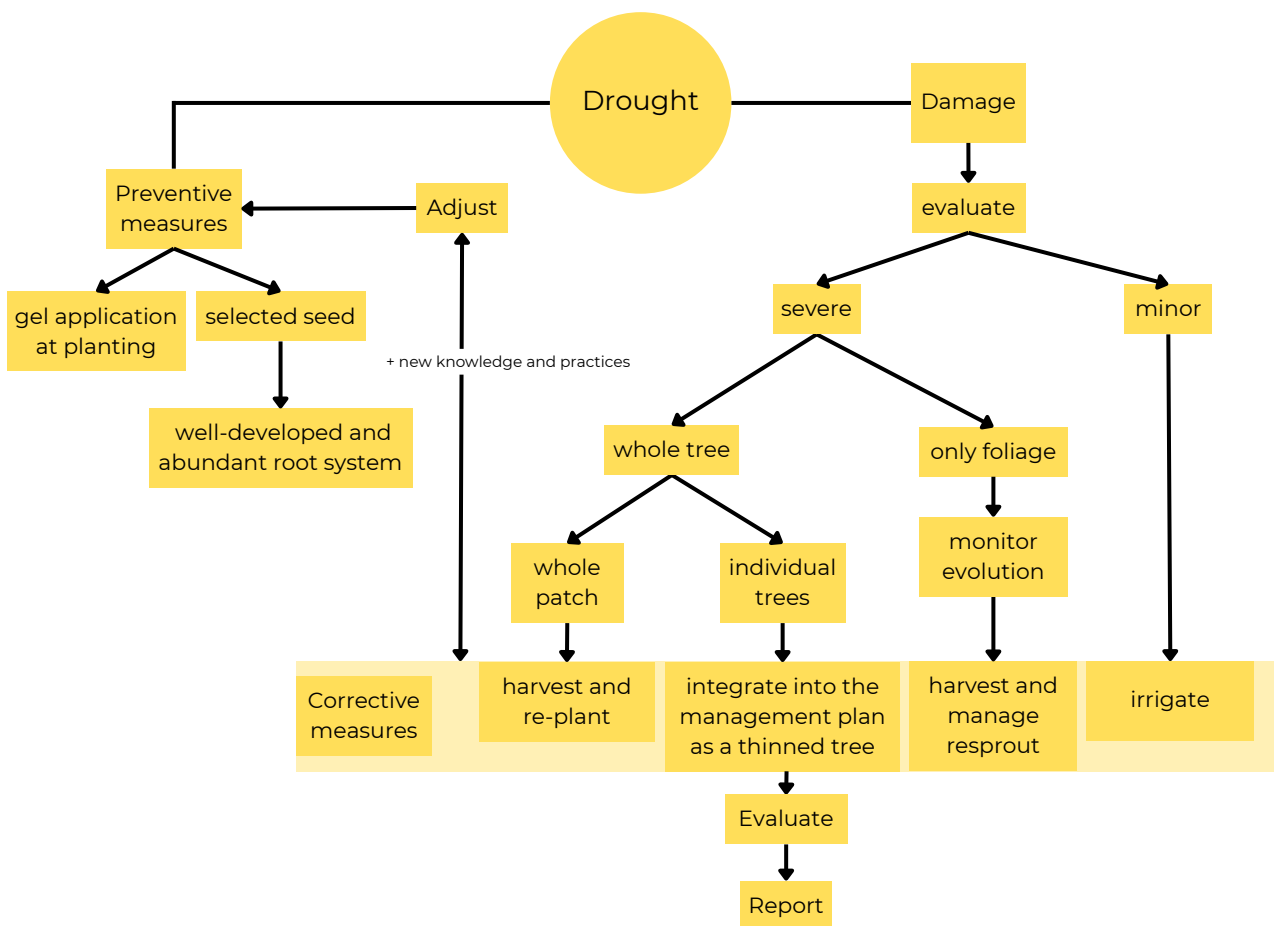


Figure 5. Adaptive management plan for drought risk

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Each risk is approached differently and, consequently, work is carried out on prevention measures and measures of action to deal with the occurrence of each of these phenomena. When developing the management plan, these risks are foreseen and integrated into the planning.

With regard to wind damage to the forest plantation, preventive work is carried out trying to avoid wind acceleration through the plantation design. While if wind damage occurs, a series of measures are planned according to the severity of the case.

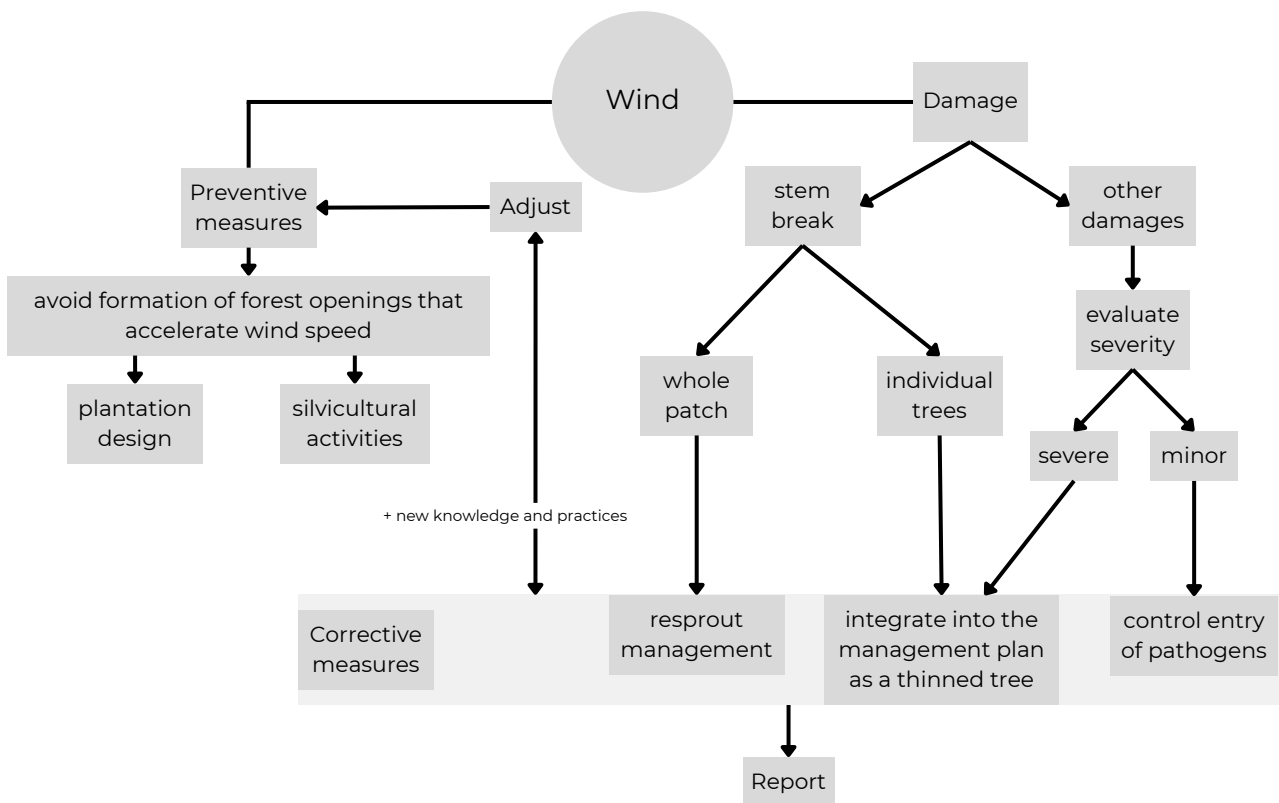


Figure 6. Adaptive management plan for wind risk



# PLAN

Hail is an unavoidable climatic event and due to the scale of forest plantations, there are no preventive measures available today. Action can only be taken to ensure that the damage caused generates as little loss as possible.

As well as wind damage, the injuries caused will slow down the growth of the tree, and the wounds can be an entry point for pathogens that can make the situation worse.

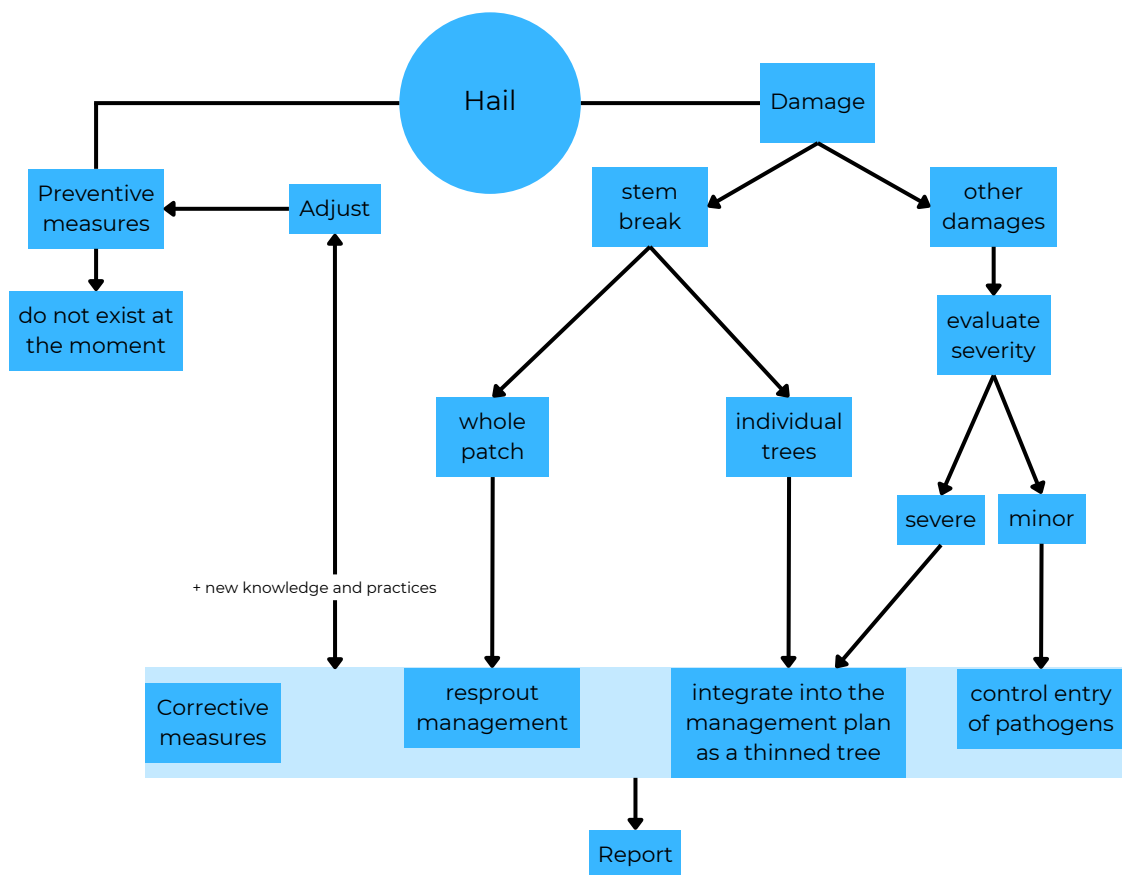


Figure 7. Adaptive management plan for hail risk

# SUMMARY

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The Carbosur and Pike Consultora Forestal teams put their knowledge into practice and developed this Adaptive Management Plan, which seeks to systematise the management model so that the steps to be taken in the event of one of the events that alter the normal functioning of the carbon sequestration forestry project are known.

In this sense, preventive and corrective measures are available for each of the risks that may occur, so that the impact of the damage that may be caused is as slight as possible, and the measures that can be taken are adjusted according to experience and new knowledge/practices/genetic material that may arise.

In addition, there is a process in which the results of the measures taken are evaluated for future occasions and to provide feedback to the process. Each event is reported in such a way that records are kept.

This document states the project's commitment to adapt the management plan based on monitoring results. This project strategy is maintained throughout the entire lifetime of the project (100 years).