



Technical study Control of two invasive alien plant species in the savannas of French Guiana Life BIODIV'OM (2018-2024)























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Savane of the Mornes © Vincent BRIONES



#### The LIFE BIODIV'OM project

The LIFE BIODIV'OM project is a European project, coordinated by the LPO (League for the Protection of Birds) and implemented from 2018 to 2024, which aims to protect biodiversity in 5 French overseas departments: Réunion, Martinique, Mayotte, Saint-Martin and French Guiana. These territories are home to 80% of France's biodiversity, including exceptional fauna and flora unique in the world. But they are currently facing strong anthropic pressures and disturbances. The aim of this project was therefore to limit the decline of this natural heritage by implementing concrete conservation actions. It focused on 5 globally endangered species (the Réunion cuckooshrike, the white-breasted thrasher, the Malagasy pond heron, the Nassau grouper and the Atlantic goliath grouper) and a rare habitat: the savannas of French Guiana.

Supported locally by the Group for the Study and Protection of Birds in French Guiana (GEPOG,), the project is divided into two parts: concerted, sustainable management of the Atlantic goliath grouper, and savanna conservation. The latter builds on the results of a first project: LIFE + CAPDOM (2014-2018), which, among other things, enabled the acquisition of new knowledge (inventories and monitoring of fauna, flora, pedology, uses and perceptions of the savannas, etc.) and highlighted a threat: invasive alien plant species, particularly black wattle (*Acacia mangium*) and paper bark tea tree/niaouli (*Melaleuca quinquenervia*). As a result, GEPOG decided to become more directly involved in controlling these two species within the framework of LIFE BIODIV'OM.

Despite their small surface area, representing 0.22% of French Guiana's territory, French Guiana's savannas are home to almost 17% of French Guiana's flora and many emblematic species such as the giant anteater, the South American rattlesnake, the bearded tachuri or the eastern meadowlark.

Thus, from 2018 to 2024, numerous actions took place in order to achieve the following objectives:

- Draft a control plan for Acacia mangium and a control strategy for niaouli the two documents forming the basis of the fight against these invasive alien species on a regional scale;
- Ensure that 50-70% of French Guiana's savannas and 100% of its protected natural areas are free of Acacia mangium;
- Validate a method for controlling niaouli in French Guiana;
- Raise awareness among the local population, stakeholders and decision-makers.

Savanna Tir à l'arc © CNES



### LIFE actions specific to savannas

The first stage of the project aimed to prepare for the implementation of acacia and niaouli management actions, by developing strategies and identifying local species to replace *Acacia mangium*. This action required a considerable amount of time devoted to coordinating with stakeholders, leading working groups, drafting strategies and identifying protocols for testing niaouli management methods. The *Acacia mangium* control plan and the niaouli control strategy for French Guiana were finalized in September 2021.

Acacia mangium control has been carried out in several stages since the start of the project. The first phase involved an inventory of the species and the state of invasion of the savannas, enabling us to precisely define the trees' location and diameter. This also enabled us to define certain savannas as priorities: savannas included in protected areas and savannas relatively uninvaded by *A. mangium*. Secondly, a large number of felling operations were carried out. These sites were then monitored every 6 months to count and remove any regrowth.

In the case of niaouli, numerous tests were carried out on both a small and large scale to find an effective active control method – in particular by approaching other areas with the same problem. A nursery study was also carried out to test different seed bank management methods.

At the same time, a number of awareness-raising and communication initiatives have been carried out, including training courses for natural area managers. These actions are essential for sharing the knowledge acquired. The many communication tools produced during the project (brochures, panels, booklets, etc.) also help to make savanna conservation and the fight against invasive alien species a fundamental issue in French Guiana.

Savanna Maillard © GEPOG





PART 2

# The Group for the Study and Protection of Birds in French Guiana (Gepog)

The GEPOG, the project's local organizer, is an environmental protection association registered under France's 1901 Association Law, and founded in 1993. Its strategic objectives are to improve knowledge of biodiversity, to conserve species and habitats, to mobilize citizens for the environment, to play an active role in debate and public policy, and to support the ecological transition. The GEPOG is structured into three thematic clusters (forests, coastal plains and marine environments), within which employees implement numerous projects (European, regional, local). The association carries out numerous studies and monitoring programs on land and sea birds, as well as on large marine fauna, and works to improve knowledge of local biodiversity by involving local residents. It takes action to preserve ecological corridors (green and blue networks) and contributes to the conservation of French Guiana's savannas through the management of invasive alien species. Together with its associative partners, it manages major online naturalist databases (Faune Guyane and ObsEnMer, French Guiana Fauna and Marine Observatory in English) and plays an active role in the development of environmental education initiatives.

The association is also co-manager with the ONF of the Nouragues Nature Reserve, the second largest reserve of France, and manager of the Grand-Connétable Island Nature Reserve, the second largest marine reserve in overseas France.

Further information on the GEPOG: www.gepog.org

### **Context** of the savannas in French Guiana

The savannas of French Guiana represent a rare environment, covering just 0.22% of the territory, but one with such a wealth of species that must be preserved. In fact, they are home to 17% of French Guiana's plant species and a highly varied fauna, including 51 bird species threatened with extinction on a local scale (DGTM &CEN Guyane, 2022). Savannas are ecologically defined as plant formations, mainly herbaceous, found in tropical and subtropical zones.

In French Guiana, 11 types of savannas have been described and defined, including savannas on drained soil, flooded savannas and high shrub savannas. Located mainly on the coastal strip, they are facing strong anthropic pressure as a result of the department's economic and demographic development. Moreover, with the abandonment of certain practices, such as the regular use of fire, the forest is slowly reclaiming space.

In total, 44% of French Guiana's savanna surface area has been lost since 1950 (DGTM, CEN Guyane, 2022). Invasive exotic species such as *Acacia mangium* and niaouli, which are perfectly adapted to savanna conditions, are adding a new threat to these already fragile environments.

Savannas of the Mornes © Vincent BRIONES





Acacia mangium front in a savanna © Anna STIER/GEPOG

#### PART 4

### Acacia mangium

Acacia mangium is a fast-growing tropical tree in the Fabaceae family. Native to northern Australia and the island of New Guinea, the species was probably introduced to French Guiana during the Plan Vert (Green Plan), an agricultural and reforestation project set up in the 1970s and again in the 1990s to restore mining sites. An initial study of invasive alien species (IAS) in French Guiana ranked Acacia mangium as one of the two most problematic invasive species for French Guiana's savannas (Delnatte & Meyer, 2012). A second study provided an initial inventory of plant IAS in the region (Léotard & Chaline, 2013).

The species is present along the Maroni, on the coast from Saint-Laurent to Roura, but also inland on former mining sites and in Saül. The highest densities are found in the communes of Saint-Laurent, Sinnamary and Montsinéry, and to a lesser extent in the communes of Cayenne Island.

Acacia mangium is particularly invasive in open spaces, such as roadsides and runways, under power lines, in agricultural areas and in dry savannas. Its invasive character is expressed by the longevity of its seed bank in the soil and its ability to grow very rapidly on any type of soil.



Niaouli front in the heart of a savanna © Florent BIGNON/LPO

### PART 5

### NIAOULI (Melaleuca quinquenervia)

Niaouli, *Melaleuca quinquenervia*, is a fast-growing tropical tree in the Myrtaceae family. In French Guiana, the species was first spotted in 1948. Also native to Oceania (Australia, New Guinea, New Caledonia), its expansion was encouraged by the "Plan Vert" set up by the French State in the 1970s to develop a paper industry (Delnatte & Meyer, 2012).

Because of its invasiveness in open and wet habitats, and its ability to form monospecific stands, niaouli has been added to the list of the 100 most harmful invasive species in the world (Lowe et al., 2000). As a matter of fact, a few individuals are capable of invading a plot in just 25 years (Laroche & Ferriter, 1992). The species is sparsely distributed in French Guiana, but is highly localized and sometimes abundant in coastal savannas in the form of monospecific stands. It occurs in patches along the roads between Saint-Laurent-du-Maroni and Cayenne.

Niaouli is particularly invasive in wetlands, such as marshes, pripris ("marshes" in French Guianese Creole) and savannas. Its invasive character is expressed by its ability to modify and replace a natural ecosystem by forming monospecific forests devoid of any other plant.

### PART 6

# **IMPROVING KNOWLEDGE** about niaouli control



Control tests on adult niaoulis © GEPOG

### ACQUIRING KNOWLEDGE ABOUT THE SEED BANK

#### **Issues and objectives**

Understanding the biology and ecology of niaouli seeds is crucial both for understanding their potential to invade the savanna and for adapting management and/or control strategies. These aspects have been well studied in Florida, where the species is highly invasive, but not in French Guiana. Informations on seed production, viability, germination potential and longevity are needed to develop effective control

strategies for the species, and then to support natural area managers.

To this end, a Master II internship was carried out between April and September 2021 on the study of the species' aerial seed bank. The aims of this study were to find a method for depleting the seed bank, to acquire knowledge of the species' biology, to define the optimum periods for carrying out control operations and to gain a better understanding of the monitoring of post-control germinations.



Control tests on niaouli seeds © GEPOG

#### **Methodology - Actions implemented**

Three studies were carried out as part of this action:

- The influence of niaouli height and relative inflorescence age on seed production and germination, and characterization of the aerial seed bank.
- The influence of luminosity (shade/light) and substrate (savanna soil/forest soil) on germination rates. Seedlings were measured for 2 months. Dry and wet seasons and the transitions between them were also simulated using sprinkler systems set differently within the greenhouse.
- Determining the impact of prolonged flooding on seedling survival and the impact of fire on dormancy breakage.



Control tests on niaouli seeds © GEPOG

The data thus provided information on the most favorable felling period in order to deplete the seed bank present in the soil or resulting from post-treatment seed rain.



#### **Results - what works well**

Control tests on niaouli seeds © GEPOG

- This study is the first to be carried out in French Guiana on the ecology of niaouli. The results of the various tests are conclusive and have enabled comparisons to be made with those in Australia and Florida.
- Experimentation on germination parameters has provided previously unpublished data on the germinative capacity of the niaouli aerial seed bank in French Guiana.
- The depletion of the seed bank is accelerated when the trees and seeds are not buried, even slightly, in order to expose them to direct sunlight.
- The most favorable period for felling a population of niaoulis in the savannas of coastal French Guiana was determined by this study and corresponds to the beginning of August, before the end of the rainy season. This allows the seeds to germinate and the seedlings to die with the dry season.

#### **Difficulties encountered – Recommendations**

- A fault in the watering system led to excessive watering during the dormancy break test in dry conditions, which had an impact on the results (dormancy break favored).
- The distance between the experimental site and GEPOG's premises (65 km) meant frequent return trips to Kourou for test follow-up.
- Working in a greenhouse for the experiments was sometimes difficult and restrictive in very hot conditions.
- Sorting seeds under a binocular magnifying glass to obtain batches of 100 seeds was also tedious and time-consuming.
- Be careful to limit the number of variables/parameters to be tested, so that the results can be easily modeled in R for statistical purposes.

#### **Preliminary steps**

- 1. Derogation request: as niaouli is subject to a ministerial decree in French Guiana prohibiting its transport, possession and use (Ministerial decree of April 1, 2019), a derogation request for scientific purposes and to improve knowledge must be submitted to the prefecture. The application is made via a Cerfa form and leads to the publication of a prefectoral decree if accepted. Lead times can be short (a few days), but it is essential to consult the relevant departments beforehand, in order to anticipate the request. This approach must be taken into account in all projects involving regulated invasive alien species.
- 2. Finding the niaouli sites and collecting the seeds needed for the various tests.
- 3. Setting up the greenhouse and necessary equipment.
- 4. Drafting the various test protocols.

#### **Action cost**

Expenditure title	Unit cost (€ inc. VAT)
Equipment	
Polyester rolls for greenhouse	€60
Planting material (pots)	€66
Watering equipment (timer and sprinklers)	€70
Plastic box for germination	€1/ unit

#### **Potential partners**

Potential technical partners	Potential financial partners	Potential service providers
Research centers, nurseries	Government departments, local authorities, European Union	Nurseries, agronomy research centers (CIRAD French Agricultural Research Centre for International Development, INRAE National Research Institute for Agriculture, Food and Environment)

#### Contacts

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### TESTING METHODS TO CONTROL NIAOULI

#### **Issues and objectives**

Active control of *Melaleuca quinquenervia* requires the identification of effective control methods adapted to local conditions, to be implemented to manage the species in French Guiana. As part of the LIFE BIODIV'OM program, a protocol for testing control methods has been set up. It is based on the expertise of two researchers from Florida, who came to French Guiana in September 2019 to share their knowledge and knowhow in this field. A test of mechanical shovel felling, not initially planned in the LIFE, was also carried out.

#### **Methodology - Actions implemented**

#### **Protocol 1**

- Test of bucking/cutting short and girdling/barking combined with a chemical method using two herbicides at two different concentrations on 200 trees in November 2019.
- Four verification missions of treated trees were then carried out between December 2019 and September 2021.

All the data collected, such as leaf cover and the presence of shoots on the stumps, were analyzed and used to compare the effectiveness of the techniques tested, and thus to make management recommendations.

#### Protocol 2

Test of motorized mechanical control at the end of 2020, with the felling of 2,500 m<sup>2</sup> of niaoulis in a monospecific forest using a mechanical shovel. The felled and uprooted trees were placed in windrows on either side of the felling area. The area's continuous wetness for 2 and a half years after the works prevented the species from recovering, although the site was regularly monitored to check on the state of flooding.



Control tests on adult niaoulis © GEPOG



Control tests on adult niaoulis © GEPOG

In August 2023, a protocol was set up to test methods of managing young plants. Forty-five 1m<sup>2</sup> plots were randomly placed over the area, comprising 15 control plots, 15 plots where the niaoulis were pulled out manually and 15 plots where they were cleared with a brushcutter. Regrowth was monitored three months later.



Application of an herbicide on girdled Niaouli © GEPOG

#### **Results**

#### **Protocol 1**

- → Flush cutting, with or without herbicide application, showed 100% stump mortality after 1 year. The best method seems to be to cut the stumps as close to the ground as possible using a chainsaw. The application of phytosanitary products is not necessary, as untreated stumps have not produced any new shoots after 1 year.
- → Girdling is only effective when herbicide is applied at the concentration of the pure product. The technique alone, without herbicide, does not result in any niaouli mortality.

#### Protocol 2

- → Mechanical shoveling appears to be an effective and inexpensive method of controlling niaouli. Nevertheless, windrow management needs to be taken into consideration. It has been observed that if the trees are well uprooted and their roots removed from the ground, they die and do not regrow. However, the fact that the area was completely flooded for a long period after the work was completed means that it is impossible to draw any conclusions as to the effectiveness of this control method in dry conditions.
- → Brush-cutting and manual removal of young shoots are equally effective methods.
- → A return of herbaceous vegetation was observed 2½ years after felling. This shows that the vegetation in this wetland has the capacity to recolonize the area once the niaoulis have been removed. Unfortunately, the continuous supply of niaouli seeds from the surrounding seedbeds was also observed through an important number of young niaouli growing on the felled area.

#### What works well

- ✓ Sharing information with other structures/territories on effective control methods helps to target the methods to be tested.
- ✓ Tests of control methods on a large number of individuals offer reliable results.

#### **Difficulties encountered - Recommendations**

- High and almost permanent water levels due to the intensity of the 2020-2021 rainy season at several study sites prevented monitoring and certainly had an impact on tree mortality.
- Climate variability in French Guiana, with the El Niño and La Niña phenomena, modifies the ecological conditions that influence tree growth and therefore niaouli. It will however be necessary to repeat the protocols under different climatic conditions to ascertain the control method's efficiency and to obtain results unbiased by meteorological conditions.
- Particular attention needs to be paid to windrow management.
- All the seed trees in a watershed must be felled, otherwise there is a risk of a continuous supply of seeds, which would have a lasting negative impact on the management of young niaoulis.

Felled area for the mechanical shovel test during rainy season  $\ensuremath{\mathbb{C}}$  GEPOG



#### **Preliminary steps**

- ✓ Inventory of areas where niaouli is present.
- ✓ Two researchers from the University of Florida and the South Florida Water Management District shared their knowledge and expertise on *M. quinquenervia* control.
- ✓ Drafting niaouli control and post-treatment monitoring protocols.
- Carrying out an inventory of trees to be treated, marking and randomly assigning treatments to 200 niaouli trees.
- ✓ Finding an accessible area suitable for mechanical shovel testing.

#### **Action cost**

Expenditure title	Unit cost (€ inc. VAT)
Equipment	
Consulting mission by two experts from Florida	€5,540
Testing of control methods (protocol 1)	€2,530
Mechanical shovel felling (protocol 2)	€2,769 for 2,500 m <sup>2</sup> of land

#### **Potential partners**

Potential technical partners	Potential financial partners	Potential service providers
Research centers University Managers of natural areas	Government departments, local authorities, European Union	Landscaping companies

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# LARGE-SCALE REPLICATION OF NIAOULI CONTROL METHODS

#### **Issues and objectives**

Once the control method tests had been carried out in 2019 and 2020, it was concluded that the most effective method was to cut down the niaoulis with a chainsaw, cutting the stump as close to the ground as possible and without applying any phytosanitary products. The latter option was also chosen to avoid the use of these products in natural wetlands. The observation of high strain mortality without the application of herbicides during the first tests justified this choice of method. It was therefore replicated on larger stands at two sites with different environmental conditions.

#### **Methodology - Actions implemented**

- Crique Jacques site in Mana More than 5,000 trees were felled over an area of 1 ha in August 2022. The site is relatively accessible (close to the road), with a high density of trees.
- Passoura savanna site at the Centre Spatial Guyanais (CSG, Guiana Space Centre) in Kourou Around 500 trees were cut on 12 ha of savanna in February 2023. The site is isolated in the savanna (2hr walk from the Route de l'Espace), with a lower tree density corresponding to a small dense area on the edge of a forest grove and numerous isolated trees further out in the savanna.

Large-scale control of adult niaoulis © GEPOG





Monitoring of regrowth following control © GEPOG

Both sites were monitored with a defined protocol every 3 months for 9 months after the works, to assess the effectiveness of the method:

- Sixteen quadrats were set up on each site (8 control quadrats and 8 quadrats with the removal of stump sprouts and young shoots).
- Each quadrat was defined by a GPS point and ground markings (tape + stakes).
- During each visit, the following actions were carried out: counting stumps with and without sprouts and seedlings, taking photos and pulling out sprouts/seedlings in accordance with the protocol.

The follow-up showed that some stumps were still re-sprouting 9 months after the work at both sites. The 9-month period is too short to achieve a 100% stump mortality rate, with shoots removed every 3 months. Nevertheless, the removal of shoots significantly reduces the number of stumps that re-shoot over time, compared with the control plots. On average, more than 50% of stumps were free of re-shoots 9 months after cutting and quarterly removal.

#### Results

- ✓ Removal of shoots significantly reduced the number of stumps re-shooting over time.
- ✓ The Crique Jacques plot burned down completely a few weeks after felling, which led to a considerable reduction in the seed bank present on the felled trees.

#### **Difficulties encountered - Recommendations**

- A fire in the Passoura savanna in November 2023, prior to the last follow-up, may have had an impact on the vitality of the stumps and the number of shoots, which is difficult to include in the analyses. The fire also burned the quadrat boundaries, which also complicated the monitoring's accuracy.
- The replication of control methods has not led to the conclusion that this was an effective control method for niaouli.
- The Crique Jacques site in Mana turned out to be a niaouli-picking site for the local population, and the tests carried out were not well received. It is therefore essential that any control project should include a consultation and awareness-raising component with the communities that use them, where appropriate.

#### **Preliminary steps**

- 1. Finding suitable sites for workcamps
- 2. Checking land ownership, obtaining permits if necessary
- 3. Organizing and sizing work sites
- 4. Drawing up monitoring protocols

#### **Action cost**

Expenditure title	Unit cost (€ inc. VAT)
Felling of niaouli trees	
On a CTG plot at Crique Jacques in Mana	Fixed price of €14,157
In the Passoura savanna at the CSG (Guiana Space Center)	Fixed price of €8,980

#### **Potential partners**

Potential technical partners	Potential financial partners	Potential service providers
Research centers University Managers of natural areas	Government departments, local authorities, European Union	Landscaping companies

#### Contacts

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Isolated niaoulis in the Passoura savannah at CSG © GEPOG



# **IMPLEMENTING THE FIGHT**

against Acacia mangium



Cutting down of an Acacia mangium © GEPOG

# FEDERATING AND MOBILIZING LOCAL PLAYERS

#### **Issues and objectives**

In order to achieve the objectives of protecting the savannas, workshops were held to promote the control plan. They took place on the basis of geographical zones, as defined in the plan, and aimed to coordinate control actions in each commune wishing to take action and/or including savanna territories or protected areas. These workshops aimed to:

- Raise awareness among local players of the problem posed by the spread of Acacia mangium and its impacts
- Diagnose the invasion situation in the commune and identify priority areas for intervention
- Discuss with stakeholders to identify their needs and available resources, and organize future management and control operations collectively.

#### Methodology

- 1. Map the acacias using the most recent data available.
- 2. Identify upstream the savanna zones, the land plots and the potential stakeholders.
- **3.** Invite all potential stakeholders in the commune concerned.
- Starting the workshop with a YanAcacia role-playing session.
- 5. Gather the opinions and feelings of participants in the game.
- 6. Take stock of the distribution of acacias in the commune.
- Define the actions to be taken in terms of surveys, inventories, and active control, and identify the stakeholders who can take action in the future.



Consultation workshops for the control plan © GEPOG



YanAcacia session at Iracoubo © GEPOG



YanAcacia role-play © GEPOG

#### **Actions implemented**

Three control strategy workshops were organized during the LIFE BIODIV'OM program:

- One at Sinnamary town hall on June 9, 2021, bringing together 15 local stakeholders and land managers (town hall, PNRG/Regional Natural Park of French Guiana, DGTM/French Directorate General for Territories and the Sea, Cdl/Coastal protection agency, EDF/Electricity of France, CNES/National Center for Space Studies, SEPANGUY/Society for the Study and Protection of Nature in French Guiana) to identify the areas where each structure or stakeholder could carry out control actions and plan future interventions.
- One at the Iracoubo media library on March 21, 2022, attended by 16 local stakeholders (mayor of the commune, traditional chief of Bellevue, PNRG, EDF, ADADS/Savanna Farmers Association, farmers, DGTM, commune DGS/Director General of Services). This workshop provided information on the savannas to be prospected where acacias are present.
- And one at Montsinéry town hall on November 8, 2023, attended by 10 local stakeholders (elected officials, farmers, Chamber of Agriculture, Conservatoire du littoral/Cdl, consultancy firm). This workshop provided a basis for reflection on future actions to be carried out in the commune.

During the last two workshops, the YANAcacia role-playing game was used to raise awareness of the *Acacia mangium* problem and to gain perspective on the reality of its spread. It also enabled players to become aware of each other's roles and issues.

The game was developed by LISODE (Lien Social Et Décision/*Social Links And Decision-Making*) with assistance from PLAYTIME between 2021 and 2022, based on two participatory diagnostic workshops held in Sinnamary and Cayenne, and 11 bilateral interviews. In a second phase, the game was tested by 6 stakeholder groups. In all, more than thirty players participated in the design of this tool.

#### What works well

- The presence of a varied panel of local stakeholders (elected representatives, farmers, municipal services, EDF, natural area managers, etc.);
- The creation of small working groups to locate acacias on a map facilitates discussion and exchange. Pooling the results at the end of the workshop makes it possible to list and prioritize the actions to be carried out in the commune, and to assign them to different players depending on the areas concerned;
- The use of role-playing gives each participant the opportunity to become aware of the other players' problems and limitations. By playing the game, they can resolve any tensions that may exist between players, and create an opportunity for exchange and discussion. It also gives an overall view and a realistic idea of the cooperative efforts needed to combat *Acacia mangium*.

#### **Difficulties encountered - Recommendations**

- Difficulty in bringing all stakeholders together for an entire morning (lack of availability or involvement of certain key players).
- The use of a game as part of a participatory workshop can sometimes be perceived as a waste of time by some stakeholders. It is important to make it clear to participants beforehand that this is primarily a decision-making tool;
- Role-playing may last longer than the workshop itself.



Consultation workshop in Sinnamary © GEPOG

Expenditure title	Unit cost (€ inc. VAT)	
Equipment		
Felt pens, markers, etc.	€33	
A0 format card printing	€50	
Flip chart	€60	
Role-playing game design and production services		
Lisode	€43700	
Play time	€6000	

#### **Potential partners**

Potential technical partners	Potential financial partners	Potential service providers
Municipalities State services Natural area managers Farmers Environmental associations EDF Research centers Design offices	Government departments, local authorities European Union	Company specialized in consultation Company specialized in game creation

#### Contacts

#### GEPOG (Group for the Study and Protection of Birds in French Guiana):

- Alexandre Mathieu: <u>alexandre.mathieu@gepog.org</u>
- Marie Monrolin: <u>marie.monrolin@gepog.org</u>



#### Workshop for the control plan of Acacia mangium in Sinnamary © GEPOG

### PROSPECTING AND INVENTORYING AREAS AT STAKE

#### **Issues and objectives**

In order to plan control operations, it was necessary to update data on the presence of *Acacia mangium* in French Guiana, as the last inventory of the species dates back to 2013 and was carried out by surveying the road network (Léotard & Chaline, 2013). It was therefore essential to repeat this inventory, updating the data and supplementing it by surveying new, often difficult-to-access areas. Given the impossibility of surveying all the savannas on foot, a choice was made to focus on areas previously defined as priorities in the species control plan (e.g., savannas included in protected areas, preserved savannas). The inventory should make it possible to size and budget felling operations by determining the diameter and precise position of each tree or, in the case of overgrown areas, the surface area to be felled.



Taking the GPS point of an acacia in a savannah © GEPOG

#### Methodology

- 1. Gather GPS data from previous inventories
- 2. Gather information from managers, elected representatives and local residents in areas where acacias are known to be present
- **3.** Transfer the orthophoto of the area to be surveyed to the field tablet through Qfield, together with the relevant GIS layers (savannas, protected areas, land registry)
- 4. Ask naturalists about the best access routes to savannas when these are included
- 5. Bring binoculars, a camera, a tablet, a GPS, and either a machete or an axe
- 6. Use the map on the tablet to find your bearings
- 7. Locate trees with binoculars and find the base of their trunk
- 8. Record the GPS point of each acacia or group of trees
- **9.** Estimate the diameter of each tree to within 10 cm, count them and record this data vocally on a smartphone recorder
- **10.** Note any useful information for the felling site (presence of power or telephone lines, presence of wasp nests, access difficulties)
- **11.** For roadside surveys by car, work in pairs, drive at less than 50 km/h if possible, and travel in both directions

#### **Actions implemented**

Surveys and inventories of acacias were carried out in the coastal zone along the main roads, in certain key savannas and on Conservatoire du littoral (Cdl) land. In total, 32 savannas have been surveyed by GEPOG, covering a surface area of 6038 hectares in 7 different communes; as well as over 400 km of road, representing more than 65 days of field prospecting between 2021 and 2023.

- Savannas of Iracoubo: 4,431.5 ha surveyed between March and August 2022
- Savannas of Sinnamary: 134.7 ha surveyed in August 2023
- Savannas of Kourou: 465.4 ha surveyed in 2021
- Savannas of Macouria: 103.5 ha surveyed between December 2021 and September 2023
- Savannas of Montsinéry: 535.1 ha surveyed in July 2022
- Savannas of Matoury: 212.8 ha surveyed between March 2021 and July 2022
- Savannas of Roura: 83.4 ha surveyed in September 2021
- Eastern buffer zone between the Galion savanna and Saint-Georges along 170 km of the RN2 road in June and September 2021
- Buffer zone between Kourou and Sinnamary along 50 km of the RN1 road in August 2023
- Iracoubo buffer zone over 49 km of the RN1 road during surveys of the commune's savannas
- Western buffer zone at Mana and Awala-Yalimapo along 100 km of the RN1, D8 and D22 roads between September 2021 and October 2023

Canoe field survey in the pripris maillard  $\, \mathbb{O} \, \, \mathrm{GEPOG} \,$ 





Field inventory in the Anton savanna in Iracoubo © GEPOG

#### What works well

- The use of a field tablet with useful layers on Qfield greatly simplifies acacia inventory missions:
  - Tree positions and other information can be entered directly on site in the attribute table of the GIS layer on the tablet.
  - A recent orthophotography background allows you to optimize savanna prospecting by avoiding or bypassing impassable or flooded areas.
  - A tablet with integrated GPS provides real-time location information, facilitating access to the savannas through the forest.
- Voice recording of tree location and diameter data on a smartphone is quicker and less time-consuming than on paper, especially in wet weather.
- As Acacia mangium is a very distinctive species, the use of binoculars in the savanna not only helps to detect isolated trees, but also to confirm the absence of the species in large areas, thus considerably reducing the time required for surveys on foot.
- During surveys in the savannas of Iracoubo, the uprooting of seedlings and the debarking of very isolated trees in the savannas reduced the surface area and duration of work sites.
- Whatever the environment and the distance to be covered, taking the GPS position manually at the foot of the trees guarantees the feasibility of future chainsaw felling.
- Having two people to carry out inventories, particularly along roads, with one person taking notes and another driving, each prospecting one side of the road. On foot, being accompanied also enables tasks to be shared (GPS, recording, counting, etc.).
- The presence of Acacia mangium is systematically associated with a past or present anthropogenic activity or infrastructure (runway, road, field, dwelling, mine, power line, etc.), which reduces the surface area of natural areas to be surveyed. Similarly, young acacias are almost always associated with a nearby seed-bearing acacia, visible through binoculars.

#### **Difficulties encountered - Recommendations**

- \* The state of the tracks in the rainy season means that certain areas and savannas can only be accessed in the dry season. It is therefore necessary to plan the timing of inventories and work sites well in advance. The inventory of the Mornes savanna islets in Macouria could only be carried out by canoe at the height of the rainy season.
- Plan to carry out a complementary inventory if data is missing or areas were overlooked during the previous survey or are inaccessible at certain times of the year.
- Acacia mangium trees often harbor ants and wasp nests, which have stung both the technical team and contractors. Noting this information beforehand during inventories enables the site contractor to gear up accordingly.

#### **Action cost**

Expenditure title	Unit cost (€ inc. VAT)
Equipment	
GPS	€660
Tablet	€567
Pair of binoculars	€263
Machete	€15
Axe	€53

#### **Potential partners**

Potential technical partners	Potential financial partners	Potential service providers
Cdl (Coastal protection agency) Nature reserves ONF (French National Forests Office) CEN (Conservatory of Natural Areas) Elected representatives and traditional chiefs DGTM (French Directorate General for Territories and the Sea) road department Residents	Government departments, local authorities, European Union	Botanists Biotope

#### Contacts

GEPOG (Group for the Study and Protection of Birds in French Guiana):

- Alexandre Mathieu: <u>alexandre.mathieu@gepog.org</u>
- Marie Monrolin: <u>marie.monrolin@gepog.org</u>

### IMPLEMENTING AND MONITORING ACACIA MANGIUM CONTROL PROJECTS

sheet

#### **Issues and objectives**

The Life BIODIV'OM project had several concrete objectives for the fight against *Acacia mangium*, in particular:

- 100% of French Guiana's coastal protected natural areas free of Acacia mangium, in particular Conservatoire du littoral (Cdl) sites with savannas;
- 50 to 70% of French Guiana's savannas free of Acacia mangium;
- Eradicate the species from communal land in several communes (Sinnamary, Kourou, Montsinéry-Tonnégrande).
- Establish several buffer zones to limit the spread of the species and protect remarkable savannas; notably those around the Guiana Space Center, which account for 40% of the total surface area of savannas in French Guiana. These buffer zones are located between Mana / Awala-Yalimapo and Iracoubo as well as between Kourou and Sinnamary and between the Galion and Saint-Georges savannas. The latter part of the territory is little invaded, limiting the species' spread to 1/3 of the coastline.

The control operations carried out over the last three years of the project have achieved almost all these objectives, or come as close as possible. During control operations, mature trees are cut down to ground level. This method was identified in the Life+ CAP DOM program as the quickest and least costly.

Young sprouts of Acacia mangium on a felling site in Iracoubo © GEPOG



#### Methodology

- 1. Following the surveys and inventories, map the site, including GPS positions of trees, GIS layers of savannas, protected natural areas, land registry and other relevant data.
- 2. Summarize in a table the number of young acacias to be uprooted and the number of mature acacias by diameter.
- **3.** If acacias are located on private plots, request access to cadastral information on the plot in order to find the owner and obtain their agreement.
- 4. Draw up the specifications and issue the call for tenders.
- 5. Provide the pruning contractor with GPS points before the worksite visit to draw up the estimate.

The specifications for the felling sites set up under LIFE are precise and unique for each site. They must include a map of the acacias, a table summarizing the number of trees per diameter class, recommendations on access and any problems that may arise during the work. If the plots belong to private owners, the service providers are informed.

Acacia mangium control at the CSG (Guiana Space Centre) © GEPOG



From 2021 to 2024, two types of felling works were carried out on the French Guiana coast, in savannas (on Conservatoire du littoral land in particular) and along roadsides (buffer zones):

- Awala buffer zone (43 km): more than 170 acacias felled by GEPOG and local residents between September 2022 and March 2024;
- South Mana buffer zone (33 km): 5 acacias felled by the GEPOG team between Prospérité and Saut Sabbat along the RN1 road in August 2023;
- Organabo buffer zone in Mana (24 km): over 300 acacias felled by a contractor between Carrefour de Mana and Organabo, and at private homes in February 2024;
- Iracoubo buffer zone (49 km): 8 acacias felled by the GEPOG team along the RN1 road near the Organabo, Flèche, Moucaya and Trou-Poissons savannas during inventories in 2022 and 2023;
- Kourou-Sinnamary buffer zone (50 km): over 1,000 acacias felled by a contractor along the RN1 road and in the former Mont Vénus quarry, in the Change and Compagnons savannas in January 2024;
- Eastern buffer zone between Galion and Saint-Georges (170 km): over 550 acacias felled by GEPOG, the Régina MFR (Rural Family Home) and a contractor along the RN2 road, and in 3 private landowners' property between 2021 and 2023;
- Iracoubo savannas: over 274 acacias felled by a service provider in the Roches blanches, Morpio, Éloge and Mathieu savannas in April 2023 and 12 by the GEPOG team in the Yanou and Fiévée savannas in October 2023;
- Savane des Pères (Cdl) in Kourou: 3 acacias felled by GEPOG and 2 by PNRG between 2021 and 2023
- Wayabo savanna (Cdl) in Kourou: 133 acacias felled by a contractor in March 2022
- Savane des Mornes (Cdl) in Macouria: over 1,300 acacias felled by contractors between July 2023 and February 2024
- Savane Maillard (Cdl) in Macouria: more than 650 acacias felled by a contractor in July 2022 and between November 2023 and February 2024
- Pripris de Yiyi (Cdl) in Sinnamary: more than 800 acacias felled by a contractor in April 2022



Acacia mangium control © GEPOG

In all, more than 5,500 acacias were felled and more than 8,000 plants uprooted, along more than 369 km of national and departmental roads and on 3,519.6 ha of savanna with or without protected status.

#### Monitoring and evaluation

Post-construction monitoring is carried out 6 and 12 months after felling, then once a year. These monitoring operations are relatively time-consuming and require us to return to each GPS point. Acacias that have sprouted are uprooted, and any trees that may have slipped through the felling phase are cut down. Only about ten stumps out of all the work sites have grown shoots – because they were cut too high.

Annual monitoring is preferred, but biannual monitoring would be possible, as fruiting of *Acacia mangium* in French Guiana does not occur until the tree is 2 years old. In the long term, ongoing monitoring is essential to ensure that *Acacia mangium* does not reappear on felling sites. Measures to monitor the return of local flora and fauna can be put in place, as well as the development of a monitoring network to prevent the invasion of *Acacia mangium* on sites still free of it.



Pulling out an Acacia mangium during a monitoring mission © GEPOG

#### What works well

- Drawing up an exhaustive table summarizing the number of trees by diameter class (< 5 cm, 5 cm, 10 cm, 20 cm, etc).</li>
- Grouping the site visit for drawing up estimates into a single day with all interested service providers.
- Providing the pruning contractor with GPS points / ensuring the contractor knows how to use and has in their possession a GPS or the Qfield application on their smartphone during the work.
- Providing as much information as possible in the specifications; e.g., location, number of acacias to be felled, location of each tree, special conditions (beehives, wasps, nearby dwellings, etc.).
- If the project is too large or too extensive, grouping the areas into several lots and requesting a quotation for each lot, which means that you can potentially have several jobs at the same time.
- Raising awareness among landowners to encourage them to self-manage the uprooting and cutting of acacias.
- Being available to check on the progress of the work at the beginning and end, and checking that no trees have been spared; and if so, quickly informing the service provider.

#### **Difficulties encountered - Recommendations:**

- Depending on the size of an acacia grove, exhaustive tree counts quickly turn into a complex endeavor. However, entering a single GPS point can be misleading, leading to an underestimate of the number of trees in a site. That is why, if you do decide to enter a single point, you should also record the number of trees and their approximate diameters, to properly assess the job's cost down the road.
- As Acacia mangium wood is particularly hard, especially that of older trees, combined with the heat and humidity of the savanna, you can definitely expect the clamping and consequent loss of one or more chainsaws during felling operations.
- The search for certain owners with acacias on their land proved complex in several situations (owner not resident in French Guiana, long lease not filled in, invalid postal address in the land register, etc.).
- As large acacias often host wasp nests in the savanna, it was necessary to plan escape routes, carry insecticide spray and have antihistamines at the ready at all times.
- The period between the first inventories and the completion of the work sites averages 6 months for the savannas and 12 months for the buffer zones. It may therefore be necessary to update the inventory before sending out the specifications.
- Be careful to keep the cutting height to less than 5 cm from the ground to limit the probability of reshoots – and thus to avoid having to return to the stumps cut too high. Trees that cannot be cut can be girdled 40 cm from the base of the tree.
- To avoid dispersing the seeds outside the work area, all equipment (chainsaws, clothing, footwear, personal protective equipment, etc.) must be thoroughly cleaned on site.



Acacia mangium seeds © GEPOG

#### **Preliminary steps**

- 1. Carrying out inventories in the savannas
- 2. Training everyone working on the site in felling, girdling and uprooting techniques.
- 3. Finding out about the owners of the plots in order to obtain their authorization for felling.
- 4. If felling is to take place on a roadside, contacting the relevant Centres d'Entretien et d'Interventions (Maintenance and Service Centers, departments of the local DGTM, French Directorate General for Territories and the Sea) to obtain an application form for work on the national road network.

#### **Action cost**

Expenditure title	Unit cost (€ inc. VAT)
Equipment	
Pole-mounted pruning saw	€1150
Pole-mounted pruning saw	€615
Chainsaw	€790
Helmet	€60
Cut-resistant pants	€100
Safety boots	€98
Acacia mangium felling service	
Savannas of Iracoubo	€10,230 (€37/tree, €17/ha)
Wayabo savanna (Cdl)	€1,600 (€12/tree, €22.5/ha)
Mornes and Maillard savannas	€25,003 (€13/tree, €242/ha)
Eastern buffer zone	€4,220 (€105/tree, €25/km)
Kourou-Sinnamary buffer zone	€13,047 (€13/tree, €261/km)
Mana buffer zone	€4,190 (€14/tree, €175/km)
Pripris de Yiyi (Cdl)	€2,250 (€2.8/tree, €281/ha)

#### **Potential partners**

Potential technical partners	Potential financial partners	Potential service providers
Managers of natural areas State services (Road) EDF	Government departments, local authorities, European Union	Pruning companies

#### **Contact:**

GEPOG (Group for the Study and Protection of Birds in French Guiana):

- Alexandre Mathieu: <u>alexandre.mathieu@gepog.org</u>
- Marie Monrolin: <u>marie.monrolin@gepog.org</u>

# RAISING AWARENESS, TRAINING AND TRANSMITTING acquired knowledge and skills



Field training for the "agriculture career" students (CAP) in the MFR of Régina  $\ensuremath{\mathbb{C}}$  GEPOG

### COMMUNICATING, RAISING AWARENESS AND TRAINING LOCAL USERS AND STAKEHOLDERS

#### **Issues and objectives**

To ensure that as many people as possible are aware of the biodiversity in the French Overseas Territories, LIFE projects provide for the deployment of a large number of tools aimed at both general communication about the project (LIFE website, newsletters, Facebook page, press kit, traveling exhibition, etc.) and tools specific to each of the territories. In French Guiana, numerous tools have been developed to raise awareness among the general public, schoolchildren, academics and elected representatives of the need to protect French Guiana's savannas and the impact of invasive alien plant species. Specific training courses have also been organized for strategic stakeholders in French Guiana.

#### **Actions implemented**

- Raising public and landowner awareness
  - The general public and schoolchildren

During the course of the project, the general public was made aware of the need to protect savannas and combat invasive alien species through national events (e.g., Fête de la science *Science Festival*, Fête de la nature *Nature Festival*, Journée des zones humides *Wetlands Day*, etc.) and local events (Alternayana festival, GEPOG evenings, etc.).

Another tool created as part of the previous LIFE project (Life + CAPDOM) is the "chemin des savanes" (Savanna Path), an itinerant audio trail through the savannas. Numerous outings have been organized around this trail each year, raising awareness of the project's new key themes, particularly the fight against *Acacia mangium* and niaouli.

Tour of the savana path © Vincent Prémel





Visit of the savannas in the CSG with a nearby school © GEPOG

Over the course of the project, the recruitment of an environmental and sustainable development education officer has led to an increase in classroom activities. Some fifteen classroom activities were organized for primary and secondary school pupils, introducing them to the savannas, their fauna and flora, and how they function.

At higher levels, a number of presentations at universities discussed the management and conservation of natural areas, and used the example of the many approaches put in place in this LIFE to support the arguments. In addition, a number of workshops were held with BTS GPN (Senior Technologist's Certificate in Management and Protection of Nature) students from the Lycée Matiti and with young people from the Régina MFR (Rural Family Home) to enable them to set up concrete actions to combat acacias in the eastern buffer zone.



Fieldwork with the MFR of Régina© GEPOG

#### The owners

Several felling operations took place on private plots. Access to cadastral data enabled us to identify their owners. Most of them were looking for solutions to manage the acacias on their land, and all agreed to have their acacias felled. These meetings provided an opportunity to discuss with the owners, to provide them with control techniques and to realize the rather negative view they themselves have of the species.



Discussions with private landowners © GEPOG



Training technical staff in Rémire-Montjoly © GEPOG

#### Training technical agents and managers of natural areas

Several training sessions on the management of *Acacia mangium* have been organized for technical agents and managers of natural areas. The aim of these training sessions is to provide keys for identifying the different species of acacia in French Guiana, to give technical information on the different control methods (cutting, uprooting, etc.) and to highlight safety precautions to be observed during felling and pruning operations. Training includes both classroom and field

sessions, with demonstrations of control techniques.

#### Several training courses have been given to:

- Pruning company operating on behalf of EDF (October 2021)
- Rémire-Montjoly municipal green space maintenance workers (September 2021)
- CNES (National Center for Space Studies) biodiversity managers at the CSG (Guiana Space Center) (July 2023)



Training of technical staff © GEPOG

Companies selected for the felling work (4 companies, over twenty pruners)

#### > Creating and deploying awareness and communication tools

#### The website: https://www.savanes.fr

The website was created in 2013 to inform the public about the operations carried out and the scientific work produced as part of the savanna/EEE (IAS) component of the Life+ Cap DOM and LIFE BIODIV'OM projects. It presents the savannas and some of the species that can be found there, as well as the actions carried out as part of LIFE BIODIV'OM ("News" section). A "Médiathèque" (Media Library) area contains all the documents produced (reports, brochures, booklets, scientific studies, audio trail of the Chemin des Savanes).



Savanes.fr website

#### Awareness-raising leaflets on invasive alien species in the savannas

Two awareness-raising leaflets in A4 format (3 panels, double-sided) were designed, printed (250 copies of each) and distributed to present the two target invasive alien species and define the associated issues for the savannas of French Guiana:

- Acacia mangium, the savanna invader
- Niaouli, the gateway to the savannas

These materials were distributed at training courses, school events, public events, consultation workshops, monitoring committee meetings and to acacia owners.



Inside of the Acacia mangium leaflet

#### Social networks

The @GEPOG Facebook page also serves as a relay for news posted on the **savanes.fr** website and on the **lifebiodivom.fr** project website. It is also an important information channel for sharing events with the general public and, more generally, for sharing information about the savannas to shed a light on this environment and the various pressures that weigh on it. In 2023, it is followed by 3,500 people. The GEPOG Facebook page is also used to share the videos created as part of the project (1 per year), which also serve as awareness-raising tools.

#### Traveling exhibition

Kakemonos presenting the various LIFE BIODIV'OM programs in the 5 French ORs (Outermost Regions) to raise awareness of the project's themes and challenges have been displayed in several public places: in the halls of the Sinnamary and Rémire-Montjoly town halls, at festivals and cultural events (Fête de la Science *Science Festival*, etc.), in the Cultura store, and in the departure lounge at Cayenne airport during the summer vacations in 2022.





Two panels installed on the CSG (Guiana Space Center) © GEPOG

#### Information and awareness panels

Six information and awareness-raising panels presenting the savanna ecosystem on the one hand, and *Acacia mangium* and GEPOG's actions in this habitat on the other, were installed in 2022 at the Maison de la Nature (House of Nature) in Sinnamary, in a savanna at the Matiti agricultural lycée in Macouria and on the Golf trail in Kourou (CSG).

#### Our press releases

Nearly 15 articles or radio programs were broadcast on departmental and national press channels to talk about the project, savanna conservation and the fight against invasive alien species. For example, articles appeared in the magazine Boukan (revue des outre-mer *Overseas review* magazine), on Guyane la 1ère (French Guiana TV Channel) and in Le courrier de la Nature (*The Nature Courier* newspaper).



Double-page spread on savannas in Oiseau Mag magazine

The magazine published by the LPO "L'oiseau magazine junior" also devoted a special issue to the Life BIODIV'OM project, with a section dedicated to the savannas and the fight against IAS, to reach a younger audience. A total of 900 copies of this special issue were printed and distributed to schools and at various events for the general public.

#### Awareness-raising videos

Three videos created as part of the project focus on the savannas of French Guiana, including one created in partnership with the members of "Dans les forêts de Guyane" (In the Forests of French Guiana), a trio of wildlife and photography enthusiasts living in French Guiana. This video has been viewed over 3,800 times on Youtube.

#### Dissemination of control strategies and plans

The Plan de lutte contre l'Acacia mangium (Control Plan for Acacia mangium) and the Stratégie de lutte contre le Niaouli en Guyane (Control Strategy for Niaouli in French Guiana) were disseminated by press release, via articles on the savanes.fr website and on the lifebiodivom.fr as well website, as in the International Union for Conservation of Nature (IUCN) Resource Center newsletter (n°21 of May/June 2022). Printed versions were also distributed to town councils and executive and financial partners, with a total of 17 copies of each document given out.



#### What works well

- ✓ Video formats on social networks
- Relay by local structures
- ✓ Animations and excursions in savannas for the general public and schoolchildren

#### **Recommendations – Problems encountered**

- Make content as accessible as possible so that it can be understood by all potential users
- \* Anticipate communication needs and assign a dedicated person to this task
- Do not hesitate to write press releases and send them regularly to the media, whether to highlight past actions or to announce the organization of an event
- Remember to take regular photos/videos in the field to feed all communication channels

#### **Preliminary steps**

- ✓ Identify target audiences in the area
- ✓ Draft content
- ✓ Contact possible partners (schools, state services, ...) to organize the different activities and trainings.

#### **Action cost**

Expenditure title	Minimum unit cost (€ inc. VAT)	Notes
LIFE BIODIV'OM website	€4630.5	Allow an additional €500 per year for maintenance
Savanna leaflets	€307	500 copies printed
Savanna video	€4500	5-minute video (filming + editing)
Savanna panels	€5147	Panel graphic design Panel printing

#### Potential partners and technical service providers

Potential technical partners	Potential financial partners	Potential service providers
Primary and secondary schools, local authorities, municipalities natural area managers, environmental associations	Government departments, local authorities, European Union	Graphic designer Illustrator Video maker Printer

#### Visit of the savannas in the CSG with a nearby school © GEPOG



# PASSING ON ACQUIRED KNOWLEDGE AND SKILLS

#### **Issues and objectives**

In order to be able to pass on and replicate the knowledge and skills acquired during the project, a number of actions are being carried out aimed at target audiences or structures in areas with similar problems and which could benefit from these exchanges.

In this context, GEPOG has taken part in external symposia to promote the project's results and organize a replicability mission.

#### **Events organized**

Workshop on Invasive Alien Species – French West Indies

Taking perceptions into account in Acacia mangium and niaouli management Date: February 10 - 13, 2020 Location: Fort-de-France, Martinique Exchange time: 4 days Type: Workshop Number of participants: Over 80 To learn more



IUCN IAS Workshop © GEPOG

#### Webconference

Des Savanes et des Hommes – L'ambivalence de l'acceptation sociale (Of Savannas and Men – The Ambivalence of Social Acceptance) Date: February 27, 2020 Location: Paul Sabatier University, Toulouse Exchange time: 2h Type: Webconference Number of participants: 12

#### Conference

Savanes de Guyane – Entre nature et culture (French Guiana's Savannas – Between Nature and Culture) Date: April 20, 2023 Location: Matiti EPLEFPA (Public Establishment for Agricultural Education and Vocational Training), Macouria, French Guiana Exchange time: 1h30 Type: Conference



Inter-OR replicability mission

Inter OR Replicability mission in French Guyana © Vincent Prémel

#### Acacia mangium management in French Guiana, Mayotte and the Comoros

Date: September 15 - 16, 2022 Location: Cayenne, French Guiana Exchange time: 2 days Type: International meeting Number of participants: 7

Actions: Indoor and savanna exchanges on the management and problems of *Acacia mangium* in French Guiana (GEPOG), Mayotte (Mayotte Departmental Council) and the Comoros (Mohéli National Park).

#### <u>1<sup>st</sup> LIFE BIODIV'OM technical seminar</u> – <u>The fight against invasive alien species</u>

Acacia mangium and niaouli at the gateway to the savannas – Testing methods and implementing a control plan Date: November 15 - 17, 2021 Location: Maison du Parc National de La Réunion (Réunion National Park House), Plaine des Palmistes, Réunion Type: Technical seminar Number of participants: Over 30 Actions: Presentation of control method tests



IAS control seminar on Réunion Island © IMAGIRUN

#### 2<sup>nd</sup> LIFE BIODIV'OM technical seminar – Participatory approaches to promote biodiversity

Consultation: an essential tool in the management of Acacia mangium and niaouli Date: September 19 - 22, 2022 Location: Cayenne, French Guiana Exchange time: 3 days, in the classroom and in the field Type: Technical seminar Number of participants: over 80

# <u>Final closing seminar of the LIFE</u> <u>BIODIV'OM project</u>

Controlling Acacia mangium in French Guiana and Knowledge acquired on niaouli Melaleuca quiquenervia in French Guiana

Date: February 7 - 9, 2024

*Location*: Maison du Parc National de La Réunion (Réunion National Park House), Plaine des Palmistes, Réunion

Exchange time: 3 days, in the classroom and in the field

*Type*: Seminar *Number of participants*: over 50 on site and 70 remote



LIFE Seminar in French Guiana © GEPOG



Final LIFE seminar in Réunion © Colors Island Production

LIFE seminar in French Guiana – Vincent Prémel





EMAPI 2023 external seminar © EMAPI

• <u>16<sup>th</sup> International Conference on Ecology and Management of Alien Plant Invasions (EMAPI 2023)</u>

Ten years of Acacia mangium control in French Guiana: From awareness to engagement of stakeholders Date: October 23-27, 2023 Location: Pucón, Chile. Exchange time: 4 days, in the classroom and in the field Type: International scientific conference Number of participants: over 150

#### <u>"Forest cosmopolitics" seminar at Royère de Vassivière</u>

Presentation of the management of invasive niaoulis and acacias and the conservation of French Guiana savannas Date: January 21, 2024 Location: Royère de Vassivière, FRANCE. Type: Training Number of participants: 12

Savana of Trou-Poissons (fish hole), Iracoubo © GEPOG



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Sunrise in the father's savanna, Kourou © GEPOG





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