

# Rapid Bushfire Response for Emergency Response

## Summary

How to respond and deal with fires in time when they occur is a question worth thinking about. This paper provides a fire response plan for Victoria through the rational deployment of EOC, drones and forward teams.

In Task 1, the paper establishes the area safety evaluation model with fire frequency, size, and recent fire situation as indicators to classify the danger levels of different areas in Victoria. Then, we confirm that drones should provide different services for high-risk and dangerous areas. In order to increase the service capacity, we optimize both capacity and cost. For capability, we make the average response time of SSA drones to high-risk areas as short as possible, and reserve as many SSA drones to dangerous areas as possible. For cost, we quantify the demand for SSA drones in terms of fire acreage, and take into account the rounds and the attrition rate of drones. We also consider the mix between SSA drones and radio repeater drones, and calculate the number of repeater drones using a greedy mix-based maximum number solving algorithm. The total cost is calculated and finally the quantity optimization model based on the maximum mix rate and minimum cost is obtained. **200 SSA drones and 32 radio repeater drones are needed, respectively.**

**Keywords:** safety factor   commensurable   signal-to-noise ratio

# Contents

<b>1</b>	<b>Introduction</b>	<b>3</b>
1.1	Problem Background . . . . .	3
1.2	Restatement of the Problem . . . . .	3
1.3	Our Work . . . . .	3
<b>2</b>	<b>Assumptions and Notations</b>	<b>3</b>
2.1	Assumptions . . . . .	3
2.2	Notations . . . . .	3
<b>3</b>	<b>Model I: XXXXXX</b>	<b>3</b>
3.1	Factors/Development of the model . . . . .	4
3.1.1	More Sub-details I . . . . .	4
3.1.2	More Sub-details II . . . . .	4
3.2	Factors/Development of the model . . . . .	4
3.3	Factors/Development of the model . . . . .	4
<b>4</b>	<b>Model II: XXXXXX</b>	<b>4</b>
4.1	Factors/Development of the model . . . . .	4
4.1.1	More Sub-details I . . . . .	4
4.1.2	More Sub-details II . . . . .	4
4.2	Factors/Development of the model . . . . .	4
4.3	Factors/Development of the model . . . . .	4
<b>5</b>	<b>Application of Models</b>	<b>4</b>
<b>6</b>	<b>Sensitivity Analysis</b>	<b>4</b>
<b>7</b>	<b>Model Evaluation and Further Discussion</b>	<b>5</b>
7.1	Strengths . . . . .	5
7.2	Weakness . . . . .	5

7.3 Further Discussion . . . . .	5
<b>8 Newspaper Artical/Flyer/Magazine</b>	<b>5</b>
<b>Appendices</b>	<b>7</b>
<b>Appendix A First appendix</b>	<b>7</b>

# 1 Introduction

## 1.1 Problem Background

PROBLEM BACKGROUND

## 1.2 Restatement of the Problem

RESTATEMENT

## 1.3 Our Work

ONE FIGURE AND SOME DISCRIPTION.

# 2 Assumptions and Notations

## 2.1 Assumptions

- 
- 
- 
- 

## 2.2 Notations

Symbol	Description
$C$	Competition matirx of species
$L$	Niche width od specise
$\Gamma$	Species sensitivity to drought
$l_i(t)$	Niche width of the i-th species at time t
$b_i(t)$	Increase in niche width of
$d_i(t)$	fraction of niche width of the i-thh
$\sigma_i(t)$	Gaussian white noise for unpredictability
$K(t)$	Niche width of a community at time t

# 3 Model I: XXXXXX

PRE-DISCRPTION OF THE MODEL. SOME FIGURES AS WELL.

### **3.1 Factors/Development of the model**

BALABALA

#### **3.1.1 More Sub-details I**

BALABALA

#### **3.1.2 More Sub-details II**

BALABALA

### **3.2 Factors/Development of the model**

BALABALA

### **3.3 Factors/Development of the model**

BALABALA

## **4 Model II: XXXXXX**

PRE-DISCRPTION OF THE MODEL. SOME FIGURES AS WELL.

### **4.1 Factors/Development of the model**

BALABALA

#### **4.1.1 More Sub-details I**

BALABALA

#### **4.1.2 More Sub-details II**

BALABALA

### **4.2 Factors/Development of the model**

BALABALA

### **4.3 Factors/Development of the model**

BALABALA

## **5 Application of Models**

CHOOSE CERTAIN REGION TO UTILIZE THE MODELS ABOVE.

## **6 Sensitivity Analysis**

NECESSARY SENSITIVITY ANALYSIS HERE.

## 7 Model Evaluation and Further Discussion

### 7.1 Strengths

- 
- 
- 
- 

### 7.2 Weakness

- 
- 

### 7.3 Further Discussion

- 
- 

## 8 Newspaper Artical/Flyer/Magazine

BALABALA

## References

- [1]
- [2]
- [3]
- [4]
- [5]
- [6]
- [7]
- [8]
- [9]
- [10]
- [11]
- [12]
- [13]

# Appendices

## Appendix A First appendix

---

CODE1

2

3

4

5

---