



VERSION 2.0  
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## Group 2 Project Plan

GROUP MEMBERS:	Bindu van Raak	(611629)
	Justin Mulder	(563558)
	Assem Abdellaoui	(566456)
	Justice Pandt	(580014)
	Joud Benjamin	(617059)



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## 1. INTRODUCTION

The purpose of this document is to provide a definition of the project, including this project's goals and objectives. Additionally, this plan will serve as a contract between the group members.

The Project Plan defines the following:

- Context of the situation
- Project goals and objectives
- Methodology of the project
- Risks and solutions
- Task division and planning

Chapter 2 will describe the context of the situation. There the needs of the client will be specified, and the problem statement will be stated. In chapter 3 the goals of the project will be outlined, describing the main objectives of the project. Also, the main research question and sub questions will be defined. In chapter 4 the methodology of the project will be explained. Here the research design and strategy will be further described. In chapter 5 the risks and solutions will be assessed. Lastly the contact information of the group members and the instructors will be listed.

## 2. CONTEXT

The Oostvaardersplassen is a closed nature reserve in the Netherlands. The area is home to many kinds of animals, the most prominent of which being large mammals. These large herbivores are supposed to have occurred in the Netherlands in the past and have helped shape the landscape. The general idea behind this nature reserve is to have the animals live as naturally as possible; for example, carcasses of dead animals will remain, and the animals are not fed in case of food shortages. However, this policy has led to animals starving and people seeing dead or suffering animals from the side of the road or train and feeling sorry for them. On the other hand, the general public protest when animals are shot to reduce the population and the strain on natural resources. There is no easy solution to this as every choice has its consequences.

### 2.1 SITUATION IN THE ORGANISATION

Staatsbosbeheer, the organization owning the Oostvaardersplassen nature reserve, has asked Inholland University of Applied Sciences to develop an application which can predict the possible population given certain circumstances and thus give the best ethically acceptable solution to the problem. By building multiple mathematical models of real-life situations in order to make predictions, the application will be able to offer multiple options and conditions to calculate different theoretical solutions.

### 2.2 PROBLEM STATEMENT

In the Oostvaardersplassen nature reserve, three kinds of large herbivores are present: wild horses, wild cattle, and deer. Other major species are geese and birds of prey. As one can surmise from this, there are no major predators present. The ecological system in this nature reserve has been unbalanced from the beginning, partly due to the absence of a top predator and also due to the closed nature of the preserve, meaning the herbivores cannot migrate to new lands in search of food. This has caused overpopulation of these animals and this has led to animals starving, and the general public being very unhappy about this.

### 3. GOALS OF THE PROJECT

#### 3.1 OBJECTIVES

The objective of this project is to create an application which implements the necessary mathematical models which calculate the effects of certain conditions on the current situation and thus showing the best possible solution to the described problem.

#### 3.2 MAIN RESEARCH QUESTION AND SUB QUESTIONS

##### MAIN RESEARCH QUESTION

What is the best ethically acceptable measure which can be taken to improve the ecological balance in the Oostvaardersplassen?

##### SUB QUESTIONS

The sub questions are as follows:

1. *What are the needs of the client?*
2. *What mathematical models are already available?*
3. *What variables should be taken into consideration when creating mathematical models?*
4. *Which models are simple enough to use with the data acquired?*
5. *How can the results of the models be displayed in an application?*

## 4. METHODOLOGY

### 4.1 RESEARCH STRATEGY

To finish this project, and approach will be taken that is more directed on a literature study. Most things which are needed to complete this project will be found in primary or secondary literature. However, there will be some descriptive research and some experiments undergone to help answer some of the sub questions. The depth of the research will be exploratory since it is setting out to discover the right solution to the described problem.

### 4.2 RESEARCH DESIGN

In this section, we will go over each sub question and how we will answer them.

1. *What are the needs of the client?*

To answer this question, first a literature study will be carried out which focuses highly on the lessons of software engineering. During these lessons, the group will learn how to find the needs of a client and this knowledge will then be used to answer this question by means of a descriptive study. This will be qualitative research, as there will not be any numbers derived from it.

2. *What mathematical models are already available?*

This question will be answered by means of a literature study will be carried out on the provided books and previous projects. This will provide the group with the knowledge that previous project groups and/or researchers have already acquired which will in turn provide an answer to this question. This research will be quantitative as the existing mathematical models will merely be defined.

3. *What variables should be taken into consideration when creating mathematical models?*

To answer this question, a literature study will be carried out on the previously collected data. Then the models will have to be studied to understand which variables are to be used.

4. *Which models are simple enough to use with the data acquired?*

To discover how the models can be simplified, a literature study will be carried out on the models already acquired, along with some experiments to define what or how the models can be simplified. This research will be qualitative.

5. *How can the results of the models be displayed in an application?*

To find out how the results can be displayed in an application a qualitative literature study will be carried out on the previous classes of Object Oriented Programming and the current classes of UML. This will define what is possible to do in the time of this project. Some exploratory research will also be carried out to find out the best and most effective way of displaying the results of the models in the application.

## 5. TASK DIVISION AND PLANNING

### TASK DISTRIBUTION

This paragraph will show the task distribution over the weeks of the project. Group members will refer to this when completing their assigned work.

### PLANNING

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WEEK	DATE	COMPLETED	BY
1	15-11	GitHub repository set up and working	Justice
	17-11	Draft project plan completed	Bindu
	18-11	Possible challenges of project and their solutions defined	Everyone
	19-11	Presentation on challenges and approach to project created	Everyone
2	20-11	Final project plan completed	Everyone
	22-11	Data and literature collected	Joud & Assem
	24-11	First basic mathematical models researched	Justice, Justin & Bindu
	25-11	First report structure set up	Bindu
3	28-11	First mathematical models created	Assem and Justin
	30-11	Basic code for application created	Bindu
4	5-12	Needs of the client specified	Everyone
	6-12	Variables to be used defined	Joud and Assem
	9-12	Feature list prioritised	Client
5	12-12	Basic logistics model complete including carrying capacity	Joud, Justin and Assem
	13-12	First and second model implemented in a graph	Bindu
	15-12	Use case descriptions complete	Justice

WEEK	DATE	COMPLETED	BY
6	17-12	Handing in first models	Joud, Justin and Assem
	20-12	Documentation started	Bindu
	20-12	Domain model complete	Justice
7	07-01	Handing in draft report	Everyone
	11-01	Class diagram completed	Justice
	12-01	Final touches on report and application	Bindu
	13-01	Documentation complete	Everyone
8	14-01	Handing in final report	Everyone
	15-01	Presentation started	Everyone
	20-01	Presentation complete	Everyone
	21-01	Handing in project files	Everyone
9	22-01	Presenting project to group	Everyone
	28-01	Report, product and documentation re-submitted if needed.	Everyone



## 6. RISKS AND ISSUES MANAGEMENT

In the following paragraph the internal and external risks of the project will be stated. For each risk a value will be given to the probability of this risk occurring and the impact this risk will have on the project. These values range from 1 to 6. 1 being the lowest value and 6 being the highest. Also, the priority will be stated. This value is a multiplication of the probability and the impact and shows how important this risk is.

### INTERNAL RISKS AND ISSUES

Risk description	Proba bility	Imp act	prio rity	Corrective measure
A project member becomes ill and therefore cannot attend a meeting.	3	2	6	Another group member will take over the ill group members work.
Running out of time or missing a deadline.	4	5	20	Make a realistic planning, be responsible and manage time well. Also being strict about consequences of being late or missing deadlines.
Communication problems and disagreements between the group or the group not working well together.	3	6	18	Try to talk to each other, avoid criticism and blaming and encourage feedback instead.

### EXTERNAL RISKS AND ISSUES

Risk description	Proba bility	Imp act	prio rity	Corrective measure
Difficulty getting the right information/data needed.	5	5	25	Be selective with sources and amount of data and drop it if it is irrelevant.
Difficulty picking up the right mathematical models and implementing them in the application.	5	6	30	Turn to the project instructors if needed and use previous projects as help.
Delivering a poor or incomplete product.	4	6	20	Work efficiently and always make sure to have a deliverable product.

## 7. CONTACT INFORMATION

### Instructors

Harald Drillenburg

herald.drillenburg@inholland.nl

Koos van Tubergen

koos.vantubergen@inholland.nl

### Group Members

Bindu van Raak (611629)

611629@student.inholland.nl

Justin Mulder (563558)

563558@student.inholland.nl

Assem Abdellaoui (566456)

566456@student.inholland.nl

Justice Pandt (580014)

580014@student.inholland.nl

Joud Beniamin (617059)

617059@student.inholland.nl