MSc. Geographic Information Systems

**Forest Management using GIS:
Case Study of Koibatek Forest Station**

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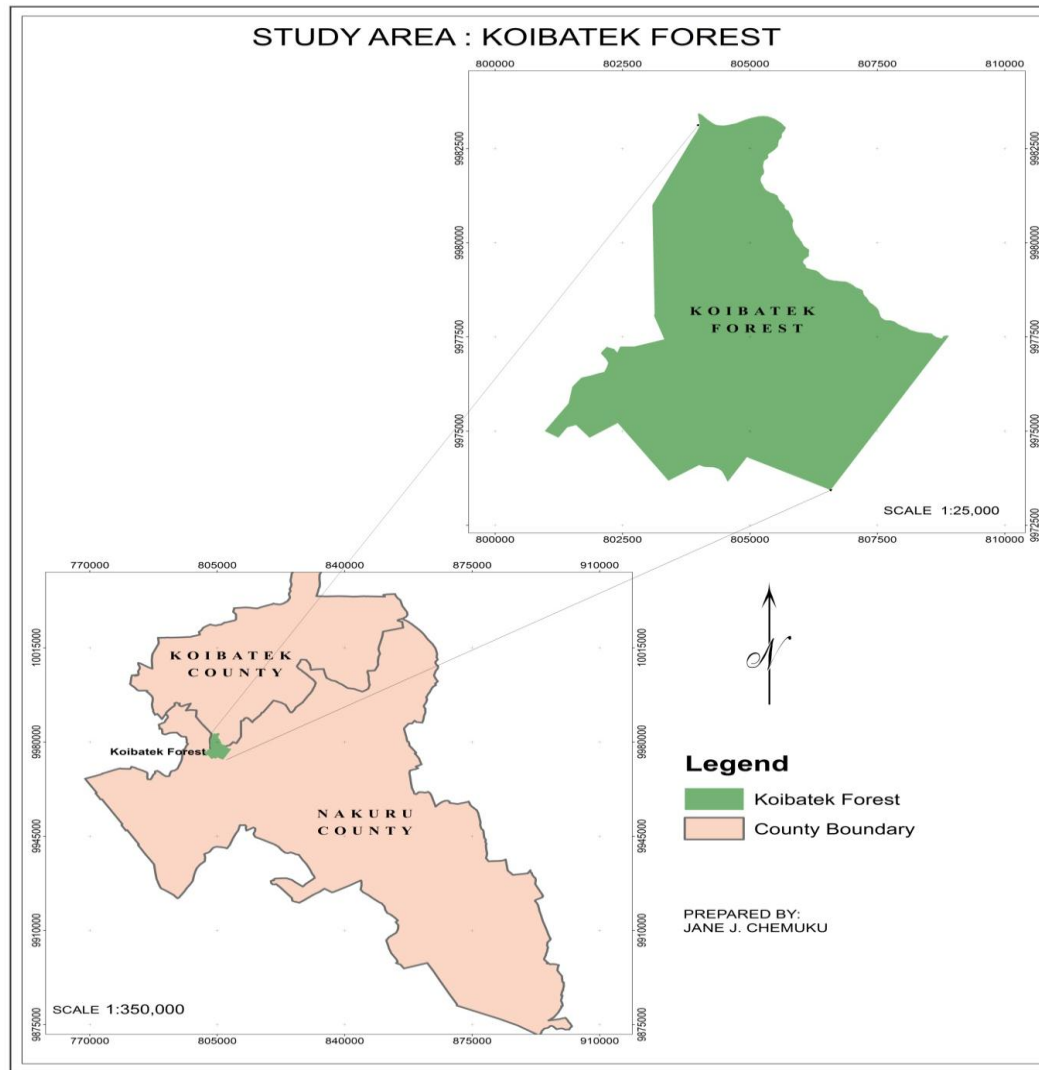
Supervisor: Mr. P.C. Wakoli

Outline

- Introduction

- Objective of the study

- Methodology

- Results and Analysis

- Conclusion and Recommendations

Introduction

Background of the study

- Since the recognition of the need to increase forest cover and reduce forest destruction and degradation, the Government has recognized the critical role of ensuring that tree cover in the country increases.

Study Area

STUDY AREA : KOIBATEK FOREST

KOIBATEK FOREST

SCALE 1:25,000

KOIBATEK COUNTY

Koibatek Forest

NAKURU COUNTY

Legend

Koibatek Forest

County Boundary

PREPARED BY:
JANE J. CHEMUKU

SCALE 1:350,000

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Statement of the problem

- The Kenya Forest Service is in need of a method of monitoring the status of conservation projects within the forest which can enable the managers make accurate and timely decisions to maintain balance in the ecosystem.

Hence there is need to move away from the current manual cartographic methods being used to capture and draw maps to more digital methods where processing of data, map reproduction and analysis are accurate and faster.

Objective of the study

- The main objective of this study is to develop a geodatabase that will facilitate continuous evaluation and monitoring of forest plantations for effective forest management.

Specific objectives

- To map the forest plantations and include important attributes of each plantation.

- To establish and present the area occupied by the various categories of forests and their other significant attributes.

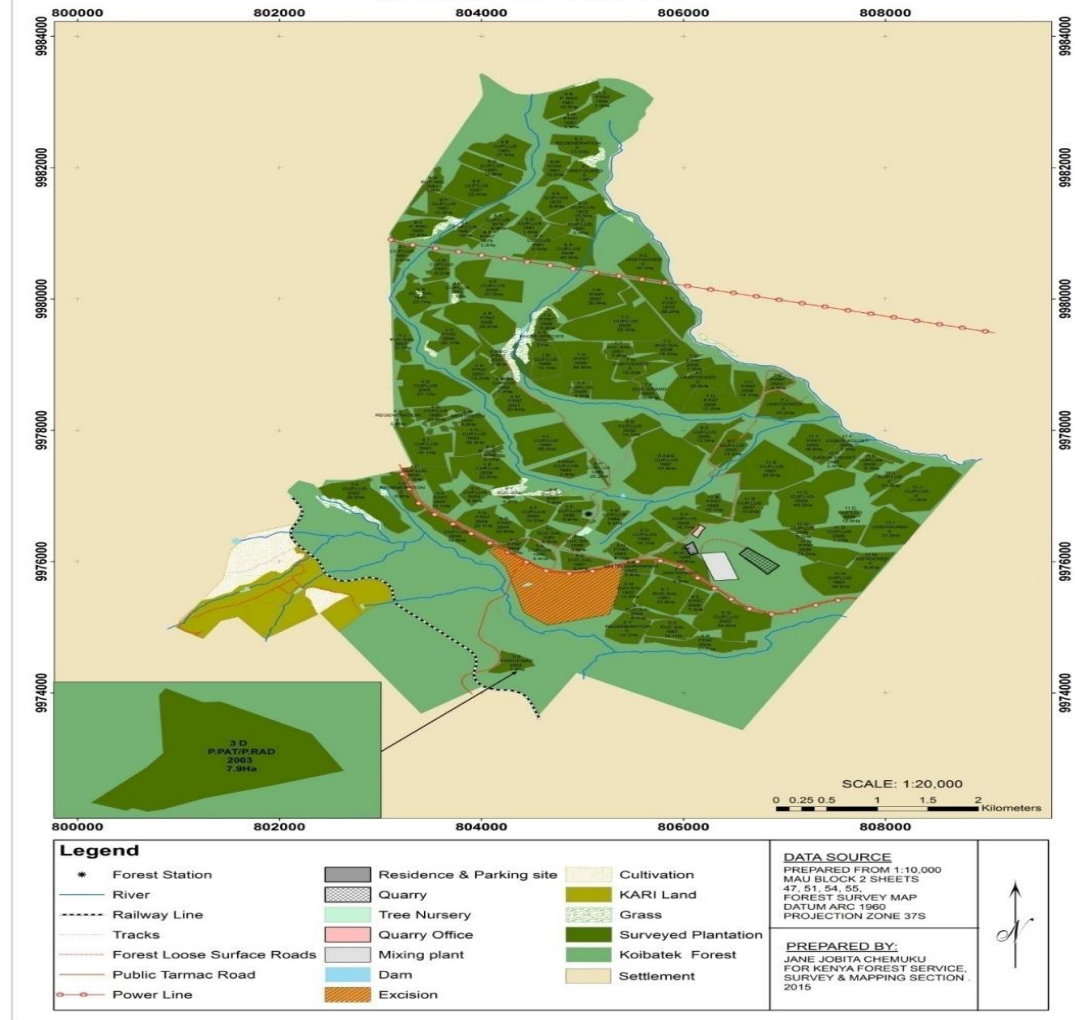- To demonstrate how the database can be used.

Methodology
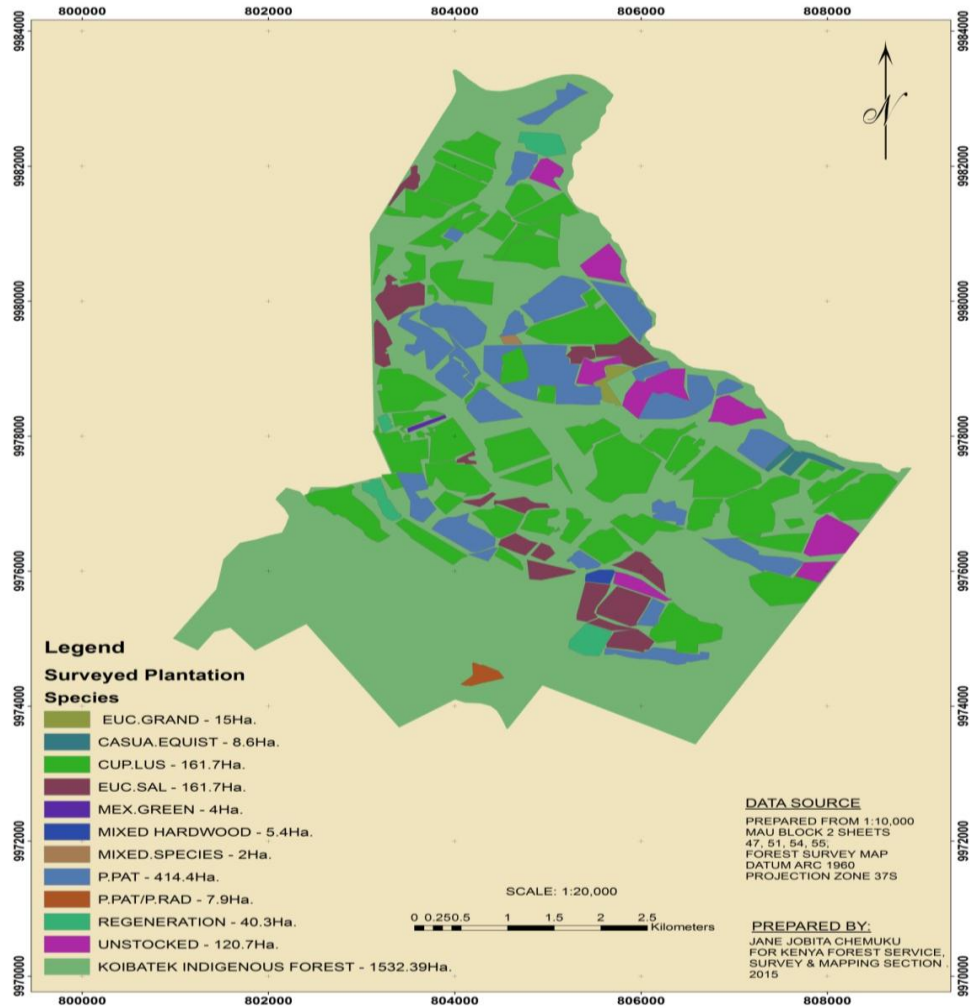

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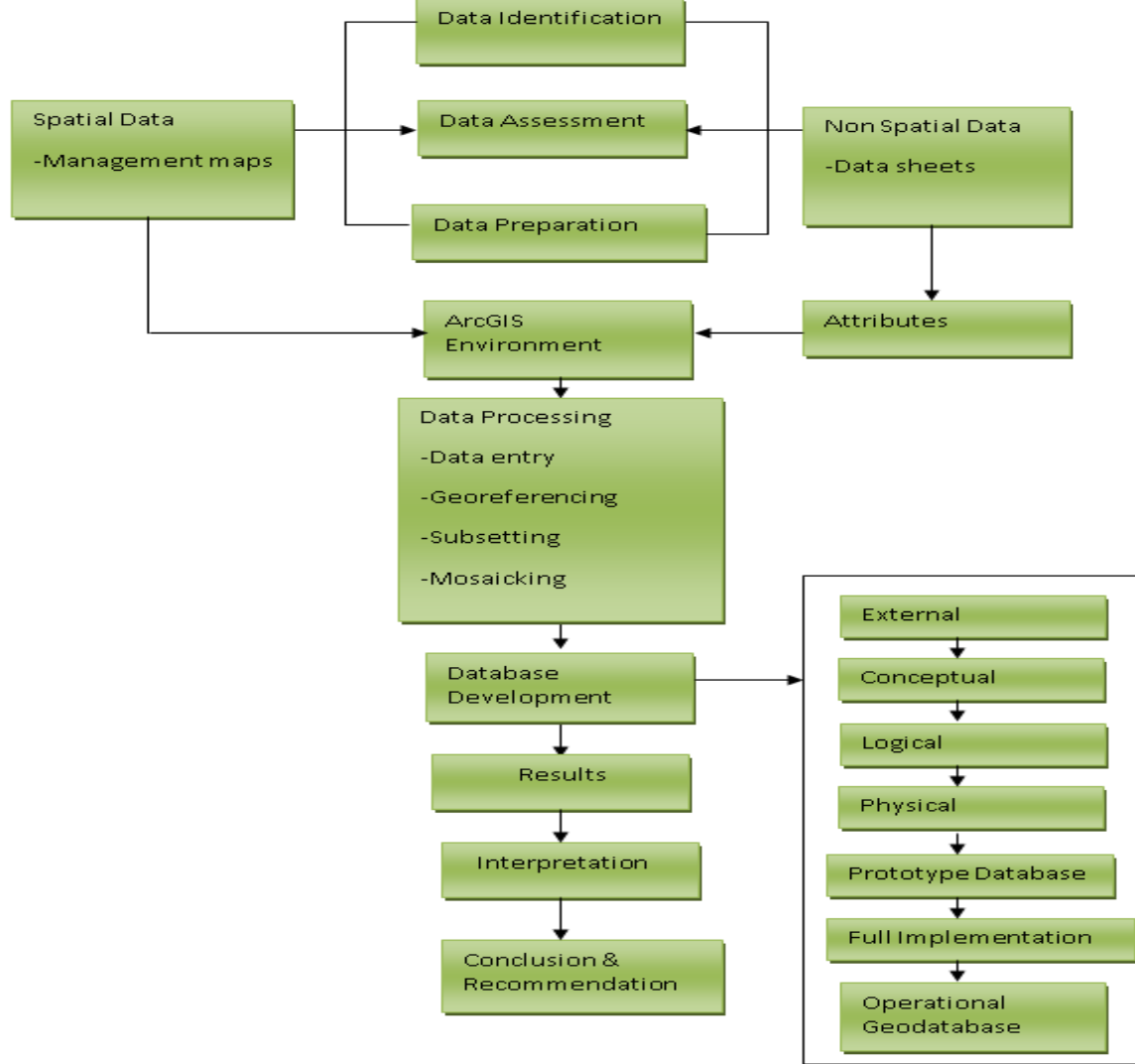
Results and Analysis

Method of Data Analysis

- Bar Chart

- Database query

Forest Plantation map

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Mapping Forest Categories

KOIBATEK FOREST PLANTATION SPECIES

Legend

Surveyed Plantation Species

- EUC.GRAND - 15Ha.
- CASUA.EQUIST - 8.6Ha.
- CUP.LUS - 161.7Ha.
- EUC.SAL - 161.7Ha.
- MEX.GREEN - 4Ha.
- MIXED HARDWOOD - 5.4Ha.
- MIXED.SPECIES - 2Ha.
- P.PAT - 414.4Ha.
- P.PAT/P.RAD - 7.9Ha.
- REGENERATION - 40.3Ha.
- UNSTOCKED - 120.7Ha.
- KOIBATEK INDIGENOUS FOREST - 1532.39Ha.

SCALE: 1:20,000

0 0.25 0.5 1 1.5 2 2.5 Kilometers

DATA SOURCE
PREPARED FROM 1:10,000
MAU BLOCK 2 SHEETS
47, 51, 54, 55;
FOREST SURVEY MAP
DATUM ARC 1960
PROJECTION ZONE 37S

PREPARED BY:
JANE JOBITA CHEMUKU
FOR KENYA FOREST SERVICE,
SURVEY & MAPPING SECTION
2015

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Land use
Land cover

| No of Plantations	Stand Species	Area in Ha.	%
2	CASUA. EQUIST.	8.6	0.2
56	CUP. LUS.	889.8	24.4
16	EUC. SAL.	161.7	4.4
1	MEX. GREEN.	4	0.1
1	MIXED HARDWOOD	5.4	0.1
1	MIXED SPECIES	2	0.1
27	P. PAT.	414.4	11.4
1	P. PAT./ P. RAD.	7.9	0.2
4	REGENERATION	40.3	1.1
8	UNSTOCKED	120.7	3.3
1	EUC. GRAND.	15	0.4
1	INDIGENOUS FOREST	1532.39	42.0
	OTHERS (ESTABLISHMENTS)	444.1	12.2
	TOTAL	3646.29	100.0

Forest area Analysis of Koibatek
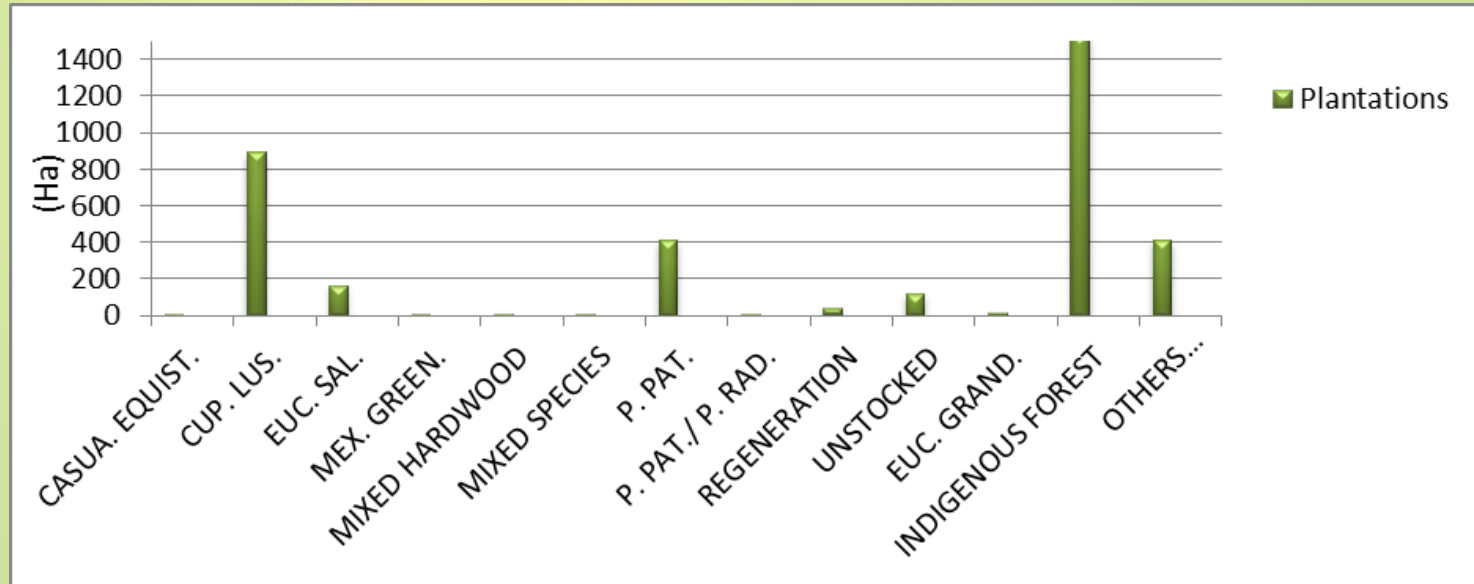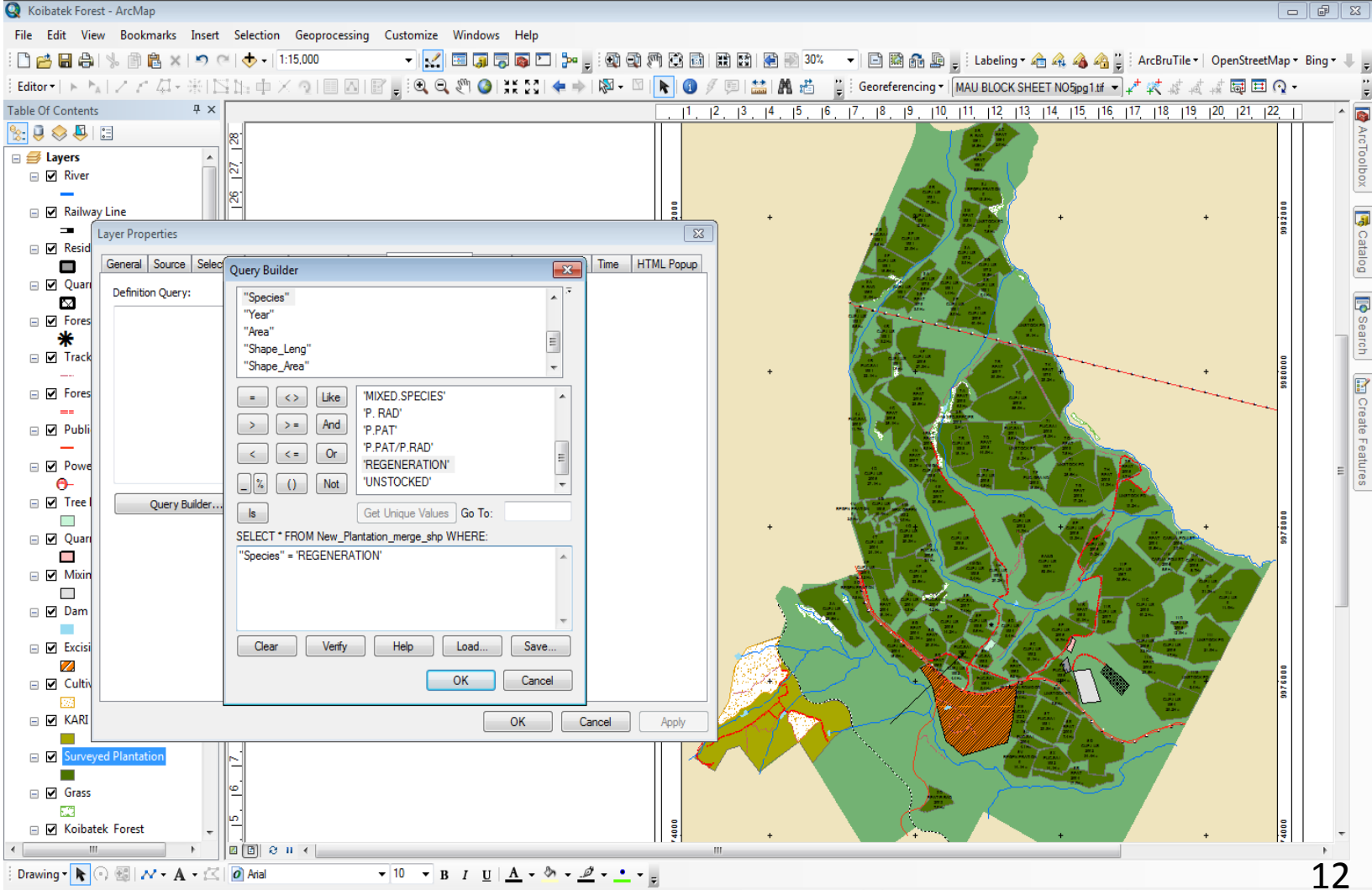
Database Query

Result
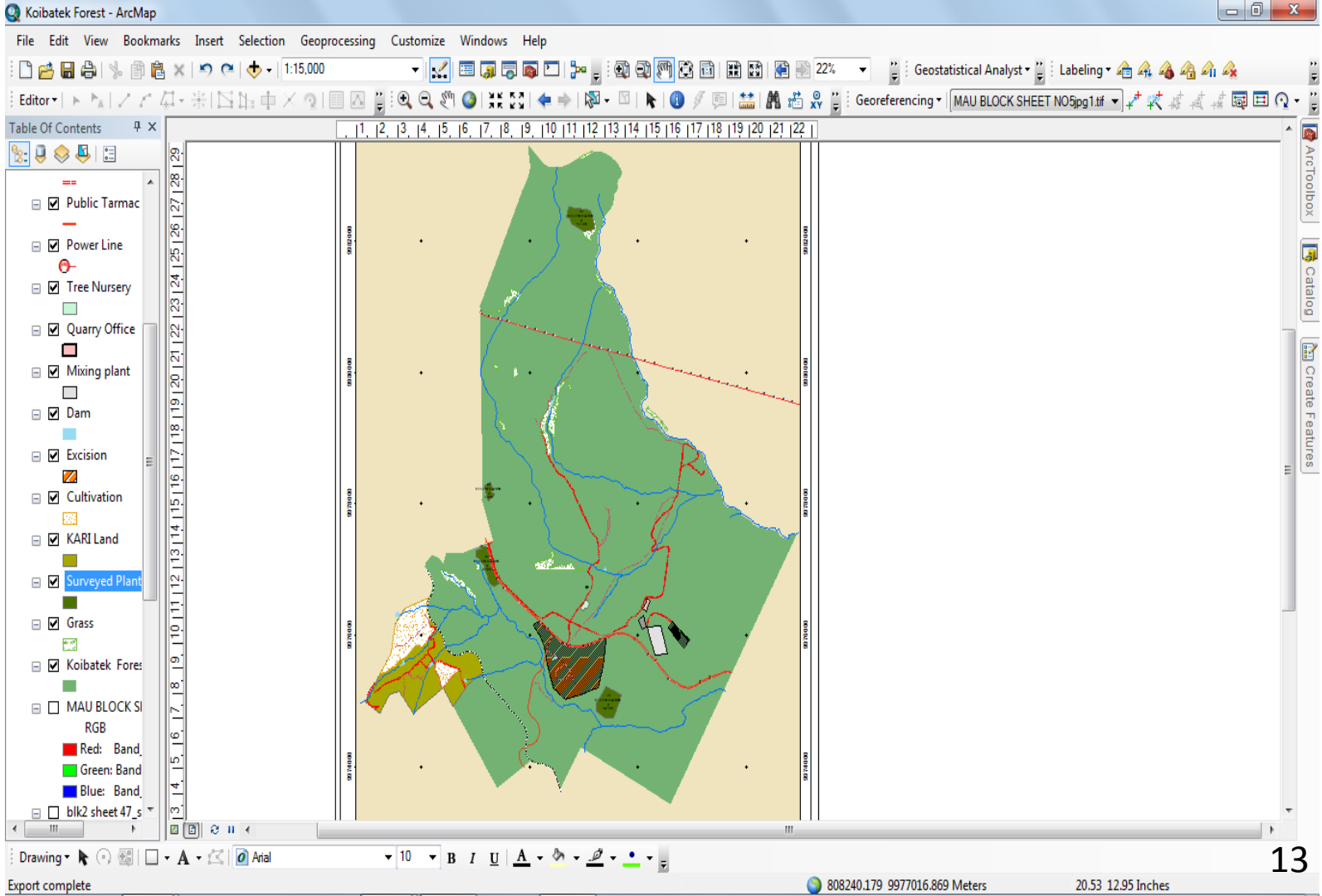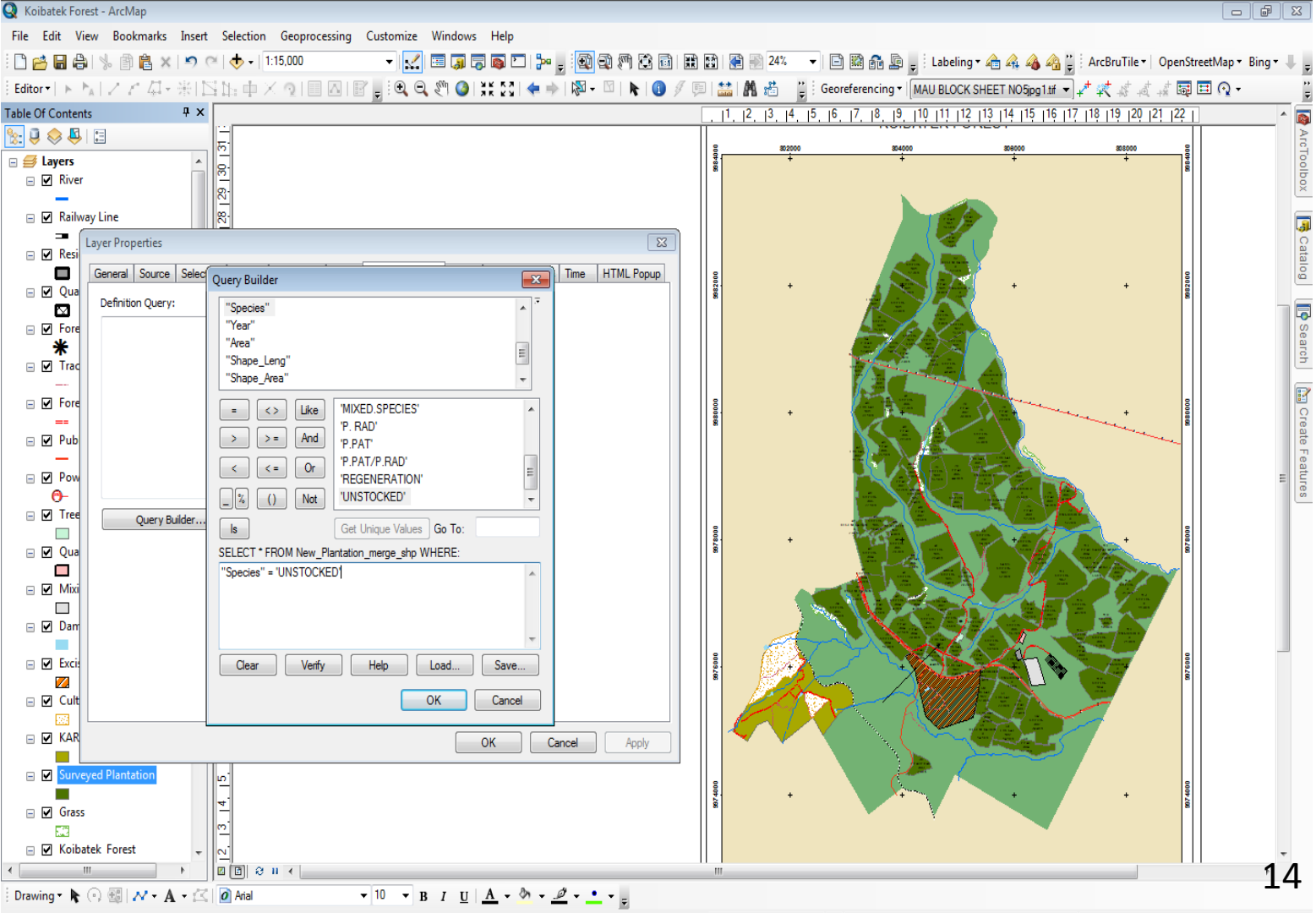
Database Query

Result
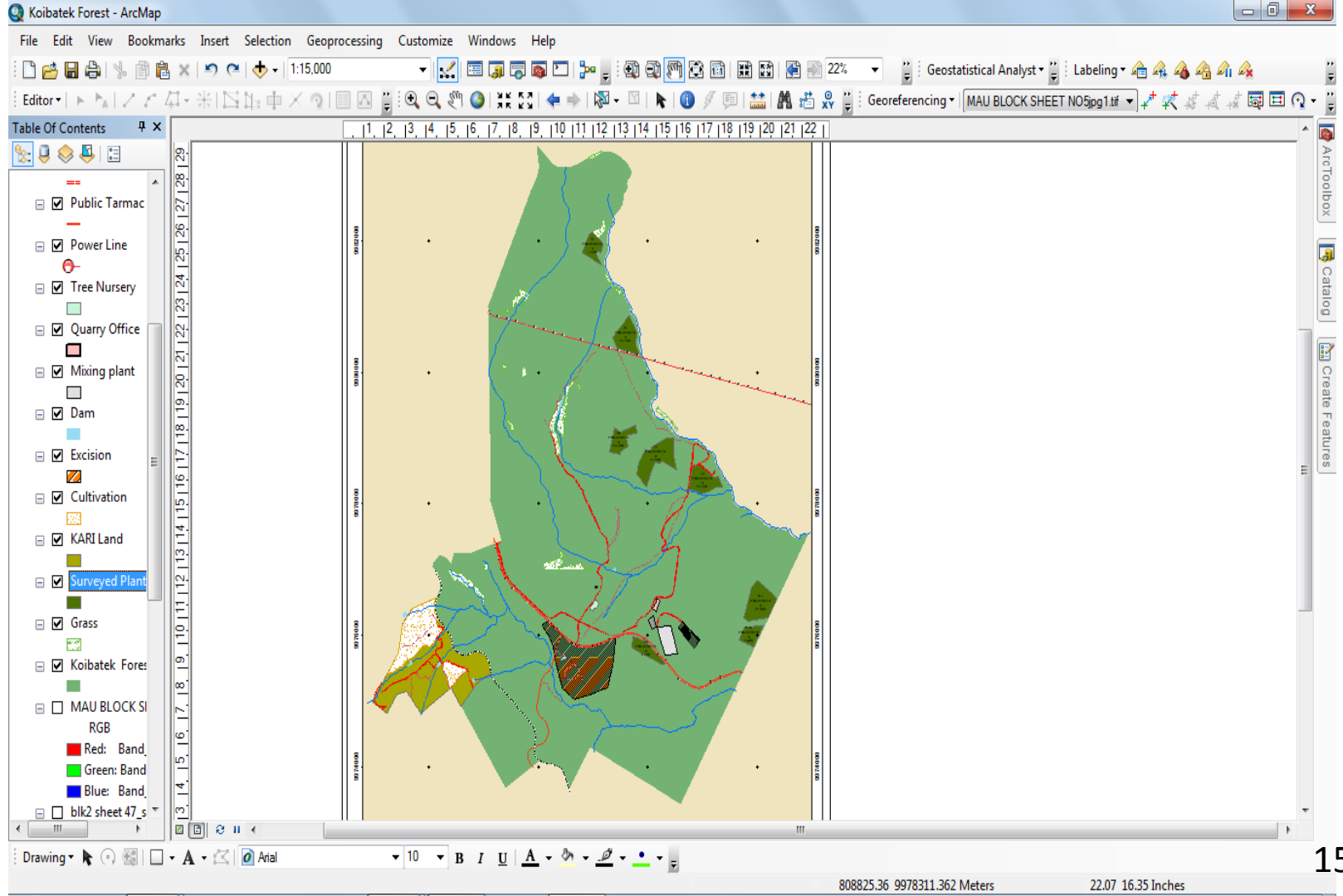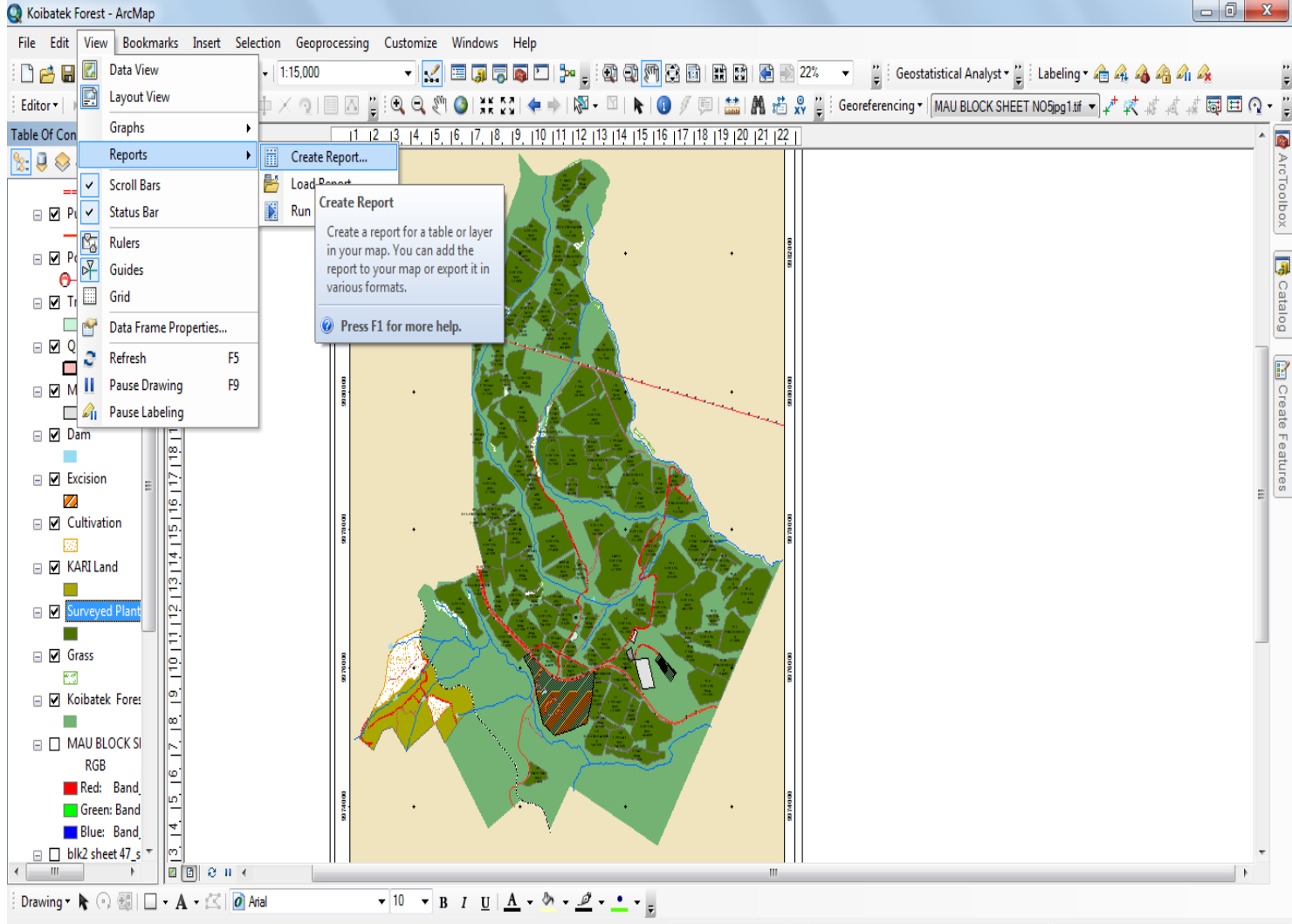
Report generation

Report

Unstocked Plantations

Comp	Sub_comp	Species	Area_1
	5 W	UNSTOCKED	9.5
	11 M	UNSTOCKED	8.4
	11 I	UNSTOCKED	21
	8 I	UNSTOCKED	7.6
	7 J	UNSTOCKED	13.2
	7 I	UNSTOCKED	25.6
	7 Q	UNSTOCKED	19.3
	8 E	UNSTOCKED	16.1

Sum Area_1   120.699999

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Conclusion

- Satellite positioning systems (such as GPS) will play an important role in augmenting traditional forest survey activities.

- Analysis by way of query, bar chart and calculations on the data it becomes more evident how GIS can benefit the resource manager as an organizing mechanism

- Forest management maps were used satisfactorily as base maps for the mapping process

Recommendations

- Training of the Forest managers in the use of basic GIS technology such as the handheld GPS

- Data collected from the field using the handheld GPS would be better retrieved using data cable other than manual writing to avoid errors which later translate to inconsistencies in the maps

- Different factors in the field such as climate, soil and other parameters that are highly interactive with each other should be incorporated in future studies.

- Remote sensing technologies could be incorporated into many areas related to sustainable forest management in future research especially in areas where accessibility is a challenge.