# Module Handbook

## Wildlife Management

## Populations

## REG

By:

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**Master of Forest Science Program**
**Faculty of Forestry**
**UNIVERSITAS GADJAH MADA**
**2021**

# SEMESTER LEARNING PLAN

## A. Identitas Mata Kuliah / *Course Detail*

| | | | |
|---|---|---|---|
| 1. | Mata Kuliah / Course Name | : | Pengelolaan Populasi Satwa Liar / Wildlife Management Populations |
| 2. | Code/Credits/Status | : | KTK 624/2/Pilihan (Elective) |
| 3. | Prerequisite | : | Wildlife is one of the natural resources that provide great benefits for human life. These benefits can be in the form of direct benefits (e.g. to fulfill protein needs, trade commodities and enjoy the beauty of their shape and sound) or indirect in the form of ecosystem balancers (e.g. as pollinators, seed dispersers and control of pests). Therefore, throughout the history of human civilization, humans have a very close relationship with the presence of wildlife in their environment. This fact can be seen through human culture around the world which cannot be separated from the symbol of wildlife. However, the rapid increase in the human population has led to the overexploitation of wildlife which has resulted in a decline in the population of wildlife species and even some of them have become extinct. |
| 4. | Short Description | : | To prevent the extinction of the remaining species, proper management is needed. This management must be carried out based on credible scientific data. In addition, managers must also have adequate knowledge to ensure the sustainability of the population being managed. The Wildlife Population Management course offers a very useful learning method for students who aspire to become wildlife managers, conservation biologists, managers of protected and conservation areas and policy makers in the field of conservation. In this course, students are taught using the Student-Centered Learning (SCL) method through problem-based learning activities, introduction to population modeling simulations, giving individual and group assignments, and presentation of the results of assignments. With these lecture activities, it is expected that each student will be able to understand the substance of lectures, foster leadership and independence, and improve communication and team collaboration skills. |
| 5. | Learning Objective | : | The learning objectives of this course are: 1. Provide knowledge to students about the basic concepts of managing wildlife in their natural habitat. 2. Train students to be able to think critically, logically, |

systematically, structured and creatively in dealing with wildlife population management issues. 3. Provide skills to students in applying various types of modeling of wildlife population dynamics. 4. Cultivate and develop leadership and independence, as well as improve communication and teamwork skills through the process of lecturing activities.

6. Lecturers : Muhammad Ali Imron, SENA ADI SUBRATA, SANDY NURVIANTO

7. Course Learning Outcome (CLO) :

# PLO / PI *Detail*

| PLO 4 | Knowledge (Criticise science, Knowledge, Technology and Art of Forestry) | Able to connect and criticise science, knowledge, technologyand art of forestry based on ecosystem and landscape, covering silviculture, forest management, forest products technology and natural resource conservation. |
|---|---|---|
| PLO 5 | Knowledge (Analyse Comprehensively in the Specific Fields) | *Able to analyze comprehensively updated issues in the specificfields of silviculture, forest management, forest products technology or forest resource conservation, and to recommendpossible solutions based on difined problems.* |
| PLO 7 | Skill (Formulating Research) | *Able to formulate research questions, developing and conducting appropriate plan and methods, collecting and analyzing data, synthesizing and inferring research findings inforestry by multidisciplinary approaches that publishable on nationally accredited and/or reputable international journal.* |
| PLO 6 | SKill (Logic, Critical, Innovative Thinking) | *Able to apply logical, critical, systematic and innovative thinking skills by utilizing information technology to produce solutions in form of  scientific documents individually as well asin a team.* |

## B. Topik Perkuliahan / *Course Materials*

| Bahasan / *Main Discussion* | Estimasi Waktu / *Estimated Times (Hour)* | Kompetensi (*CourseLearning Outcomes*) |
|---|---|---|
| Introduction to wildlife population management | 2 | Students are expectedto be able to explain the principles and elements of wildlife population |
| Wildlife survey | 2 | Students are expectedto be able to explain several survey techniques to invent and to monitor wildlifepopulation in the wild, including the standardoperating procedure, assumptions, and analysis. |
| Population Growth Models | 2 | Students are expected to be able explain and to do population growthmodels computation. |
| Population Dynamics | 2 | Student are expectedto be able explain the population dynamics concept, theory and application in the wildlife population management. |
| Genetics and Extinction | 2 | Students are expected to be able to explain the role of population genetics in acceleratingthe extinction probability of a species and how to maintain the population geneticsdiversity to prevent a species from extinctionthat is caused by demographic st |

| Bahasan / *Main Discussion* | Estimasi Waktu / *Estimated Times (Hour)* | Kompetensi (*CourseLearning Outcomes*) |
|---|---|---|
| Minimum Viable Population (MVP) and Population Viability Analysis(PVA) | 2 | Students are expected to be able to explain the concept, theory andapplication of MVP and PVA in preventing a species from extinction. |
| Decimating factors of wildlife population | 2 | Students are expected to be able to explain the decimating factors of wildlife population and how to manage those factors to achievethe management goals. |
| Population regulation, fluctuation and competition | 2 | Students are expectedto be able to explain about the population regulation, fluctuationand competition and the impact of their patterns on long term population survival. |

| Bahasan / *Main Discussion* | Estimasi Waktu / *Estimated Times (Hour)* | Kompetensi (*CourseLearning Outcomes*) |
|---|---|---|
| Metapopulation Ecology I | 2 | Students are expected to be able to explain the meta population theory and application, especially classical Levin's Model. |
| Metapopulation Ecology II | 2 | Students are expected to be able to explain the meta population theory and application, especially extension ofLevin's Model. |
| Conservation of Small Population | 2 | Students are expected to be able to explain and to assess effectivepopulation size and inbreeding depression in a wildlife population, and formulating the conservation strategy for it population. |

| Bahasan / *Main Discussion* | Estimasi Waktu / *Estimated Times (Hour)* | Kompetensi (*CourseLearning Outcomes*) |
|---|---|---|
| Case Study | 2 | Student are expected to be able to identify the problems in a caseof wildlife management, to identify the solution options for the problems, and create the management strategy to deal with the problems includingthe criteria and indicators of each achi |

## C. Rencana Asesmen / Assesment Plan

| CO/CPMK | Tipe / *Type* | Deskripsi / *Description* | Persentase / *Percentage* | PLO/SO/ELO/CPL/LG |
|---------|---------------|---------------------------|---------------------------|-------------------|
| CLO-1 | Mid Term Exam | Questions | 10 | PLO 4 |
| CLO-2 | Mid Term Exam | Questions | 10 | PLO 5 |
| CLO-2 | Assignment | Assignment | 5 | PLO 5 |
| CLO-3 | Mid Term Exam | Questions | 10 | PLO 5 |
| CLO-3 | Quiz | Assignment | 5 | PLO 5 |
| CLO-4 | Final Exam | Questions | 10 | PLO 5 |
| CLO-4 | Quiz | Questions | 5 | PLO 5 |
| CLO-5 | Final Exam | Questions | 20 | PLO 6 |
| CLO-5 | Final Exam | Questions | 10 | PLO 5 |
| CLO-5 | Assignment | Assignment | 10 | PLO 7 |
| CLO-5 | Assignment | Assignment | 5 | PLO 6 |

## D. Referensi / References

Allendorf, F.W. & Luikart, G. (2006) Conservation and the Genetics of Populations.

Blackwell PublishingBernstein, R. (2003) Population Ecology: An Introduction to Computer

Simulations. Wiley

Braude, S. & Low, B. (2010) An Introduction to Methods & Models in
Ecology, Evolution, &Conservation. Princeton University Press

Hamilton, M. (2009) population Genetics. Wiley-Blackwell

Mills, L.S. (2012) Conservation of Wildlife Populations: Demography, Genetics, and Management.
Wiley-Blakwell

Rockwood, L.L. (2015) Introduction to Population Ecology. Second Edition. Wiley-Blackwell

Sinclair, A.R.E., Fryxell, J.M., & Caughley, G. (2006) Wildlife Ecology, Conservation and Management.Second Edition. Blackwell Publishing

Vandermeer, J.H. & Goldberg, D.E. (2013) Population Ecology: First Principles. Second Edition.Princeton University Press

## E. Rencana Kegiatan Pembelajaran Mingguan (RKPM) / *Weakly Teaching Plan*

| Pertemuan / Week | Tujuan Ajar / *Learning Objective* | Topik / *Topic* | Media Ajar / *Teaching Media* | Metode Assesment / *Assesment Method* | Metode Ajar / *Teaching Method* | Aktivitas Mahasiswa / *Student Activity* | Aktivitas Dosen / *Lecturer Activity* | Sumber Ajar / *Learning Resources* |
|---|---|---|---|---|---|---|---|---|
| 1 | Students are expected to be able to explain the principles and elements of wildlife population | Introduction to wildlife population management | Power Point Presentation | Activeness in class discussion<br><br>Accuracy in answering exam questions | Face to face and classroom discussion (via online) | pay attention to the lecture follow the discussion actively | Give a lecture Open discussion | Rockwood, L.L. (2015) Introduction to Population Ecology. Second Edition. Wiley-Blackwell Sinclair, A.R.E., Fryxell, J.M., & Caughley, G. (2006) Wildlife Ecology, Conservation and Management. Second Edition. Blackwell Publishing Vandermeer, J.H. & Goldberg, D.E. (2013) Population Ecology: First Principles. Second Edition. Princeton University Press |
| 2 | Students are expected to be able to explain several survey techniques to invent and to monitor wildlife population in the wild, including the standard operating procedure, assumptions, and analysis. | Wildlife Survey | Power Point Presentation | Activeness in class discussion<br><br>Accuracy in answering exam questions | Face to face and classroom discussion (via online) | pay attention to the lecture follow the discussion actively | Give a lecture<br><br>Open discussion<br><br>Give assignment | Rockwood, L.L. (2015) Introduction to Population Ecology. Second Edition. Wiley-Blackwell<br><br>Sinclair, A.R.E., Fryxell, J.M., & Caughley, G. (2006) Wildlife Ecology, Conservation and Management. Second Edition. Blackwell Publishing<br><br>Vandermeer, J.H. & Goldberg, D.E. (2013) Population Ecology: First Principles. |

| Pertemuan / Week | Tujuan Ajar / *Learning Objective* | Topik / *Topic* | Media Ajar / *Teaching Media* | Metode Assesment / *Assesment Method* | Metode Ajar / *Teaching Method* | Aktivitas Mahasiswa / *Student Activity* | Aktivitas Dosen / *Lecturer Activity* | Sumber Ajar / *Learning Resources* |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Second Edition. Princeton University Press |
| 3 | Students are expected to be able to explain and to do population growth models computation. | Population Growth Models | Power Point Presentation | Activeness in class discussion  Accuracy in answering exam questions | Face to face and classroom discussion (via online) | pay attention to the lecture  follow the discussion actively | Give a lecture  Open discussion | Bernstein, R. (2003) Population Ecology: An Introduction to Computer Simulations. Wiley Mills, L.S. (2012) Conservation of Wildlife Populations: Demography, Genetics, and Management. Wiley-Blakwell Rockwood, L.L. (2015) Introduction to Population Ecology. Second Edition. Wiley-Blackwell |
| 4 | Student are expected to be able explain the population dynamics concept, theory and application in the wildlife population management. | Population Dynamics | Power Point Presentation | Activeness in class discussion Accuracy in answering exam questions | Face to face and classroom discussion (via online) | pay attention to the lecture follow the discussion actively | Give a lecture Open discussion | Rockwood, L.L. (2015) Introduction to Population Ecology. Second Edition. Wiley-Blackwell Sinclair, A.R.E., Fryxell, J.M., & Caughley, G. (2006) Wildlife Ecology, Conservation and Management. Second Edition. Blackwell Publishing Bernstein, R. (2003) Population Ecology: An Introduction to Computer Simulations. Wiley |

| Pertemuan / Week | Tujuan Ajar / Learning Objective | Topik / Topic | Media Ajar / Teaching Media | Metode Assesment / Assesment Method | Metode Ajar / Teaching Method | Aktivitas Mahasiswa / Student Activity | Aktivitas Dosen / Lecturer Activity | Sumber Ajar / Learning Resources |
|---|---|---|---|---|---|---|---|---|
| 5 | Students are expected to be able to explain the role of population genetics in accelerating the extinction probability of a species and how to maintain the population genetics diversity to prevent a species from extinction that is caused by demographic st | Genetics and Extinction | Power Point Presentation | Activeness in class discussion Accuracy in answering exam questions | Face to face and classroom discussion (via online) | pay attention to the lecture follow the discussion actively | Give a lecture Open discussion | Allendorf, F.W. & Luikart, G. (2006) Conservation and the Genetics of Populations. Blackwell Publishing Hamilton, M. (2009) population Genetics. Wiley-Blackwell Mills, L.S. (2012) Conservation of Wildlife Populations: Demography, Genetics, and Management. Wiley-Blakwell |
| 6 | Students are expected to be able to explain the concept, theory and application of MVP and PVA in preventing a species from extinction. | Minimum Viable Population (MVP) and Population Viability Analysis(PVA) | Power Point Presentation Excel | Activeness in class discussion Accuracy in answering exam questions | Face to face and classroom discussion (via online) | pay attention to the lecture follow the discussion actively | Give a lecture Open discussion Give assignment | Braude, S. & Low, B. (2010) An Introductionto Methods & Models in Ecology, Evolution, & Conservation. Princeton University Press Mills, L.S. (2012) Conservation of Wildlife Populations: Demography, Genetics, and Management. Wiley-Blakwell |
| 7 | Students are expected to be able to explain the decimating factors of wildlife population and how to manage those factorsto achieve the management goals. | Decimating factors of wildlife population | Power Point Presentation Videos | Activeness in class discussion Accuracy in answering exam questions | Face to face and classroom discussion (via online) | pay attention to the lecture follow the discussion actively | Give a lecture Open discussion Give assignment | Sinclair, A.R.E., Fryxell, J.M., & Caughley, G. (2006) Wildlife Ecology, Conservation and Management. Second Edition. Blackwell Publishing |

| Pertemuan / Week | Tujuan Ajar / Learning Objective | Topik / Topic | Media Ajar / TeachingMedia | Metode Assesment / Assesment Method | Metode Ajar / Teaching Method | Aktivitas Mahasiswa / Student Activity | Aktivitas Dosen / Lecturer Activity | Sumber Ajar / Learning Resources |
|---|---|---|---|---|---|---|---|---|
| 8 | Students are expected to be able to explain about the population regulation, fluctuation and competition and the impact of their patterns on long term population survival. | Population regulation, fluctuation and competition | Power Point Presentation Videos | Activeness in class discussion Accuracy in answering exam questions | Face to face and classroom discussion (via online) | pay attention to the lecture follow the discussion actively | Give a lecture Open discussion | Sinclair, A.R.E., Fryxell, J.M., & Caughley, G. (2006) Wildlife Ecology, Conservation and Management. Second Edition. Blackwell Publishing |
| 9 | Students are expected to be able to explain the meta population theory and application, especially classical Levin's Model. | Metapopulation Ecology I | Power Point Presentation Excel Videos | Activeness in class discussion Accuracy in answering exam questions | Face to face and classroom discussion (via online) | pay attention to the lecture follow the discussion actively | Give a lecture Open discussion | Mills, L.S. (2012) Conservation of Wildlife Populations: Demography, Genetics, and Management. Wiley-Blakwell Rockwood, L.L.(2015) Introduction toPopulation Ecology. Second Edition.Wiley-Blackwell Sinclair, A.R.E., Fryxell, J.M., & Caughley, G. (2006) Wildlife Ecology, Conservation and Management. Second Edition. Blackwell Publishing |

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|---|---|---|---|---|---|---|---|---|
| 10 | Students are expected to be able to explain the meta population theory and application, especially extension of Levin's Model. | Metapopulation Ecology II | Power Point Presentation Excel Videos | Activeness in class discussion Accuracy in answering exam questions | Face to face and classroom discussion (via online) | pay attention to the lecture follow the discussion actively | Give a lecture Open discussion Give assignment | Mills, L.S. (2012) Conservation of Wildlife Populations: Demography, Genetics, and Management. Wiley-Blakwell Rockwood, L.L.(2015) Introduction toPopulation Ecology. Second Edition.Wiley-Blackwell Sinclair, A.R.E., Fryxell, J.M., & Caughley, G. (2006) Wildlife Ecology, Conservation and Management. Second Edition. Blackwell Publishing |
| 11 | Students are expected to be able to explain and to assess effective population size and inbreeding depression in a wildlife population, and formulating the conservation strategy for it population. | Conservationof Small Population | Power Point Presentation Excel Videos | Activeness in class discussion Accuracy in answering exam questions | Face to face and classroom discussion (via online) | pay attention to the lecture follow the discussion actively | Give a lecture Open discussion Give assignment | Braude, S. & Low, B. (2010) An Introductionto Methods & Models in Ecology, Evolution, & Conservation. Princeton University Press Mills, L.S. (2012) Conservation of Wildlife Populations: Demography, Genetics, and Management. Wiley-Blakwell Rockwood, L.L.(2015) Introduction toPopulation Ecology. Second Edition.Wiley-Blackwell |

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|---|---|---|---|---|---|---|---|---|
| 12 | Student are expected to be able to identify the problems in a case of wildlife management, to identify the solution options for the problems, and create the management strategy to deal with the problems including the criteria and indicators of each achi | Case Study | Power Point Presentation

Video

Scientific Papers | Presentation ability

Ability to solve management problems that is presented in the case study. | Case Study | Doing the assignment

Presentation Discussion | Assess the students assignment

Discussion | Sinclair, A.R.E., Fryxell, J.M., & Caughley, G. (2006) Wildlife Ecology, Conservation and Management. Second Edition. Blackwell Publishing |