

KSH 314 Inventory and Monitoring of Wildlife

Credit	: 3(2-3)
Semester	: 5 (odd)
Course format	: Classroom lectures, individual assignment, group assignment. 110 minutes per week. 14 week.
Pre-requisite	: Statistical Methodology (STK211) and Wildlife Ecology (KSH211)
Lecturers	: Dr. Yanto Santosa, DEA (Course coordinator) Dr. Mirza Dikari Kusrini, MSi Dr. Abdul Haris Mustari, MSc.F.

Course Description

This course explains about the meaning, use and application of direct and indirect inventory techniques to estimate demographic parameters of wildlife population. Apart from basic understanding (sampling, census and data analysis method), wildlife estimation method is also given based on vertebrate taxon specifically terrestrial.

Course Objectives

This course is designed to give students a fundamental understanding wild animal inventory methods in generally, and give understanding about analysis statistic method and sampling procedure in wild animal inventory method, census method of wild animal (quiet observer, observer moves, driving and concentration count, abattoir method), stock taking method according to sampling and index/ordinally (points, transect, compartment, CMR, CMO), discovery method not direct (trace, activity, voice, remote sensing), bird and herpetofauna inventory method.

Learning Outcome

1. General learning outcomes

Upon successful completion of this course the students will be able to:

Explain the meaning, use and able to apply wildlife inventory techniques and data analysis to obtain and provide information on wildlife to support wildlife management.

2. Specific learning outcomes

Upon successful completion of this course the student will have been able to:

- a. Describe all methods in technique inventory may be done in a wild animal inventory activity
- b. Describe rule in a inventory activity either through also sampling census activity
- c. Describe function, inventory methods classification either through by census and sampling (belong in pass direct discovery also not direct)
- d. Describe base rule and matter in wild animal inventory method activity lir pass approach wild animal discovery directly
- e. Describe base rule and matter in inventory wild animal activity lir pass approach wild animal discovery indirectly
- f. Describe each surplus and weakness from each method, either through census and sampling also stock taking activity passes direct discovery and not direct
- g. Describe wild animal inventory method taking technique in several wild animal kinds (mammals, bird, herpetofauna)
- h. Describe various rules and techniques in bird inventory activity (list of type, encounter rate, transect, points-IPA)
- i. Describe various rule and technique in inventory activity herpetofauna

Structure of Course Delivery

1. Lectures
2. Course practice. This comprise of individual and group assignment.
3. Guides for course practice

Major References

1. Seber 1982. The Estimation of Animal Abundance & Related Parameters. 2nd ed. Edward Arnold. London
2. Norton Griffiths. 1975. Counting Animals. African Wildlife Leadership Foundation. Kenya
3. Cochran, W.G. 1991. Teknik Penarikan Contoh. UI-Press. Jakarta

Teaching Material Support

The choice of media and type of technology use include:

1. Face-to-face contact.

2. Printed power point presentation. Lecture notes in form of printed out power point presentation are available for each topic.
3. It is recommended that students supplement the lecture notes by reading related textbooks.
4. Computer.
5. Projector Infocus.
6. Whiteboard.

Course Outline

Topics	Sub-topics	Bloom's Taxonomy	Week
Introduction	<ol style="list-style-type: none"> 1. Background 2. Objectives and benefits 3. Scope of course 4. Linkage with other courses 5. Lecture/course practice conduct and valuation system 6. References 	C1, C2	1
Statistical method and sampling procedure in wildlife inventory	<ol style="list-style-type: none"> 1. Point estimation 2. Interval estimation 3. Accuracy 4. Precision 5. Coefficient variation 6. Sampling unit 7. Random sampling 8. Systematic & stratified samplings 	C1, C2	2 & 3
Wildlife census methods	<ol style="list-style-type: none"> 1. Still observer 2. Moving observer 3. Combination of still and moving observer 4. Driving count 5. Concentration count 	C1, C2, C3	4 & 5
Sampling and index/ordinal inventory methods	<ol style="list-style-type: none"> 1. Point 2. Transect 3. Combination of point-transect 4. Plot 5. Capture-mark-recapture (CMR) 6. Capture-mark-observation 	C1, C2, C3	6, 7 & 8
Indirect methods	<ol style="list-style-type: none"> 1. Footprints 2. Activities 3. Calls/voices 4. Radar and remote sensing 	C1, C2, C3	9
Method of bird population inventory	<ol style="list-style-type: none"> 1. Species list 2. Encounter Rate 3. Transect 4. Point (IPA) 	C1, C2, C3	10 & 11
Method of herpetofauna population inventory	<ol style="list-style-type: none"> 1. Calculating amphibians 2. Calculating reptiles 	C1, C2, C3	12 & 13
Method of wildlife population monitoring	<ol style="list-style-type: none"> 1. Case studies 	C3, C4	14

Potential Course Overlap

There will be some deliberate controlled overlap topics with other courses, such as Statistical Method (STK211) and Wildlife Ecology (KSH211).

Evaluation and Grading

1. Mid-term examination

Midterm examination will be held during examination period scheduled by the Registrar's office (after 7 week lecture). Each exam is composed of multiple choice questions (A, B, C, D and E), True or False, and essay questions at different cognitive level. Duration of exam is 120 minutes. The exam will cover course topics delivered in week 1-7. A key and score will be attached on announcement board after exam paper is graded.

2. Final examination

Final examination will be held during examination period scheduled by the Registrar's office (after 14 week lecture). Each exam is composed of multiple choice questions (A, B, C, D and E), True or False, and essay questions at different cognitive level. Duration of exam is 120 minutes. The exam will cover course topics delivered in week 8-14. A key and score will be attached on announcement board after paper exam is graded.

3. Course Practice

Each student is required to submit a review paper relevant to a practice discussed. This assigned paper is objected to help students make connections between lecture material and real life applications. Research using library, internet and other resources is required. No standardized format for paper writing. The paper is graded based on writing format, clarity and information accuracy, conclusion, and references. Remarked paper will be returned as a feedback.

Compositions of grading are as follows:

Assessment Tools	Maximum Score	% of Grade
Mid-term examination	100	25 %
Final examination	100	35 %
Course practice examination	100	25 %
Course practice reports	100	15 %

Final grade classification: A (≥ 75); B (68-74); C (60-67); D (55-59); E (< 55)

**Coverage of DFORCE Core Competence
in Inventory and Monitoring of Wildlife (KSH 314)**

Code : KSH 314

Course : Inventory and Monitoring of Wildlife

Credit : 3(2-3)

Code	Core Competencies	Course Content Covered	Cognitive Level	Topic
I	Students will be able to understand the scope of wildlife inventory and the use linkage of wildlife inventory methods with wildlife management	Background Objectives and benefits Scope of course Linkage with other courses Lecture/course practice conduct and valuation system References	C1, C2	Introduction
II	Students will be able to understand statistical theories in relation to wildlife inventory including its parameters	Point estimation Interval estimation Accuracy Precision Coefficient variation Sampling unit Random sampling Systematic & stratified samplings	C1, C2	Statistical method and sampling procedure in wildlife inventory
III	Students will be able to understand and understand the use of census method	Still observer Moving observer Combination of still and moving observer Driving count Concentration count	C1, C2, C3	Wildlife census methods
IV	Students will be able to understand	Point	C1, C2, C3	Sampling and index/ordinal

Code	Core Competencies	Course Content Covered	Cognitive Level	Topic
	and understand sampling and index and ordinal inventory methods	Transect Combination of point-transect Plot Capture-mark recapture (CMR) Capture-mark-observation		inventory methods
V	Students will be able to understand and understand the use of indirect methods in wildlife inventory	Footprints Activities Calls/voices Radar and remote sensing	C1, C2, C3	Indirect methods
VI	Students will be able to understand and understand the use and how to use various bird inventory methods in wildlife management	Species list Encounter Rate Transect Point (IPA)	C1, C2, C3	Method of bird population inventory
VII	Students will be able to understand and understand the use and how to use various herpetofauna inventory methods in wildlife management	Calculating amphibians Calculating reptiles	C1, C2, C3	Method of herpetofauna population inventory
VIII	Students will be able to understand the use and apply wildlife inventory methods that have been studies in wildlife monitoring for conservation activities	Case studies	C1, C2, C3, C4	Method of wildlife population monitoring

**Assessment Tools to Measure the Achievement of
Learning Outcomes in Inventory and Monitoring of Wildlife (KSH 314)**

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Code	Core Competencies	Learning Outcome	Bloom's Taxonomy	Assessment Tool(s)	Learning Activities
I	Students will be able to understand the scope of wildlife inventory and the use linkage of wildlife inventory methods with wildlife management	Students will be able to explain the scope of wildlife inventory and the use linkage of wildlife inventory methods with wildlife management	C1, C2	Written examinations at different cognitive level (mid-term exam).	Classroom lecture and discussion
II	Students will be able to understand statistical theories in relation to wildlife inventory including its parameters	Students will be able to explain statistical theories in relation to wildlife inventory including its parameters	C1, C2	Written examinations at different cognitive level (mid-term exam).	Classroom lecture and discussion, illustration
III	Students will be able to understand and use of census method	Students will be able to explain the use of census method	C1, C2, C3	Written examinations at different cognitive level (mid-term exam).	<ul style="list-style-type: none"> • Classroom lecture and discussion, illustration • Outdoor course practice
IV	Students will be able to understand and use sampling and index and ordinal inventory methods	Students will be able to explain sampling and index and ordinal inventory methods	C1, C2, C3	Written examinations at different cognitive level (mid-term and final exam).	<ul style="list-style-type: none"> • Classroom lecture and discussion, illustration • Outdoor course practice
V	Students will be able to understand and use of indirect methods in wildlife inventory	Students will be able to explain the use of indirect methods in wildlife inventory	C1, C2, C3	Written examinations at different cognitive level (final exam).	<ul style="list-style-type: none"> • Classroom lecture and discussion, illustration

Code	Core Competencies	Learning Outcome	Bloom's Taxonomy	Assessment Tool(s)	Learning Activities
					<ul style="list-style-type: none"> • Outdoor course practice
VI	Students will be able to understand and understand the use and how to use various bird inventory methods in wildlife management	Students will be able to understand and explain the use and how to use various bird inventory methods in wildlife management	C1, C2, C3	Written examinations at different cognitive level (final exam).	<ul style="list-style-type: none"> • Classroom lecture and discussion, illustration • Outdoor course practice
VII	Students will be able to understand and understand the use and how to use various herpetofauna inventory methods in wildlife management	Students will be able to understand and explain the use and how to use various herpetofauna inventory methods in wildlife management	C1, C2, C3	Written examinations at different cognitive level (final exam).	<ul style="list-style-type: none"> • Classroom lecture and discussion, illustration • Outdoor course practice
VIII	Students will be able to understand the use and apply wildlife inventory methods that have been studies in wildlife monitoring for conservation activities	Students will be able to explain the use and apply wildlife inventory methods that have been studies in wildlife monitoring for conservation activities	C1, C2, C3, C4	Written examinations at different cognitive level (final exam).	Classroom lecture and discussion