

# UNIVERSIDAD AUTÓNOMA DE BAJA CALIFORNIA

## COORDINACIÓN GENERAL DE FORMACIÓN PROFESIONAL

### LEARNING MODULE

#### I. GENERAL INFORMATION

1. School: Facultad de Ciencias; Campus Ensenada.
2. Major: Biólogo
3. Study Program: 2017-2
4. Learning Module Name: Evidence-Based Conservation
5. Number: 39230
6. CH: 02 WH: 02 LH: 00 FPH: 00 CLH: 00 EH: 02 CR: 06
7. Stage: Terminal
8. Module Type: Elective
9. Course Enrollment Requirements: None




UNIVERSIDAD AUTÓNOMA  
DE BAJA CALIFORNIA  
REGISTRADO  
16 JUN 2021  
DEPARTAMENTO DE APOYO A LA  
DOCENCIA Y LA INVESTIGACIÓN.

Learning Module Design Team

Sign

Approval of Assistant Dean (s)

Sign

Alejandra Ramos González   
Harriet Downey   
Manuel Alejandro Carballo Amador 

Priscilla Elizabeth Iglesias Vázquez

  
UNIVERSIDAD AUTÓNOMA  
DE BAJA CALIFORNIA

Date: Junio 16, 2021

FACULTAD DE CIENCIAS



## **II. PURPOSE OF LEARNING MODULE**

The aim of this course is to introduce students to basic concepts of conservation biology and help them understand the importance of integrating scientific evidence into conservation and decision-making. This course highlights that the failure to consider scientific evidence reduces the effectiveness of management actions. Evidence-Based Conservation is an elective course offered in the Biology Program at a terminal level in the area of Natural and Exact Sciences; no prerequisite courses are required for enrollment. Students need to be proficient in English.

## **III. COMPETENCE OF THE LEARNING MODULE**

To integrate scientific evidence into conservation and decision-making, through data synthesis, experimental designs, meta-analyses, and web resources, to increase the effectiveness of management plans, with a critical attitude and respect for the environment.

## **IV. EVIDENCES OF LEARNING/ACHIEVEMENT**

Students will develop a management plan that integrates evidence-based practices, which they will present in written form, and in oral presentation.

**V. UNIT DESCRIPTION**  
**UNIT 1. Conservation foundations**

**Competency:**

To analyze the core principles of conservation, through literature review and research, to understand the importance of biodiversity and identify the main threats to plant and animal species, with discipline and respect.

**Content:**

**Time Allotted: 8 hours**

- 1.1 The state of our planet
- 1.2 The emergence of conservation biology
- 1.3 Genetic diversity
- 1.4 Species, Community and Ecosystem diversity
- 1.5 Biodiversity and ecosystem services
- 1.6 Threats to biodiversity
- 1.7 Conservation of Ecosystems and Landscapes
- 1.8 Stakeholders and interdisciplinary actions

## UNIT II. An introduction to evidence-based conservation

### Competency:

To analyze scientific evidence of plant and animal species, through research and web resources, to identify actions that may increase the effectiveness of management plans, with commitment and integrity.

### Content:

**Time Allotted:** 10 hours

- 2.1 What is scientific evidence and why is it important?
- 2.2 How is scientific evidence used in conservation?
- 2.3 Barriers to scientific evidence
- 2.4 Evidence synthesis
- 2.5 Planning and designing experiments
- 2.6 Translocations and evidence-based conservation
- 2.7 Using the Conservation Evidence website

### UNIT III. Evidence-based conservation tools

**Competency:**

To produce scientific evidence, through research synthesis, systematic review, and meta-analyses, to design management plans that integrate successful actions, with diligence and determination.

**Content:**

**Time Allotted: 14 hours**

- 3.1 The need for research synthesis
- 3.2 Types of research synthesis
- 3.3 Systematic review: the steps
- 3.4 Systematic review: an example
- 3.5 Vote counting
- 3.6 Meta-analysis
- 3.7 Integrating evidence into decision making and management plans

## VI. STRUCTURE OF WORKSHOP PRACTICES

| No.    | Practice Name                            | Procedure  | Support resources  | Time    |
|--------|--|--|--|---------|
| UNIT I |  |  |  |         |
| 1      | Conservation                             | <ol style="list-style-type: none"> <li>1. Listens to the teacher's instructions.</li> <li>2. Analyzes literature</li> <li>3. Answers quiz</li> <li>4. Submits quiz on time</li> </ol>  | <ul style="list-style-type: none"> <li>• Computer</li> <li>• Internet connection</li> <li>• Literature</li> <li>• Blackboard</li> </ul>                              | 2 hours |
| 2      | Why is biodiversity important?           | <ol style="list-style-type: none"> <li>1. Listens to the teacher's instructions</li> <li>2. Analyzes literature</li> <li>3. Answers quiz</li> <li>4. Submits quiz on time</li> </ol>   | <ul style="list-style-type: none"> <li>• Computer</li> <li>• Internet connection</li> <li>• Literature</li> <li>• Blackboard</li> </ul>                              | 2 hours |
| 3      | Importance of ecosystem services         | <ol style="list-style-type: none"> <li>1. Listens to the teacher's instructions</li> <li>2. Analyzes literature</li> <li>3. Posts ideas of the importance of ecosystem services in online forum</li> <li>4. Uses forum to discuss with peers</li> </ol>  | <ul style="list-style-type: none"> <li>• Computer</li> <li>• Internet connection</li> <li>• Literature</li> <li>• Blackboard</li> </ul>                              | 2 hours |
| 4      | Main threats to plant and animal species | <ol style="list-style-type: none"> <li>1. Listens to the teacher's instructions</li> <li>2. Uses google scholar to research endangered plant and animal species.</li> <li>3. Makes a list of 10 endangered species.</li> <li>4. Identifies the main risk factors (e.g. habitat loss, poaching, climate change) for each species.</li> <li>5. Submits list of endangered species and main risk factors</li> </ol> | <ul style="list-style-type: none"> <li>• Computer</li> <li>• Internet connection</li> <li>• Google scholar</li> <li>• Excel or Word</li> <li>• Blackboard</li> </ul> | 2 hours |

|                 |   |   |  |         |
|-----------------|---|---|--|---------|
| <b>UNIT II</b>  |   |   |  |         |
| 5               | What is scientific evidence and how is it used in conservation? | <ol style="list-style-type: none"> <li>1. Listens to the teacher's instructions</li> <li>2. Analyzes literature</li> <li>3. Answers quiz</li> <li>4. Submits quiz on time</li> </ol>  | <ul style="list-style-type: none"> <li>• Computer</li> <li>• Internet connection</li> <li>• Literature</li> <li>• Blackboard</li> </ul>  | 2 hours |
| 6               | Planning and designing experiments                              | <ol style="list-style-type: none"> <li>1. Listens to the teacher's instructions</li> <li>2. Works in teams to design an experiment that considers evidence practices</li> <li>3. Presents experimental design to teacher and peers</li> </ol>   | <ul style="list-style-type: none"> <li>• Computer</li> <li>• Internet connection</li> <li>• Literature</li> <li>• Power Point Slides</li> <li>• Blackboard</li> </ul>  | 2 hours |
| 7               | Translocation of endangered species                             | <ol style="list-style-type: none"> <li>1. Listens to the teacher's instructions</li> <li>2. Analyzes literature</li> <li>3. Answers quiz</li> <li>4. Submits quiz on time</li> </ol>  | <ul style="list-style-type: none"> <li>• Computer</li> <li>• Internet connection</li> <li>• Literature</li> <li>• Blackboard</li> </ul>  | 2 hours |
| 8               | Evidence synthesis and actions                                  | <ol style="list-style-type: none"> <li>1. Listens to the teacher's instructions</li> <li>2. Works in teams to complete exercises on the Conservation Evidence Website</li> <li>3. Individually, searches for evidence of successful and non-successful actions for each endangered species included in workshop #4's list</li> <li>4. Adds actions to list</li> </ol> | <ul style="list-style-type: none"> <li>• Computer</li> <li>• Internet connection</li> <li>• Conservation Evidence Website</li> <li>• Endangered species list from workshop #4</li> <li>• Blackboard</li> </ul> | 4 hours |
| <b>UNIT III</b> |   |   |  |         |
| 9               | Systematic review   | <ol style="list-style-type: none"> <li>1. Listens to the teacher's instructions</li> <li>2. Analyzes literature examples</li> <li>3. Works in teams to complete a systematic review</li> <li>4. Produces scientific evidence</li> </ol>   | <ul style="list-style-type: none"> <li>• Computer</li> <li>• Internet connection</li> <li>• Literature</li> <li>• Conservation Evidence Website</li> </ul>   | 4 hours |

|    |   |   |  |         |
|----|---|---|--|---------|
|    |   | <ol style="list-style-type: none"> <li>5. Applies statistics for validation</li> <li>6. Identifies general patterns and research gaps</li> </ol>  | <ul style="list-style-type: none"> <li>• Blackboard</li> </ul>   |         |
| 10 | Exercise: Does delaying the first mowing date benefit biodiversity in meadowland? | <ol style="list-style-type: none"> <li>1. Listens to the teacher's instructions</li> <li>2. Analyzes literature examples</li> <li>3. Works in groups to complete exercises in R statistical software</li> <li>4. Submits exercises on time</li> </ol>   | <ul style="list-style-type: none"> <li>• Computer</li> <li>• Internet connection</li> <li>• Literature</li> <li>• Conservation Evidence Website</li> <li>• R statistical software</li> <li>• Blackboard</li> </ul> | 4 hours |
| 11 | Design of a management plan integrating scientific evidence                       | <ol style="list-style-type: none"> <li>1. Listens to the teacher's instructions</li> <li>2. Works in teams to design a written management plan</li> <li>3. Integrates produced scientific evidence of successful actions</li> <li>4. Presents management plan in written form, and in oral presentation to teacher and peers</li> </ol> | <ul style="list-style-type: none"> <li>• Computer</li> <li>• Internet connection</li> <li>• Literature</li> <li>• Conservation Evidence Website</li> <li>• Power point slides</li> <li>• Blackboard</li> </ul>     | 6 hours |



## VII. METHODOLOGY AND STRATEGIES

**Course framework:** The first day of class the teacher must establish the form of work, evaluation criteria, quality of academic work, rights and obligations for teacher and students.

### **Teaching strategies (teacher):**

- Theory classes in classroom and/or video conference
- Provide literature, web resources, and case studies
- Training for the use of statistical software and Conservation Evidence Website
- Promote group work through peer review activities
- Use of quizzes, debates, discussions, online videos, and related tools to enhance learning

### **Learning strategies (student):**

- Review and study class material
- Provide feedback to other students in group activities
- Participate in class and in online forums
- Deliver activities within the time limit
- Generate scientific evidence and perform a meta-analyses
- Create an evidence-based management plan
- Give oral presentation of management plan to the whole group

## VIII. EVALUATION CRITERIA

The evaluation will be carried out permanently during the development of the course as follows:

### Accreditation criteria

To be entitled to ordinary and extraordinary exam, the student must meet the attendance percentages established in the current School Statute.

Scaled from 0 to 100, with a minimum approval of 60.

### Assessment criteria

- Partial evaluations (3).....45%
- Workshop Activities.....20%
- Management plan submitted in written form.....25%
- Oral presentation of management plan.....10%
- Total.....100%**

## IX. Bibliography

| Required   | Suggested   |
|--|---|
| <p>Christie, A.P., Amano, T., Martin, P.A., Shackelford, G.E., Simmons, B.I. &amp; Sutherland, W.J. (2019). Simple study designs in ecology produce inaccurate estimates of biodiversity responses. <i>Journal of Applied Ecology</i>, 56, 2742-2754.</p> <p>Cook, C. N., Hockings, M., &amp; Carter, R. W. (2010). Conservation in the dark? The information used to support management decisions. <i>Frontiers in Ecology and the Environment</i>, 8(4), 181-186.</p> <p>Dicks, L.V., Hodge, I., Randall, N., Scharlemann, J.P.W., Sirwardena, G.M., Smith, H.G., Smith, R.K. &amp; Sutherland, W.J. (2014). A transparent process for 'evidence-informed' policy making. <i>Conservation Letters</i>, 7(2), 119–125.</p> <p>Fabian, Y., Bollmann, K., Brang, P., Heiri, C., Olschewski, R., Rigling, A., Holderegger, R. (2019). How to close the science-practice gap in nature conservation? Information sources used by practitioners. <i>Biological Conservation</i>, 235, 93-101.</p> <p>Salatsky, N., Boshoven, J., Burivalova, Z., Dubois, N. S., Gomez, A., Johnson, A., Lee, A. &amp; Pratt, S. C. (2019). Defining and using evidence in conservation practice. <i>Conservation Science and Practice</i>, 1(5), e27.</p> <p>Walsh, J.C., Dicks, L.V., Raymond, C.M., Sutherland, W.J. (2019). A typology of barriers and enablers of scientific evidence use in conservation practice. <i>Journal of Environmental Management</i>, 250(109481).</p> | <p>British Ecological Society (s.f.). <i>Ecological Solutions and Evidence</i>. Recuperado de <a href="https://besjournals.onlinelibrary.wiley.com/journal/26888319">https://besjournals.onlinelibrary.wiley.com/journal/26888319</a></p> |

## X. TEACHER PROFILE

The teacher for this course must have a graduate degree, preferably a PhD, in Biology, Environmental Sciences, or a related field, research or teaching experience in conservation, and a strong knowledge of statistics and R. Ideally, she or he will be diligent, reliable, and respectful.