

Laboratory Exercises 9

ECOLOGY

Introduction

The structure and dynamics of a community also depend on the feeding relationships between organisms—the *trophic structure* of the community. The transfer of food energy up the trophic levels from its source in plants and other autotrophic organisms (primary producers) through herbivores (primary consumers) to carnivores (secondary, tertiary, and quaternary consumers) and eventually to decomposers is referred to as a *food chain*. Food chains are relatively short and this is attributed either to the inefficiency of energy transfer along the chain (*energetic hypothesis*) or the instability of long food chains (*dynamic stability hypothesis*). Food chains are not isolated units but are linked together in *food webs*. Ecologists summarize the trophic relationships of a community by diagramming a food web with arrows linking species according to who eats whom.

Expected Learning Outcomes

After accomplishing the exercise, the student can:

1. explain how the energy flows and how matter is recycled in an ecosystem.



Activities

Examine a sample food chain, construct a food chain, food web and energy pyramid and explain energy transfer in trophic levels

- Using the following food chain (Fig 1), answer the questions below.
 1. What type of organism is the grass?
 2. Which animal is an herbivore or primary consumer?
 3. What would happen to the population of snakes if the population of hawks increased? Why?
- Construct a food chain for the following: *An owl eats a snake, the snake eats a frog, the frog eats a grasshopper, and the grasshopper eats the plant.* Label the producer, primary consumer, secondary consumer, tertiary consumer, and the highest consumer.
- Using the food chain from question no. 2, construct an energy pyramid.
 1. Which animal has the most amount of available energy?
 2. Which animal has the least amount of available energy?



Figure 1. Food chain

Ecology Lab Exercises

Robert W. Kingsolver



Ecology Lab Exercises:

Laboratory Exercises for Freshwater Ecology John E. Havel, 2016-03-17 Limnology stream ecology and wetland ecology all share an interdisciplinary perspective of inland aquatic habitats Scientists working in these fields explore the roles of geographic position physical and chemical properties and the other biota on the different kinds of plants and animals living in freshwaters How do these creatures interact with each other and with their physical environment In what ways have humans impacted aquatic habitats By what methods do freshwater ecologists study these environments With this new laboratory manual Havel provides a variety of accessible hands on exercises to illuminate key concepts in freshwater ecology These exercises include a mixture of field trips indoor laboratory exercises and experiments with some portions involving qualitative observations and others more quantitative With the help of this manual students will develop an appreciation for careful techniques used in the laboratory and in the field as well as an understanding of how to collect accurate field notes keep a well organized lab notebook and write clear scientific reports Laboratory Exercises for General Ecology and Evolution Carl Freeman, Kathleen Miglia, Hang Wang, 1999-08

Wildlife Ecology Susan Bratton, 2011-08-04

Ecology-Lab. Activities Manual Glencoe, 2004-08-01 **Ecology on Campus** Robert W. Kingsolver, 2006 This flexible laboratory manual contains nearly 60 exercises involving small scale ecological systems that can be conducted within a weekly lab period right on campus regardless of the weather or resources available Each chapter describes an ecological concept and provides a choice of exercises involving outdoor observation and measurement hands on modeling small scale laboratory systems biological collections problem sets or computer based analyses In order to help build quantitative and critical thinking skills record sheets graphs and calculation pages are provided as needed for in class data analysis Question sets are provided in each chapter and computer step by step instructions walk through standard mathematical models and commonly used statistical methods Suggestions for further investigation present each topic as an open ended subject of inquiry Book cover

Field and Laboratory Exercises in Ecology Stephen D. Wratten, Gary L. A. Fry, 1980 *Ecology Lab and Field* Kausalya Shenoy, Philip Crowley, 2015-08-21 Laboratory Exercises in Physiological Ecology John Mark Dean, 1975*

Hands-On Chemical Ecology: Dietland Müller-Schwarze, 2009-08-15 Hands On Chemical Ecology Simple Field and Laboratory Exercises a premiere collection of practical exercises in chemical ecology offers tools and strategies for understanding this young science The exercises included use general principles and follow a simple structure Topics examined include birds fish insects mammals and plant chemistry among others Additionally exercises require accessible materials ensuring that each can be easily modified and completed anywhere in the world with locally existing instruments This text will be of value to undergraduate and graduates students and high school biology teachers Resources in Education, 1972 **Research in Education**, 1972-05 Biological Environmental Science William V Dashek, 2019-04-29

Biological Environmental Science is an introductory textbook for undergraduate students who desire a one semester course

or alternatively a springboard course for advanced environmental offerings This book features timely issues such as global warming air ground and water pollutions population growth species extinction and environmental poli *Catalogue of the Sheffield Scientific School of Yale University for the College Year ...* Yale University. Sheffield Scientific School,1914

University of Illinois Bulletin ,1910 **Cornell University Courses of Study** Cornell University,2005 *Field and Laboratory Exercises in Animal Behavior* Chadwick V. Tillberg,Michael D. Breed,Sarah J. Hinnners,2007-09-04 Field and Laboratory Exercises in Animal Behavior is an interactive laboratory manual for students in animal behavior ethology and behavioral ecology It is the first of its kind in this subject area that guides students through the diverse and fascinating fields of behavioral and ethological studies employing a wide array of organisms as model systems for the study of behavior Students participate in the development of hypothesis and turn the recording analysis and interpretation of data into an active and engaging process A teacher friendly companion website provides extensive teaching notes on the background to each lab project tips and hints for successful project presentation sources for studying organisms ideas for variations in labs and alternate study organisms This text is recommended for undergraduate courses in Animal Behavior Ethology and Behavioral Ecology Provides fully developed and tested laboraty exercises Offers both field and lab experiences adaptable for fall spring or summer courses Laboratories emphasize student thought and involvement in experimental design Includes an online supplement to the manual for teachers University Catalogue Yale University,1912 **Ecology Lab Manual** UNIVERSITY OF NORTH. TEXAS,University Of North,2021-08-30 Catalogue of the Officers and Graduates of Yale University Yale University,1916 *Catalogue of the Officers and Students in Yale College* Yale University,1912

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Table of Contents Ecology Lab Exercises

1. Understanding the eBook Ecology Lab Exercises
 - The Rise of Digital Reading Ecology Lab Exercises
 - Advantages of eBooks Over Traditional Books
2. Identifying Ecology Lab Exercises
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an Ecology Lab Exercises
 - User-Friendly Interface
4. Exploring eBook Recommendations from Ecology Lab Exercises
 - Personalized Recommendations
 - Ecology Lab Exercises User Reviews and Ratings
 - Ecology Lab Exercises and Bestseller Lists
5. Accessing Ecology Lab Exercises Free and Paid eBooks
 - Ecology Lab Exercises Public Domain eBooks
 - Ecology Lab Exercises eBook Subscription Services
 - Ecology Lab Exercises Budget-Friendly Options

6. Navigating Ecology Lab Exercises eBook Formats
 - ePub, PDF, MOBI, and More
 - Ecology Lab Exercises Compatibility with Devices
 - Ecology Lab Exercises Enhanced eBook Features
7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Ecology Lab Exercises
 - Highlighting and Note-Taking Ecology Lab Exercises
 - Interactive Elements Ecology Lab Exercises
8. Staying Engaged with Ecology Lab Exercises
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Ecology Lab Exercises
9. Balancing eBooks and Physical Books Ecology Lab Exercises
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Ecology Lab Exercises
10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
11. Cultivating a Reading Routine Ecology Lab Exercises
 - Setting Reading Goals Ecology Lab Exercises
 - Carving Out Dedicated Reading Time
12. Sourcing Reliable Information of Ecology Lab Exercises
 - Fact-Checking eBook Content of Ecology Lab Exercises
 - Distinguishing Credible Sources
13. Promoting Lifelong Learning
 - Utilizing eBooks for Skill Development
 - Exploring Educational eBooks
14. Embracing eBook Trends
 - Integration of Multimedia Elements

- Interactive and Gamified eBooks

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