

THE AMERICAN BIOLOGY TEACHER



About Our Cover

The Canada lynx (*Lynx canadensis*) is a medium-sized, short-bodied, stubby-tailed, long-legged member of the family Felidae. It is often confused with its close cousin the bobcat (*L. rufus*).

The lynx is an apex predator whose diet consists primarily of snowshoe hare (they eat one hare every one to two days), especially when hares are abundant. When hare densities drop, the lynx's diet can include red squirrels, grouse, ptarmigan, and other birds, as well as small mammals like squirrels, voles, and mice. Lynx are good swimmers and climbers but appear to hunt predominantly on the ground.

Lynx generally mate between March and April, and kittens are born from May to July, depending on latitude. Litter sizes of one to several kittens vary with prey availability and appear to be tied to what has become known as the 10-year lynx-hare cycle, a renowned predator-prey cycle that is taught in all general ecology courses. The amplitude of the cycle is at its highest in northern boreal forests and appears less pronounced on the southern periphery of their range. Individuals may live up to 15–16 years, but ~10 years is more common.

The Canada lynx likely descended from the Eurasian lynx when that cat invaded North America ~200,000 years ago. Lynx are currently well known and widely distributed throughout dense boreal forests of Alaska and Canada, but only throughout some of the more northern contiguous U.S. states, where they are threatened with habitat loss. Home range sizes for lynx vary widely, depending on many factors (primarily prey abundance), but are known to range from tens to hundreds of square kilometers. Lynx are still trapped for their fur in Canada and Alaska, but trapping is restricted in the lower 48 states. *Lynx canadensis* is classified by the International Union for Conservation of Nature as of "least concern" but is listed locally by some states and provinces as threatened or endangered.

Roy Rea, a Biology Instructor at the University of Northern British Columbia, captured this photo while photographing grouse near Quesnel, BC, on a frosty, fall day with a Canon 5D Mark 3 and a Canon 300mm/2.8 lens and 2x extender.

Contents

Feature Article

How to Build a Super Predator: From Genotype to Phenotype

Using a drawing discovery lab that crosscuts multiple disciplines in biology and links concepts in genetics and evolutionary thinking to enhance understanding of the genotype-phenotype transformation

Caryn Babaian, Sudhir Kumar 138

An Instant Update on Viruses

Reviewing what viruses are, how they are distinct from bacteria, how they may have evolved, and how diseases they cause may be prevented

Uwe K. Simon 147

Available online at <https://www.nabt.org/ABT-Online-Current-Issue>

Research on Learning

Using English as the Language of Science: An International Peer Video Exchange on Ecology

Developing and testing a content-based video exchange model as a motivating means to introduce lower secondary English learners to English as the language of science

Nina Meyerhöffer, Daniel C. Dreesmann 154

Inquiry & Investigation

An Interactive & Cooperative Activity for Exploring Animal Systematics Using Cards & String

Using a cooperative, low-stakes, inexpensive method for novice students to organize hierarchical information

Christopher G. Brown 161

How Do Scientists Know? Answering High School Students' Questions with an Ecological Sampling Unit

Using lessons describing six ecological scenarios that demonstrate how scientists arrive at answers to population ecology questions

Lisa A. Pike 165

Plant Disease & Climate Change: A Classroom Exercise Emphasizing Scientific Collaboration

Providing college students experience in synthesizing information and developing a solution while addressing socioscientific issues across fields

Alexandra M. Shigenaga, Gretchen E. Kroh, Cristiana T. Argueso 174

Testing Mosquitoes for Student Inquiry: Husbandry Lessons in the Lab

Housing mosquitoes and creating plant extracts for student inquiry to successfully increase public health research regarding mosquitoes

Erica Kosal, Beverly I. Anaele 180

Tips, Tricks & Techniques

Using Visuals to Help Explain Tonicity to Introductory Biology Students

Boosting student understanding of tonicity and osmolarity through a simple, hands-on, and inexpensive visual exercise

Brian Rafferty, Lalitha Jayant 185

3D Printing of Human Microbiome Constituents to Understand Spatial Relationships & Shape Parameters in Bacteriology

Using modeling to provide tactile and practical demonstration of scale and shape concepts

Jacques Izard, Teklu Kuru Gerbaba, Shara R. P. Yumul 188

Considering Instructional Approach & Question Design with the Hardy-Weinberg Principle

Evaluating pervasive misconceptions of the Hardy-Weinberg Principle in university and AP-level education and examining possible solutions

Robert J. Driver, Susan B. McRae 191

Departments

Guest Commentary • Rethinking the High School Biology Curriculum • Erik Mohlhenrich 135

Letter From the Editor • 2020 Thank You • William McComas, Editor-in-Chief 136

Book Review • Amanda L. Glaze-Crampes, Department Editor 195

Classroom Materials & Media Review • Jeffrey Sack, Department Editor 197

Sacred Bovines • The Facts of Science & the Values of Social Justice • Douglas Allchin 199

