



## **2020 Colorado School of Mines Classes Available through RMC**

**Unless otherwise noted all classes are worth .5 credits with 8 hours of class time.**

Level I: Short-distance walks on maintained trails and/or indoor classroom sessions in accessible buildings ♦

Level II: Short-distance walks through the day on primarily level terrain ♦♦

Level III: Moderate hikes of less than five miles per day with elevation gain of less than 1,000 ft. ♦♦♦

Level IV: Hikes of more than five miles per day with elevation gain of more than 1,000 ft. ♦♦♦♦

### **Natural History Classes:**

#### **Coyotes: Song Dogs of the West**

**Jared Gricoskie March 21 \$80 per adult ages 16 and older**

Coyotes are among this country's most successful and resourceful predators. Often misunderstood and maligned, the coyote's impact on our everyday life is profound. Explore the natural history of North America's second largest canine, Native American stories, coyote discovery by Lewis and Clark, and the animal's expansion to the East. Examine the coyote's anatomy and biology; then, head into Rocky Mountain National Park to explore coyote habitat, social structure, and interactions. Learn how the coyote interacts with the ecosystem, its prey and humankind, and how wolves could impact coyotes in the future.

♦♦ (CSM credit available) Meets at the Rocky Mountain Conservancy Field Institute

#### **North with the Spring: Bird Migration**

**Jeff Maugans May 1 \$80 per adult ages 16 and older**

May in the high country is when we welcome back birds that have wintered in warmer climates. Ducks, shorebirds, warblers, swallows, flycatchers, sparrows, sapsuckers, bluebirds, and many others return for the nesting season or stop to refuel before heading farther north. Explore several locations in and around Estes Park and Rocky Mountain National Park to identify as many species as possible by sight and sound while learning about each bird's unique natural history. ♦♦♦ (CSM credit available) Meets at the Rocky Mountain Conservancy Field Institute

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### **Fire in Ecosystems: Friend or Foe**

**Scott Franklin May 9 \$80 per adult ages 16 and older**

Both managers and citizens are grappling with the complexity of how climate change may alter fire disturbance regimes. Is fire still a natural disturbance in these mountain forests? What relationship does fire have with other disturbances such as drought and bark beetle outbreaks? During this all-day class, we will explore the role of fire in mountain forest ecosystems, typical fire regimes, synergistic disturbances, and predicted changes with climate warming. We will also discuss the history of fire policy ranging from the “10 am policy” to the “let burn policy”, including the caveat of the wildland-urban interface. ♦♦ (CSM credit available) Meets at the Rocky Mountain Conservancy Field Institute

### **Endangered Species of the Rockies: Evading Extinction**

**Gary C. Miller May 15 \$80 per adult ages 16 and older**

Concerned about threatened or endangered species, and their preservation as part of our natural world? How do species come to be at the brink of extinction, and how can they be recovered? The answers lie in the landmark Endangered Species Act of 1973 (ESA), the emerging science of conservation biology, and the resulting actions taken by scientists and citizens. Using examples of species occurring in Rocky Mountain National Park, this class will delve into these topics and their application in recovery efforts. The case histories (including little-known “backstories”) of efforts to recover peregrine falcons, Canada lynx, North American wolverine, and greenback cutthroat trout each demonstrate different aspects of endangered species management. The class includes a visit to a nesting area of the once-endangered/now-recovered peregrine falcon.

♦♦ CSM credit available Meets at the Rocky Mountain Conservancy Field Institute

### **There’s More to This Place than Meets the Eye: 100 Years of Environmental Change in RMNP**

**DeAnna Laurel May 22 \$80 per adult ages 16 and older**

This course provides an overview of the history of environmental change in the park with an emphasis on human-caused change. Discuss the history of mining, water engineering, recreational development and tourism, atmospheric inputs of dust and nitrates, wildlife management, and climate change in the context of protecting and restoring natural environments within the park. Understand how past human activities influence contemporary ecosystems and options for management of natural resources within the park. ♦♦ CSM credit available Meets at the Rocky Mountain Conservancy Field Institute

### **Owls of Rocky Mountain National Park**

**Jeff Maugans May 22 \$80 per adult ages 16 and older**

Participants will explore Rocky Mountain National Park in search of 3-4 species of owls during the spring courtship and nesting season. Students will be listening for the vocalizations of Northern Pygmy, Northern Saw-whet, Flammulated, and Great Horned Owls. The group will head into the field well before dark as Pygmy Owls are diurnal which provides a great opportunity to get great looks at this species. After dark participants will listen for the other species and hopefully locate a nesting pair or two while seeing first-hand the habitats these species require. ♦♦ CSM credit available Meets at the Rocky Mountain Conservancy Field Institute

### **The Surprising World of Lichens**

**Jennifer Frazer May 30 \$80 per adult ages 16 and older**

You cannot hike, bike, climb, or ski in Colorado without encountering lichens, but few people take the time to notice or examine these ubiquitous organisms. Come take your blinders off and be blown away by the biology and beauty of these fascinating communities of organisms that live where other life forms cannot. In this class you’ll learn about the inhabitants, anatomy, growth forms, and reproductive structures of lichens. You should invest in a 10X hand lens or loupe to maximize your enjoyment. Artists and photographers welcome! ♦♦♦ (CSM credit available) Meets at the Field Institute

### **Birding RMNP by Ear**

**Nathan Pieplow May 31 \$80 per adult ages 16 and older**

Birds are far more often heard than seen – but learning to identify them by ear can be a challenge. This course will introduce the most common bird sounds of Rocky Mountain National Park. We will begin with a field trip in the morning to several different habitats, to hear and practice identifying as many birds as possible. In the afternoon, we will reconvene indoors for a class session to reinforce and extend the learning from the morning. Both indoors and out, we will work on learning a standard vocabulary for describing sounds, and visualizing sound using spectrograms, so that our eyes can help train our ears.

♦♦ CSM credit available Meets at the Rocky Mountain Conservancy Field Institute

### **NEW! Hunters of the Wind: Eagles, Hawks, & Falcons**

**W. Perry Conway June 5 \$80 per adult ages 16 and older**

Eagles, hawks, and falcons are icons of power and speed that capture the human imagination. Rocky Mountain National Park has all three of these aerial athletes. With an illustrated lecture/discussion in the morning followed by an afternoon field trip, participants will learn how these beautiful birds are alike and different with respect to their diet and nesting requirements, behavior, evolution, and population status. Nesting areas will also be viewed from a safe distance and live birds will be presented as part of the lecture/discussion. ♦♦ CSM credit available Meets at the Rocky Mountain Conservancy Field Institute

### **Early Wildflowers of RMNP**

**Leanne Benton June 6 \$80 per adult ages 16 and older**

Some of the park's early blooms are the loveliest, from tiny alpine forget-me-nots to colorful Calypso orchids. Search out these beauties with former Rocky Mountain National Park interpretive naturalist Leanne Benton as we explore from high alpine ridges to lower montane meadows depending on what is blooming. Participants will get up-close with the mountain flora to discover their adaptations for survival and interesting stories behind their beautiful faces. Identification techniques will be honed, and participants will gain confidence using a simple flower key. ♦♦ CSM credit available Meets at the Rocky Mountain Conservancy Field Institute

### **Rocky Mountain National Park Butterflies: East of the Divide**

**Paul Opler & Evi Buckner-Opler June 6 \$80 per adult ages 16 and older**

Butterflies are easily observed in every life zone of Rocky Mountain National Park. Learn basic butterfly biology, behavior, and identification. In the field, visit several different habitats on the east slope of the park to search for summer species, such as pale swallowtail, blues, several fritillaries, hoary comma, and Weidemeyer's admiral. Learn to identify these species, and also discuss their life histories and ecology, host-plant associations and conservation concerns. Observation will rely on binoculars and digital photography; however, the primary instructor will have a net-and-release permit to allow participants a close-up look at a variety of species. ♦♦ CSM credit available. Meets at the Rocky Mountain Conservancy Field Institute

### **NEW! Spring Mushrooms & Fungi of RMNP**

**Jon Sommer June 7 \$80 per adult ages 16 and older**

Come learn the basics for identifying fleshy fungi (including mushrooms), their important role in the ecosystem, and a brief overview of the fungal kingdom. Rocky Mountain National Park has some unique and pristine ecosystems that we will explore, including the areas near snowbanks. We will spend a good part of the day in the field, identifying mushrooms and other fungi, and gaining a first-hand appreciation of these interesting and important organisms. There will be particular emphasis on the Cup Fungi (ascomycetes), including Morels and their allies. ♦♦ CSM credit available Meets at the Rocky Mountain Conservancy Field Institute

### **Untangling the Mystery of RMNP Native Orchids**

**Marlene Borneman June 13 \$80 per adult ages 16 and older**

What is an Orchid? The orchid family (Orchidaceae) is the largest family of flowering plants, about 35,000 species. Surprisingly there are about 26 species native to Colorado with many growing in the

montane and subalpine zones of RMNP. Our day includes learning the characteristics of the Orchid family, Orchid terminology, their symbiotic relationship to other plants, history of uses, and looking at specific Orchid species found in RMNP. We will see how many species we can find and identify in the field, while enjoying these elusive and mysterious plants.

♦♦ CSM credit available Meets at the Rocky Mountain Conservancy Field Institute

### **Wildflowers of RMNP**

**Leanne Benton June 27-28 \$160 per adult ages 16 and older for both days or \$90 for each day**

Explore the wonder and diversity of the park's wildflowers with a former Rocky Mountain National Park interpretive naturalist. The park's vertical topography allows for variety of habitats; this class will search out lush wildflower displays from montane meadows to high alpine ridges. Get up-close with the mountain flora to discover their adaptations for survival and interesting stories behind their beautiful faces. Hone identification techniques, and gain confidence using a flower key. Day 1: montane and subalpine wildflowers; Day 2: alpine wildflowers. ♦♦ CSM credit available Meets at the Rocky Mountain Conservancy Field Institute **This class has over 16 hours of contact time for 1 credit.**

### **Birding the Life Zones**

**Jeff Maugans June 27-28 \$160 per adult ages 16 and older**

Rocky Mountain National Park is a birder's paradise during the nesting season. This two-day class will explore the various ecosystems (life zones) of the park to find 50-70 bird species. We will identify hawks, falcons, eagles, ducks, white-tailed ptarmigans, brown-capped rosy-finches, swifts, broad-tailed hummingbirds, swallows, tanagers, sparrows, warblers, American dippers, wrens, woodpeckers, owls, nuthatches, chickadees, kinglets, jays, common ravens and other corvids, and a number of other members of the area's avifauna. We will discuss the natural history of both the birds and the montane, subalpine, alpine, and riparian environments they inhabit. ♦♦ CSM credit available Meets at the Rocky Mountain Conservancy Field Institute **This class has over 16 hours of contact time for 1 credit.**

### **NEW! The Amazing Alpine Tundra: A Land of Extremes**

**Cynthia Langguth July 10 \$80 per adult ages 16 and older**

"The combination of heavy snowfall, bitter wind, low temperatures, and mountainous topography in alpine areas creates the most severe climate in the world," writes alpine researcher Joyce Gellhorn in her book *Song of the Alpine*. Yet among these extremes, a surprising diversity of life has found ways to survive and thrive. This course will explore the climate and topography that combine to shape this incredible ecosystem, and the amazing strategies alpine plants and animals use to make this their home.

♦♦ CSM credit available Meets at the Rocky Mountain Conservancy Field Institute

### **North American Bears: Ecology, Behavior & Evolution**

**W. Perry Conway July 11 \$80 per adult ages 16 and older**

Bears are the iconic symbol of the American wilderness. North America has three of the world's eight species. Historically, the park had two of the three – now only one. Learn the natural history of all three North American species – their evolution, behavior, and habitat needs. With illustrated classroom sessions and field trips, you will learn which areas of the park provide proper black bear habitat, what they eat and their population status. In addition, instruction as to where to view and safely photograph North American bears will be provided. ♦♦ CSM credit available Meets at the Rocky Mountain Conservancy Field Institute

### **NEW! Rocky Mountain Riparian Plant Ecology, Identification, & Physiology**

**Isabel Schroeter July 11 \$80 per adult ages 16 and older**

Riparian (streamside) ecosystems are hotspots for biodiversity and human recreational activities. In addition to these functions, riparian ecosystems provide a unique opportunity to better our scientific understanding about the intersection of plant ecology, hydrology, and ecological restoration. This interplay has become increasingly relevant to Rocky Mountain National Park due to management interests in restoring tall, dense willow-dominated plant communities following intense elk and moose

browsing and beaver decline. This course will focus on teaching students about the identification of common riparian plants (e.g., willows, alders, birches, sedges) in addition to teaching students about physiological approaches used in the plant sciences to assess plant responses to environmental factors. The activities in this course will be contextualized in National Park Service riparian management and restoration efforts by showcasing these scientific approaches at multiple study sites of varying ecological condition. ♦♦♦ *Meets at the Field Institute*

### **Glaciers in Rocky**

**Dr. David Lindsey July 18 \$80 per adult ages 16 and older**

During the ice ages, glaciers moved down the valleys of the Fall River and the Big Thompson. Glaciers carved U-shaped cross sections into formerly narrow stream valleys and left natural dams of glacial debris at their terminus. Striated and grooved bedrock, glacial erratics, and ridges of debris along valley walls are some of the other calling cards of ice. The ebb and flow of glacial advance is controlled by astronomical phenomena: the eccentricity of the earth's orbit, the tilt of the earth's axis of rotation, and the precession of the equinoxes. These move in cycles that combine to produce glacial maxima about every 100,000 years. The last glacial maximum was about 21,000 years ago. Since that time, the earth has warmed, not steadily, but in fits and starts that reflect other complex but poorly understood processes. Today all of these natural processes are further affected by man's activities. The class will examine classical glacial features in the Fall River and Big Thompson valleys and discuss the processes that formed them. ♦♦ CSM credit available *Meets at the Rocky Mountain Conservancy Field Institute*

### **Bats of Colorado & RMNP**

**Jeremy Siemers July 24 \$80 per adult ages 16 and older**

Colorado is home to 19 bat species, and 8 are found in the vicinity of Rocky Mountain National Park. The evolution, ecology, behavior, anatomy, threats, and population status of Colorado's bats will be discussed. Examples of survey equipment, video, and acoustic materials will be used to reinforce the lecture's content. After dinner, we will travel to nearby foraging habitat to observe and listen to bat activity. We will drive as close as possible to the field sites, but participants should come prepared for short hikes. ♦♦ CSM credit available *Meets at the Rocky Mountain Conservancy Field Institute*

### **Bighorn Sheep: Ecology & Management**

**Jeff Connor July 25 \$80 per adult ages 16 and older**

The bighorn sheep is the rightful symbol of Rocky Mountain National Park and the state of Colorado. It is one of the most highly esteemed mammals in North America, representing the majestic mountains of the park. There are few people, who are not impressed by the sight of a large bighorn ram bearing its crown of massive horns. Spend a day with naturalist Jeff Connor learning about the ecology, population dynamics, behavior, food habitats, and mortality causes of bighorn sheep. Learn how to identify a ram from a ewe, a yearling from a lamb, and how to age rams by rings on their horns. Participants will discuss the importance of escape terrain and where ewes have their lambs. The class will also visit two mineral licks, learning why they are so important to the survival of sheep and Jeff will discuss important park management issues related to bighorn sheep. ♦♦♦ CSM credit available

*Meets at the Rocky Mountain Conservancy Field Institute*

### **NEW! Grasses of RMNP**

**Denise Culver July 25-26 \$160 per adult ages 16 and older**

Grass identification is difficult even for the professional botanist! Why even bother?! The grass family is the third largest family in the world, species occupy every continent, and grasses are one of the most important aspects in all of human civilization! The class will focus on the characteristics for each tribe (grass family is so big, it is divided into tribes) common in Rocky Mountain National Park. There will be a classroom component, but majority of the class will be outside. ♦♦ *Meets at the Field Institute This class has over 16 hours of contact time for 1 credit.*

### **NEW! Wetland Plants of RMNP**

**Denise Culver August 1 \$80 per adult ages 16 and older**

If terms like catkins or perigynia intimidate yet intrigue you—come join us to explore the common wetland plants of Rocky Mountain National Park. The class will focus on the characteristics for common wetland plant families in Rocky Mountain National Park. There will be a classroom component, but majority of the class will be outside. ♦♦ **Meets at the Field Institute**

### **The Persevering Pika: Secrets of Alpine Survival**

**Chris Ray August 1 \$80 per adult ages 16 and older**

Watch the American pika demonstrate its alpine survival strategy. Pikas and their hibernating neighbors—yellow-bellied marmots, chipmunks and squirrels—are easy to watch in the summer and fall as they forage among the alpine wildflowers. Learn to spot different animal behaviors that provide clues to surviving the long, cold winter. Pikas don't hibernate, so you're sure to learn a few survival tips from these resourceful little beasts. ♦♦ **CSM credit available**

**Meets at the Rocky Mountain Conservancy Field Institute**

### *Grand Lake Area Class*

#### **Wild Mushrooms & Fungi of RMNP**

**Jon Sommer August 8 \$80 per adult ages 16 and older**

Often thought of as something to be avoided, fungi (including mushrooms) represent a vast and diverse group of organisms that play a critical role in virtually every terrestrial environment on the planet. Formerly thought of as plants, it is now known that fungi represent their own kingdom, along with plants and animals. Exemplified by prevalent and often colorful mushrooms, Rocky Mountain National Park has a bountiful and diverse fungal flora. Come learn the basics of mushroom identification, their important role in the ecosystem and a brief overview of the fungal kingdom. We will spend a good part of the day in the field, identifying mushrooms and other fungi, and gaining a first-hand appreciation of these interesting and important organisms. ♦♦ *(CSM credit available) Meets at Trail River Ranch*

### *Grand Lake Area Class*

#### **The History of Moose in RMNP**

**Jeff Connor August 15 \$80 per adult ages 16 and older**

Before 1978, few if any moose called Rocky Mountain National Park home. In this class, we will discuss the debate around the history of moose in Colorado, as well as where their present population came from. In addition, we'll learn about what they eat, their seasonal behavior, moose management, why some are wearing radio collars, and their impact on the delicate willow communities of the Kawuneeche Valley, as well as their surprising relationships to other organisms in the area. We might even see some moose in the wild! ♦♦♦ **CSM credit available Meets at Trail River Ranch**

### **NEW! Edible & Medicinal Plants of RMNP**

**Leanne Benton August 15 \$80 per adult ages 16 and older**

Spend the day exploring the flora of the park with a retired RMNP interpretive ranger. Not only are the plants diverse and beautiful, many have served as the grocery store and pharmacy for earlier people and are still used today. We will focus on these edible and medicinal species with discussions on plant identification, current and historic usage as food and medicine, preparation techniques, using plants safely, and ethical harvesting and conservation, plus some toxic species to avoid. ♦♦ **CSM credit available Meets at the Field Institute**

### **Mountain Lion: RMNP's Top Predator**

**Caroline Krumm & Dr. Don Hunter August 22-23 \$160 per adult ages 16 and older**

Explore mountain lion ecology, ongoing research, human-mountain lion interaction, and community stewardship of wildlife resources during morning lectures followed by hands-on instruction in the field. Demonstrations of research methods, tools, and data collection will be included with practical instruction on how to "read" the signs left by mountain lions. Mountain lion safety, current research techniques, key management issues, and how communities across the West are becoming involved also will be discussed.

♦♦♦ **CSM credit available Meets at the Rocky Mountain Conservancy Field Institute**

**This class has over 16 hours of contact time for 1 credit.**

### *Grand Lake Area Class*

#### **Rocky Mountain National Park Butterflies: West of the Divide**

**Paul Opler & Evi Buckner-Opler    September 4    \$80 per adult ages 16 and older**

Butterflies are easily observed insects which fly in every life zone of Rocky Mountain National Park. This class will begin with an indoor introduction to basic butterfly biology, butterfly behavior, and butterfly diversity. In the field, we will visit several different habitats on the west side of the Park to search for late summer species, such as Rocky Mountain Parnassian, Scudder's sulphur, silver-bordered fritillary, mourning cloak and dark wood-nymph. We will learn to ID these species and also discuss their life histories, ecology, host-plant associations and conservation concerns, including the impact of loss of lodgepole pine stands to bark beetles. The class will focus on butterfly observation through binoculars and digital photography; however, the primary instructor will have a net-and-release permit to allow participants a close-up look at a variety of species. ♦♦ CSM credit available. Meets at Trail River Ranch.

### **Cultural Classes:**

#### **Phantoms: The Hidden History of RMNP**

**Mary Taylor Young    August 8-9    \$160 per adult ages 16 and older**

What stories hover like phantoms behind the contemporary face of Rocky Mountain National Park? Roam the park with award-winning writer Mary Taylor Young, author of the park's centennial history *Rocky Mountain National Park: The First 100 Years*. Discover traces of park history that lie hidden beneath the surface and off the beaten path, places and events that are generally not interpreted by the park but are apparent when you know where to look. See billion-year-old rocks, and discover Apache Fort, site of an early Indian battle. Visit the location of the 1915 RMNP Dedication Ceremony. Discover the "phantom" Big Thompson entrance station, a main park entry that was obliterated in the 1960s and Phantom Valley Ranch, an early homestead turned guest ranch tucked along the Colorado River. Explore the site of the park's ski area. Check out a 1930s CCC camp. Witness the changes floods in two different centuries have left on the park. Wander inside an elk enclosure and see 21st century wildlife management in action. ♦♦♦

CSM credit available    Meets at the Rocky Mountain Conservancy Field Institute

**This class has over 16 hours of contact time for 1 credit.**

#### **NEW! Anna Wolfrom Dove & the Wigwam Tea Room**

**Nina Kunze    August 16    \$80 per adult ages 16 and older**

Anna Wolfrom Dove was a single woman homesteader who earned the claim to her land in 1914. Anna operated a successful tea room named the Wigwam on her homestead and in its heyday, the tea room attracted up to 200 visitors a day. The buildings still stand in what is now Rocky Mountain National Park. We will learn about Anna's remarkable life while we visit the site of her tea room, and will also discuss the other single woman homesteaders in the Estes Park area: Ida McCreery, Esther Burnell, Katherine Garetson, and Amanda Blocker Byrd. ♦♦♦ (CSM credit available) Meets at the Field Institute

### **Hiking & Skill-building Classes:**

#### **Tracking Wildlife in Rocky: Signs of Creatures Big & Small**

**Jeff Connor    May 8    \$80 per adult ages 16 and older**

A story exists all around us as we walk through the woods. Animals use the same area we do, but often go unnoticed since much of their activity occurs off trails, at night, or early or late in the day. Do you know how to read the signs they leave behind? If not, this class is for you. Walking through the woods, along streams and in meadows we will look for animals and their signs, visit den sites used by bobcats, fox, coyote, and other animals and nests used by birds. From a distance, if the road is open to Rainbow Curve, we will look at the habitat black bears use to select their dens. Participants will be surprised by the

abundance of sign left behind by our furred and feathered friends. The class will also provide a better understanding of community ecology and dynamics relative to hierarchical structure and trophic cascades.

◆◆◆ CSM credit available Meets at the Rocky Mountain Conservancy Field Institute