

Secrets of the Shrub Steppe

Methow Conservancy Methow Conservation Course

2010 Course Syllabus

February 1st: Shrub Steppe Development - From glaciers to butterflies

Dana Visalli, Naturalist and Botanist, and Eric Bard, Geologist

February 8th: Early People - First contact with people of the Methow

Jack Nisbet, Writer and teacher

February 16th (Tuesday): Deep Dirt – The varied strategies of burrowing animals

Kim Romain-Bondi, Wildlife Biologist

February 22th: Animal Survival – Islands of life in a harsh world

Michael Schroeder, Upland Bird Research Biologist

March 1st: Landscape Disrupted – Dramatic forces and subtle shifts

Jerry Benson, Restoration Ecologist

March 8th: Stopping the Decline – Realistic efforts to preserve and restore habitat

Heidi Newsome, Wildlife Ecologist

April 17th – FIELDTRIP: Plant adaptations and ecology of the shrub steppe

George Wooten, Conservation Biologist and Botanist, and Rob Crandall, Restoration Ecologist

Note: For this course, we have provided you with relevant readings (paper or on-line format) for each course presentation, which are outlined within this folder under each author/subject heading. For the avid shrub steppe enthusiast, we have provided you with an additional list of optional readings. Asterisks ** represent a book or journal article that is a must read; maybe for those who don't have time to read all the material, or if you are looking for a holistic reading that will carry you through this course and beyond. Enjoy!

February 1st - Shrub Steppe Development - From glaciers to butterflies

The shrub steppe is a place of subtle beauty and brilliant adaptation to arid conditions by plants and animals that survive in a fragile and complex web of interrelationships. Naturalist Dana Visalli and geologist Eric Bard will help us explore geological and glacial formations and the evolution of plants and animals, to understand how this arid environment constructed itself from the ground up since the last ice age. These influences will help us connect the shrub steppe environment of the Columbia Basin to the Methow Valley, and understand the differences and similarities between the two ecosystems. We'll discover the dynamic nature of the shrub steppe, subtle complexities in soils and habitats, wildlife's special adaptations, unique pollination techniques, and life in the soil crust.

Presenters: **Dana Visalli** is a professional botanist, educator and nature writer living and working in the Methow Valley. He has surveyed for rare plants throughout the American west under contract with government agencies, and recently completed a botanical consulting project in northern Iraq. He has for 14 years served as editor of the natural history journal *The Methow Naturalist*, and for 17 years has directed the adventure-ecology Methow River Camp for children.

Eric Bard has taught Geology and Earth Science for the last 15 years. He teaches all ages of students, from ages 10-60 in a variety of environs (Jr. High to high school classrooms, outdoor education, community college, local geology field trips, etc.). Currently he is a part time professor at Pierce College, and is currently working as the Stewardship Associate for the Methow Conservancy's Stewardship Program in Winthrop, WA.

Core Readings:

1. Report: '**Shrub-Steppe Conservation Prioritization in Washington State**' by George Wooten online at <http://www.kettlerange.org/steppeweb/>. An interesting and easy to read overview of shrub-steppe natural history; focus mainly on the introduction.
2. Web-page: '**Shrub-Steppe: Washington's Disappearing Sea**' by Joe Rocchio. This is a well-written blog overview with some good pictures: <http://aapamire.blogspot.com/2009/02/sagebrush-steppe-washingtons.html>
3. Book Chapter: '**Columbia River Plateau**' (Chapter 10) from Geology of the Pacific Northwest by W. and E. Orr. A geological overview with photographs on the geology of our region.
4. **Handout: '**Observing the Methow's Shrub-Steppe**' by Dana Visalli.

Additional optional readings:

1. **Book: **Sagebrush Country: A Wildflower Sanctuary** by Ronald Taylor, 1992 is the best popular wildflower book for the Columbia Basin.
2. Book: **Northwest Dryland Wildflowers: Sagebrush & Ponderosa** by Dana Visalli, 2005 is better for the Methow shrub-steppe.
3. There is an assortment of geology lectures on DVD at the Methow Conservancy's library from the 2006 Methow Geology Conservation Course. Please check them out through Mary Kiesau at the Conservancy.

February 8th - Early People - First contact with people of the Methow

When North West Company fur agent David Thompson stopped at a native encampment near the mouth of the Methow River in the summer of 1811, he recorded the first written descriptions of the place and its people. When Scottish naturalist David Douglas accompanied fur trade brigades back and forth along the same route between 1826-33, he made the first systematic attempts to gather and identify the area's flora and fauna. Relying on the field notebooks, letters, maps, and specimens left behind by these and other fur agents, we will try to sort out what the earliest white visitors to this area saw, how the local tribes who guided, fed, and informed them moved through the landscape, and whether this extended period of contact can help us understand the shrub steppe left around us today.

Presenter:

Jack Nisbet grew up in North Carolina and moved to eastern Washington in 1971. His teaching, museum work, presentations, and writing all begin with the human and natural history of the Columbia River drainage. Nisbet is the author of *Purple Flat Top; Singing Grass, Burning Sage; Visible Bones*; and two books about fur trader David Thompson: *Sources of the River* and *The Mapmaker's Eye*. His most recent project, *The Collector*, explores the interactions of Scottish naturalist David Douglas with the landscape and culture of our region.

Core Readings:

These articles written by Jack Nisbet can be reached at his "Boundaries" column at www.northcolumbiamonthly.com/boundaries/boundaries.shtml

1. '**Pismires**,' January 2007. A fun read about the ecology of thatch ants we see often in the shrub steppe.
2. ** '**Rootfood**,' July 2008. An account of the spring tribal bands gathering camas, bitterroot, and Lomatium.
3. '**Fish Doctor**,' August 2009. Revelations about fish bones analyzed from Indian encampments.

Additional optional readings:

1. Book: **The Mapmaker's Eye** by J. Nisbet, WSU Press, 2005.
2. Book: **Visible Bones** by J. Nisbet, Sasquatch Books, 2007.
3. Book: **The Collector** by J. Nisbet, Sasquatch Books, 2007.

February 16th (Tuesday) - **Deep Dirt : The varied strategies of burrowing animals**

We'll take a journey during this lecture to the most basic habitat element of the shrub steppe, the burrow. We'll explore fossorial species, or wildlife that burrow underground, to see how their lives are influenced by their surroundings and each other, and how burrowers affect the soil and plant life adapted to their life processes. We explore the life cycles of predator species such as the badger, the innocent and endangered pygmy rabbit and burrowing owl, and Washington ground squirrel. As well we'll bury ourselves with the ancient and slimy spadefoot toad. We'll also acquire a better understanding for the function fossorial species play on the shrub steppe landscape.

Presenter:

Kim Romain-Bondi is currently working as the Senior Wildlife Biologist for Pacific Biodiversity Institute, and filling in additional work as a consultant for local organizations. She was employed for 6 years by Washington Dept of Fish and Wildlife, several of which she worked here in the valley as the Methow Wildlife Area Manager. She received her B.S. in Zoology from Arizona State University, and her M.S. in Wildlife Ecology studying non-invasive sampling techniques from Washington State University. Locally, she has worked with volunteers to survey wetlands for amphibians, assisted with the Beaver reintroduction project, dabbled in restoration of historic agricultural fields, and is currently starting up a partnership project focusing on western gray squirrel conservation.

Core Readings:

1. Scientific review article: '**Pocket gophers in Ecosystems: patterns and mechanisms**' by Huntley and Inouye, 1988. *BioScience*, Volume 38, 7-pages (786-793). Discusses the importance of burrows and mounding of soils in arid environments.
2. ** Scientific review article: '**A review of burrowing by semi-fossorial vertebrates in arid environments**' by Al Kinlaw in 1999. From the *Journal of Arid Environments*, Volume 41, 18-pages (127-145). An overview of fossorial animals around the world, and the ecology of the burrow system in desert ecosystems; skim through for interesting facts about burrowing ecology.
3. Article: '**Urchins Underfoot: Spadefoot Toads**' by Mary Kiesau, in *The Methow Naturalist*, Spring 2005 Volume 10, 2 pages (6-7).

Additional optional readings:

1. Scientific review article: '**Mounds of the American Badger: significant features of the North American shrub steppe ecosystems**' by D. J. Eldridge, 2004. *Journal of Mammalogy*, Volume 85, 7-pages (1060-1067). Scientific and relevant to our shrub steppe environment- see how important badgers and their burrows really are.

February 22th - **Animal Survival : Islands of life in a harsh world**

There are special features that support the highest diversity of wildlife and plant species in the shrub steppe landscape. These include the often hidden and most influential rocky outcrops, wet meadows, aspen stands, coulees, cliffbands, conifer pockets, and ephemeral springs and streams. We'll explore the arid shrub steppe landscape's connection to water, and how plant and animal species adapt to the temporary nature of this critical habitat element. We'll take you up high to view the importance of cliff bands and coulees in our relatively horizontal environment, as well as microscopically low to understand the intricacies of rocky outcrops and lithosol soils. We'll also explore the microhabitats that support the shrub steppe's more rare wildlife species such as the sharp-tailed grouse, jackrabbit, and sage thrasher.

Presenter:

Michael Schroeder has been employed as the Upland Bird Research Biologist with the Washington Department of Fish and Wildlife for the last 18 years. He received his Bachelor of Science degree from Texas A&M University, his Master of Science degree from the University of Alberta, and his Doctor of Philosophy from Colorado State University. Mike is a Certified Wildlife Biologist and works on grouse and bird conservation issues at national and international scales. He is a member of the Western Sage and Columbian Sharp-tailed Technical Committee and the International Grouse Specialists' Group. Mike has been involved with grouse research and management issues for almost 30 years. He has also worked on shrubsteppe issues in Washington; particularly those related to conservation and management of birds.

Core Readings:

1. Publication: '**Keeping birds in the sagebrush sea**' by S. A. Ritter, and C. Paige, published by Wyoming Wildlife, March 2000 issue. A glossy introduction to management practices that benefit our wildlife species.
2. **Scientific Review Article: '**Teetering on the edge or too late? Conservation and research issues for avifauna of sagebrush habitats**' in *The Condor*, Volume 105, 2003. 23-pages (611-634). An attempt to identify priority research issues needed for conservation of birds in sagebrush ecosystems in western North America.
3. Scientific Review Article: '**Shrubsteppe bird response to habitat and landscape variables in eastern Washington, U.S.A.**' in *Conservation Biology*, Volume 14, 2000. 15-pages (1145-1160). This paper examines the response of birds to landscape variables in shrub steppe communities across eastern Washington.

Additional optional readings:

1. Book: **Singing grass, burning sage** by Jack Nisbet, 1999. A fun overview about the historic scene and ecology of the Columbia Basin.
2. Report: '**Use of CRP fields by greater sage-grouse and other shrub steppe associated wildlife in Washington**' by Schroeder and VanderHaegen, WDFW, Oct. 2006
3. Poster presentation: '**The Conservation Reserve Program and shrub steppe birds in eastern Washington**' by Schroeder and VanderHaegen, WDFW, 2005

March 1st - **Landscape Disrupted : Dramatic forces and subtle shifts**

Disturbance events over the last several hundred years have shaped the shrub steppe landscape as we see it today. We will discuss the positive and negative impacts that historic natural and introduced disturbances such as fire and grazing had on the shrub steppe landscape, and the ecological interactions they imparted on the soils and vegetation communities. Looking at the stark and arid landscape of the shrub steppe, we wonder what makes up a healthy ecosystem and how plants (both weeds and natives) play a role our environment. Restoration ecologists study this dynamic process, and our presenter Jerry Benson will explain how genetics, soil chemistry, and micro-organisms help rehabilitate and restore the landscape, and what you can do to protect and restore the Methow Valley's shrub steppe habitats.

Presenter:

Jerry Benson was a botanist - habitat ecologist with WDFW for 30+ years. His work emphasis focused on evaluation and characterization of habitat often as part of mitigation projects and large scale habitat restoration for many wildlife species. Jerry currently is the manager of Benson Farms Inc. and BFI Native Seeds, where his organization specializes in the production of native grasses and forbs for rehabilitation and restoration of Pacific Northwest landscapes.

Core Readings:

1. Journal article: **'Use of native plants on federal lands: policy and practice'** by Richards, Chambers and Ross. 1988 Journal of Range Management Volume 51. 7-pages (625-632). A review and discussion of native seed uses for fire rehabilitation and mining reclamation projects under federal land management agencies.
2. ****Journal article: 'The Effect of Invasive and Noxious Plants on Land Management in Eastern Oregon and Washington'** by Richy Harrod, 2001, in Northwest Science, Volume 75, 6-pages, (85-90). A local eastern Washington U.S. Forest Service ecologist's discussion on the key issues associated with invasive species and forest and rangeland health.

Additional optional readings:

1. Book: **Ben Snipes Northwest Cattle King**, by Roscoe Scheller. Available through the Regional Library System or purchased at local and online book stores.

March 8th - **Stopping the Decline : Realistic efforts to preserve and restore habitat**

Our final class will focus on why and how shrub steppe conservation is taking place. Biologists are using specific criteria and modeling techniques to prioritize the landscape for restoration on a micro-site and landscape level with specific species or a broad ecological focus in mind. Our presenter will use the Hanford National Wildlife Refuge system as an example to explain long term wildlife and habitat restoration targets, goals and objectives. After better understanding the restoration selection and criteria process, we'll investigate the success of restoration projects, including studies of wildlife that re-inhabit restored landscapes. We'll also discuss what you can do as an individual and landowner to protect and restore shrub steppe species (flora and fauna) in your own backyard.

Presenter:

Heidi Newsome began her career in 1988 with the U.S. Forest Service. She has been a Wildlife Biologist for the National Wildlife Refuge System for the past 13 years, and has worked in the Mid-Columbia Region since 1999. She is currently a Wildlife Biologist with the U.S. Fish and Wildlife Service at the Mid-Columbia River National Wildlife Refuge Complex. Heidi has a Bachelor's degree in psychology/biology from Santa Clara University (1990) and a Master's Degree in Wildlife Science from Oregon State University (1997). Her focus over the past several years has been shrub-steppe ecology and management. Her duties at the Refuge Complex include wildlife surveys, invasive plant management, and native habitat restoration.

Core Readings:

1. Scientific review article: '**Effective management strategies for sage-grouse and sagebrush: a question of triage?**' by Wisdom et al., 2005. Found in Transactions, North American Wildlife and Natural Resources Conference, Volume 70, 21-pages (206-227). This article defines central paradigms for maintenance, restoration, and management of sagebrush habitats.

2.** Scientific review article: '**Countering Misinformation Concerning Big Sagebrush**' by Welch and Criddle, 2003. From U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Report Number RMRS-RP-40. 28 pages. A controversial article examining the scientific merits of axioms of range or vegetative management pertaining to sagebrush.

Additional optional readings:

1. Report: '**Recovery and Rehabilitation of vegetation on the Fitzner-Eberhardt Arid Lands Ecology Reserve, Hanford Reach National Monument, Following the 24 Command Fire: Final Report 2001-2004,**' 254 pages. A report of how cheatgrass and native plants have responded to fire; read through the Executive Summary for a review of their findings.

2. Scientific Review Article: '**Big sagebrush: A sea fragmented into lakes, ponds, and puddles**' by Welch, 2005. From the U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. Report Number RMRS-GTR-144. 210 pages.

3. Webpage/ Articles: '**Ecology and Conservation of Greater Sage-Grouse: A Landscape Species and Its Habitats,**' <http://sagemap.wr.usgs.gov/monograph.aspx>. This webpage is a clearinghouse for a number of scientific articles about the greater sage grouse, sage steppe lands, and restoration activities. See relevant Chapters 11, 12, and 24.

April 17th, FIELDTRIP: Plant adaptations and ecology of the shrub steppe

For a few weeks each year, the Northwestern shrub-steppe explodes in a myriad of miniature flower pageants. Each show lasts a few weeks to be followed by another just as vivid. And then, just as quickly, the scene fades to brown and drab, to await the following spring. The parade of spring ephemerals has been carefully choreographed for eons. It is set against a backdrop of herds of grazing animals moving between the last snows of winter and the unrelenting summer sun. This trip will explore how the plants and animals have adapted to extreme weather and soil conditions, the co-evolution of species on the landscape, plant defenses to herbivory, as well as factors that favor shrubs, grasses and herbs on our shrub steppe lands.

Presenters:

George Wooten is trained as a biochemist and molecular biologist, but spent most of his career in the biological world studying botany and ecology. He has worked as a botanist for the Forest Service and Pacific Biodiversity Institute, where he also learned a few things about remote sensing and mapping. George teaches several courses at Wenatchee Valley College, including animal identification, botany and web design. He works with Conservation Northwest on forestry issues, wildland fires and connecting and protecting wildlife corridors from the coast to the Rockies. He wears a number of hats, and is most happy while walking with a backpack.

Rob Crandall founded and operates Methow Natives, a local native plant nursery. Since 1999, the nursery specializes in the propagation of plants native to the Methow Valley, and is dedicated to providing services that aid in the stewardship of the Methow watershed and surrounding areas. Rob works closely with the Methow community to restore riparian and shrub steppe ecosystems, hosts a variety of restoration workshops and programs for landowners, and he helped the Methow Conservancy create their "Shrub Steppe Restoration Handbook." Rob has been involved in environmental education for 12 years in the Methow Valley, working with students of all ages. Some of Rob's programs include: River Camp, the Methow Valley Restoration Education program, and Watershed Watcher's.

We will let you know after the class but prior to April 17th where this fieldtrip will be held and where carpoolers can meet. We will ask for RSVPs in early April just so we have a sense for how many of you are likely to attend.