February 2016

Birding Observer

Five Valleys Audubon Society, a Chapter of the National Audubon Society

Calendar of Events

- **Monday, February 1st:** The board meeting will be held at the Missoula Public Library, 6:45-8:45pm.
- **Monday, February 8th:** Andrea Stierle will discuss her research on Butte's Berkeley Pitt at the February meeting, at 7:30pm, in room L14 of the Gallagher Business Building at UM campus.
- **Monday, February 15th**: Submission deadline for the March edition of the *Birding Observer*.
- **Saturday, February 20th**: Bird walk at Lee Metcalf NWR from 10:00am-Noon. Meet the field trip leader at the Refuge Visitor's Center.
- **Saturday, February 27th:** All-day field trip to the Mission Valley. Meet in the northwest corner of the Adams Center parking lot at 8:00 am or at the Cenex Station in Ronan at 9:00 am.
- **Various Dates in February and March:** Advanced Birding Workshop. See details on page 7.

And now for something completely different: Searching for drugs in peculiar places

Travel with Five Valleys Audubon to the majestic Berkeley Pit in Butte Montana, ground zero of the largest EPA Superfund site in North America. At the meeting on Monday, February 8th at 7:30 pm, Andrea Stierle will describe some of the research that she and husband/collaborator Donald Stierle have been involved in for the past twenty years. Our meeting will be held in room L14 of the Gallagher Business Building.

The Stierles' research began when they were faculty in the Department of Chemistry at Montana Tech, a small mining college in Butte. Andrea and Don began their exploration of the secondary metabolites of fungi and bacteria surviving and thriving in an abandoned open-pit copper mine that has evolved into an acid mine waste lake. Berkeley Pit Lake now contains over 150 billion liters of metal sulfate rich, acidic "water" (pH 2.5) and sits at the headwaters of the Clark Fork and Columbia Rivers. With its low pH and high metal content, it was considered too toxic to support life.

In 1995, however, Andrea began to isolate fungi and bacteria from water and sediment samples. Although conditions within the Pit Lake System were too toxic for "normal" aquatic biota, these same conditions provided an ideal environment for extremophiles which have proven to be a dynamic source of bioactive drug-like molecules waiting to be discovered. The Stierles moved their lab to the University of Montana in 2009 and are currently Research Professors in the Department of Biomedical and Pharmaceutical Sciences. They have isolated compounds with activity against non-small cell lung cancer, ovarian cancer, melanoma, retinoblastoma and leukemia, as well as a new antibiotic with activity against MRSAs from this collection.

Andrea and Don are organic chemists. Andrea earned her doctorate in Organic Chemistry from Montana State University where she discovered the first host specific toxin against the weed pest spotted knapweed and found that several putative sponge metabolites were actually produced by bacterial endosymbionts. As a Research Assistant Professor at Montana State University she discovered a fungus in the bark of the Pacific yew tree that produced paclitaxel in *de novo* fashion. This unique fungus – *Taxomyces andreanae* - was named after Andrea, its discoverer.

As Research Professors at the University of Montana, Andrea and Don continue to explore the drug-like molecules produced by mine waste extremophiles, human gut microbes and Ayurvedic plants in their search for new anticancer agents and antibiotics.

Berkeley Pit

Peeps From The Board: Gifts from a Toxic Sea
By Andrea Stierle

This story *almost* begins on a dark and stormy night in November of 1995, when 342 hapless Snow Geese landed on a lake in Butte, Montana. Unfortunately, this was no ordinary lake and the story did not end well for these birds. But they are part of a larger story that actually began – at least for us – four months earlier, in July of 1995, when we first found life in the Berkeley Pit, an abandoned open-pit copper mine situated about a mile from our lab at Montana Tech. Unlike many Audubon narratives, this is not a tale of avian ecology in a remote and exotic ecosystem, although birds – and ecosystems - do play a part in this story. Rather, it is a dual tale of a damaged ecosystem closely connected to Missoula by the Clark Fork River, and of the possibility of finding value in even the most unlikely of places.

Life exists in a range of environments, including some that seem too harsh to support life. They include natural systems such as deep-sea vents, salt brines, and thermal pools, as well as those caused by human activities such as mining, industrial accidents, or munitions testing. Nobel laureate Paul Crutzen suggested that we are living in the "anthropocene", with humans and human activities acting as a major geological force on the planet. Whether man-made or natural, extreme environments can harbor life forms called *extremophiles*.

Although the search for new extreme life forms conjures the image of daring adventurers exploring exotic terrestrial, lunar, or Martian landscapes, Berkeley Pit Lake (BPL) sits in the scenic Rocky Mountains in the heart of Butte, Montana. And the daring adventurers are my husband Don and I, two organic chemists trying to solve some of life's most persistent problems through the discovery of new antibiotic, anti-inflammatory and anticancer agents. We typically explore the "secondary metabolism" of plants and fungi from diverse environments for new drug-like compounds. But when we discovered life in the Pit in the guise of three filamentous fungi, we decided to "test the waters" for something of interest. Twenty years later, we are still enmeshed in this exploration in the abandoned copper mine that is the unlikely source of our discoveries.

The Berkeley Pit mine opened in 1955. It was initially operated by the Anaconda Copper Company and later the Atlantic Richfield Company (ARCO) until its closure in 1982. Despite a mandate from the EPA to operate the water pumps "in perpetuity" to prevent the infiltration of groundwater into this mile-wide, 1500 ft. deep hole, they were mysteriously turned off on Earth Day 1982. Groundwater and rain began to fill the Pit, rising at the rate of one foot a month. Thirty-three years later, there is over 40 billion gallons of water inexorably rising to the "critical point" where the bedrock meets the alluvial interface and contaminated water will flow into Silver Bow Creek, a major tributary of the Clark Fork of the Columbia River. Because of its size, toxicity, dynamics and location, BPL is part of the largest EPA Superfund site in North America and a potential ecological time bomb. It is also an evolving, dynamic ecosystem and a classic by-product of the industrial age when mining regulations – or lack thereof – allowed such environmental devastation to occur. Although conditions within the Pit are toxic for "normal" aquatic biota, the extremophilic microbes adapted well to the environment.

The Pit microbes studied to date are classified as acidophiles, thriving at a pH of 2.5, as well as metal-tolerant, withstanding high levels of copper, iron, zinc, cadmium and other metal sulfates. These conditions have selected for a microbial population that have evolved a number of survival strategies. We proposed that these survival mechanisms include the production of small molecules that regulate pathways associated with low pH and oxidizing conditions. We hoped to demonstrate that these small molecules might also be deployed as drugs to regulate pathways in mammalian systems that are associated with an acidic microenvironment, including inflammatory diseases and certain cancers. We have already isolated over seventy compounds from these amazing fungi that target specific human cancer cell lines including ovarian, non-small cell lung and leukemia. But my favorite fungus might have been deposited by one of those Snow Geese that visited the Pit Lake so long ago. It is a yeast that had previously only been found in rectal swabs of geese. It actually sorbs

metal salts – like copper, iron, and chromium – from its aqueous surroundings, suggesting its dual potential for bioremediation and secondary ore recovery.

We will continue our explorations as long as our funding allows. These extremophiles and the compounds they produce might be the richest "ore" ever mined from the Richest Hill on Earth.

Chapter's Conservation Work Nationally Recognized
By Jim Brown

The National Audubon Society recently submitted a report to the North American Bird Conservation Initiative All Bird Bulletin that summarizes success stories about partnering with land trusts to protect priority landscapes. Land trusts are typically community-based nonprofit groups that protect wildlife, agriculture and open space values by securing conservation easements and by purchasing land to be transferred to conservation minded owners. Conservation easements are legal agreements that reduce the development potential of their land, generally in return for cash payment, tax advantages, or both. Five Valleys Audubon has partnered with Five Valleys Land Trust to accomplish this.

Here is what National Audubon reported about our work:

In Montana, Five Valleys Audubon Society has collaborated with Five Valleys Land Trust and the City of Missoula on several projects focused on private lands conservation, including two projects at Clark Fork River-Grass Valley Important Bird Area, a Continental IBA supporting Lewis' Woodpecker and other species. Bird surveys by Five Valleys Audubon at these sites documenting strong breeding populations of Long-billed Curlew, Bobolink, and diversity of species have helped Five Valleys Land Trust secure funding for easements through NRCS and the Open Space Bond Fund of Missoula County, and have helped in making a case for land purchases and preservation at several locations.

Annual Elections

In March of each year the Five Valley's Audubon Society holds elections for various vacant leadership positions. This year we have up to three vacancies on our Board of Directors. Our bylaws allow us to have up to seven Directors, and we have had six Directors for the past year. We are looking for volunteers who would like to stand for election to the board.

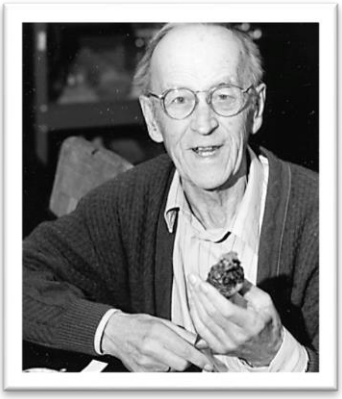
As I have solicited for possible volunteers, a common refrain I hear is that potential volunteers are concerned that they do not know enough about birds. Let me assure you that we do not administer any qualifying exams or field tests to potential Director candidates. We are looking for people who have an interest in environmental issues in general and in issues related to birds and their habitat. I can tell you from personal experience in serving as a Director that no matter how much you know about birdlife you will learn more about birds as you interact with other board members and volunteers.

If you are interested in helping your local Five Valleys Chapter as a Director or in any other capacity, please contact Edward Monnig at 549-0580.

Birds At Winter Nightfall
Thomas Hardy

Around the house the flakes fly faster,
And all the berries now are gone
From holly and cotoneaster
Around the house. The flakes fly!--faster
Shutting indoors that crumb-outcaster
We used to see upon the lawn
Around the house. The flakes fly faster,
And all the berries now are gone!

Philip L. Wright Memorial Research Awards
By Bill Gabriel



Dr. Philip L. Wright

In 1981 Five Valleys Audubon Society began a program of awarding small amounts of money to help students fund small research projects that could be completed in a few months. Originally called the Field Biology Research Awards, in 1992 the name of the program was changed to the Philip L. Wright Research Awards in recognition of Dr. Wright's contributions to science, Montana, and Missoula. In these 35 years, 76 university and high school students have received a total of $35,425 from the program. The amount per award has ranged from $100 to $1,180, and averaged $466.

Subjects of the research have been distributed as follows: birds 35, plants and habitats 17, mammals 10, amphibians 7, invertebrates 7, fish 4. While most of these small studies have been carried out within Montana, some have been as far afield as Alaska, Arizona, California, Colorado, Hawaii, Central America, and Southeast Asia.

A request for proposals (RFP) for research to be funded this year has been distributed within UM and to local high schools. Proposals for the 2016 awards will be due on March 24, 2016.

Missoula Christmas Bird Count
By Larry Weeks

The Missoula CBC was held on December 19, 2015. Eighty-two species were documented on Count Day and 3 additional species were seen during Count Week. This is the fifth consecutive year that we have been in the eighties. Jim Brown gets five gold stars for finding and identifying a Fieldfare near Harpers Bridge Road. The Fieldfare is a bird of Europe and Russia, and is sometimes seen in the northeastern U.S. It is the first documented sighting for Montana. It was seen by many people during the five days it was present. The consensus is that the Fieldfare was killed by one of the raptors in the area. Jim Brown's group birded the old Mastel property and Trout Meadows, and contributed greatly to the Count with the only Northern Pintail, Gadwall, American Coot, Short-eared Owl, American Robin, and American Tree Sparrow. They estimated the number of Short-eared Owls at 32.

The other unusual bird was a male Surf Scoter that was found in the Bitterroot River by Sleven's Island by Sue Reel and Dick Hutto. The Surf Scoter ended up being shot by a duck hunter. Sue and Dick also had the only Ruby-crowned Kinglet. Poody and Joe Regan's group had the only Northern Saw-whet Owl on Kelly Island. Debbie Leick's group had the only Golden Eagle up LaValle Creek. The eagle had a wing tag #227 which was captured by Rob Domench at the MPG Ranch on January 23, 2014. Thomas Kallmeyer's group had the only Cooper's Hawk in the Butler Creek area. Jim Sparks' group had the only Prairie Falcon along the Kim Williams trail. Rose Leach's group had the only Brewer's Blackbird along Mullan Road. And the author's group had the only Pacific Wren in the Charlotte Marbut Sanctuary along Grant Creek. The author's group also had five 2nd & 3rd grade girl scouts and they were able to get multiple looks at a Northern Pygmy-Owl through the author's spotting scope. The feeder watchers also contributed to the species count. Sue Graf, who lives in the Big Flat area, had the only Cassin's Finch, Bob & Sharon Hinshaw had the only White-winged Crossbill and Roy Cellan had the only Evening Grosbeak at Colorado Gulch. Other group leaders included Brian Williams who hiked the Stewart Peak trail, Robin Anderson who birded the UM and Greenough Park, Denver Holt & Matt Larson who birded west of the airport, Cynthia Hudson & Roger Hogan who birded the Council Grove and Kona Ranch, Cathy Smyers who birded the State Nursery and Tower St. Open Space, Paul Hendricks who birded Marshall Canyon and Woods Gulch, Terry Toppins who birded the Maclay Flat and Big Flat, Zona Lindemann who birded the Target Range and Orchard Homes, Cindy Swider who birded an area between Mullan Road and the Clark Fork River near Angelina Way, and Joy Earls who birded near her home on Snowdrift Court. There were 84 participants in the field and 9 feeder watchers who were not involved with the field count. The Count concluded with a potluck at the author's home. My thanks to all the participants.

Missoula Christmas Bird Count 2015		
Pied-billed Grebe (2)	Wild Turkey (94)	Brown Creeper (9)
Great Blue Heron (50)	American Coot (4)	Pacific Wren (1)
Canada Goose (1153)	Killdeer (28)	Marsh Wren (4)
Green-winged Teal (23)	Wilson's Snipe (10)	American Dipper (4)
Mallard (740)	Rock Pigeon (399)	Golden-crowned Kinglet (18)
Northern Pintail (6)	Eurasian-collared Dove (379)	Ruby-crowned Kinglet (1)
Gadwall (3)	Mourning Dove (66)	Townsend's Solitaire (30)
American Wigeon (16)	Great Horned Owl (22)	American Robin (2)
Ring-necked Duck CW	Northern Pygmy-Owl (2)	Fieldfare (1)
Common Goldeneye (116)	Long-eared Owl (22)	Bohemian Waxwing (113)
Barrow's Goldeneye (5)	Short-eared Owl (32)	Cedar Waxwing (94)
Bufflehead (18)	Northern Saw-whet Owl (2)	Northern Shrike (3)
Hooded Merganser (3)	Belted Kingfisher (29)	European Starling (33)
Common Merganser (15)	Downy Woodpecker (35)	American Tree Sparrow (29)
Surf Scoter (1)	Hairy Woodpecker (20)	Song Sparrow (77)
Bald Eagle (20)	Northern Flicker (160)	Dark-eyed Junco (98)
Golden Eagle (1)	Pileated Woodpecker (15)	Red-winged Blackbird (124)
Northern Harrier (8)	Steller's Jay (19)	Brewer's Blackbird (1)
Sharp-shinned Hawk (7)	Clark's Nutcracker (4)	Pine Grosbeak (20)
Cooper's Hawk (1)	Black-billed Magpie (442)	Cassin's Finch (4)
Northern Goshawk CW	American Crow (74)	House Finch (514)
Red-tailed Hawk (80)	Common Raven (98)	Red Crossbill (17)
Rough-legged Hawk (48)	Black-capped Chickadee (171)	White-winged Crossbill (2)
American Kestrel (15)	Mountain Chickadee (25)	Common Redpoll (250)
Merlin (4)	Chestnut-backed Chickadee CW	Pine Siskin (57)
Prairie Falcon (1)	Red-breasted Nuthatch (41)	American Goldfinch (122)
Gray Partridge (37)	White-breasted Nuthatch (35)	Evening Grosbeak (2)
Ring-necked Pheasant (47)	Pygmy Nuthatch (28)	House Sparrow (397)
Ruffed Grouse (5)		
	82 species	**7284 total birds, 3 count week (CW) species**

In Appreciation

The Five Valleys Audubon Society would not function without the many hours put in by our many volunteers. Often this work goes forth with little notice; critical functions just happen without a lot of fanfare and drama.

One such function is arranging our monthly meeting programs and the various speakers who inform and entertain us. For the past many years Carolyn Goren has served as our volunteer program coordinator and has provided many wonderful speakers and presentations for our monthly meetings.

After these many years of service Carolyn has decided to take a well-deserved break. The Directors, Officers, and other committee volunteers would like to give a big thank you to Carolyn for her quiet, effective service.

And thanks are also in order to Susie Wall who has agreed to take over this Program Coordination position. We look forward to many good future programs.

Challenge To Our Members!
By Rose Leach

Several thoughtful members have volunteered to ask their favorite businesses for silent auction items for year's Montana Bird Festival (3-5 June 2016, Missoula, MT, http://fvaudubon.org/festival/). If everyone reading this newsletter would contact 1 business that you know or where you shop, then we would have a fantastically successful silent auction.

We are pleased to announce that all of the proceeds that our Chapter keeps (half of the silent and dessert auction totals) will go toward our Chapter's new **Legacy Fund** (fvaudubon.org/legacy). The Fund will be used for local habitat improvement projects (e.g., plantings, benches, information signs and similar projects), to improve conditions for birds, and increase our local enjoyment of our smaller open spaces and parks.

All you need to do is contact the silent auction chair, Jean Duncan (*see* back of newsletter) ***before*** you contact your favorite shop, so that we don't double ask at businesses. Local vendors are usually more than happy to donate, and it provides them with a tax deduction as well as some free advertising on the auction sheet.

If contacting a business is not for you and you are a proud baker (and most of you are!), please consider tempting us with a stellar dessert for our Saturday evening **Dessert Auction**. Again, half of all proceeds go to our new Legacy Fund. Some of these desserts are true works of art. We are already partnering with the local staff at the National Wildlife Federation, City Parks, and Montana Natural History Program on suitable projects that may be ready in time for the Festival! Please contact the chair—Rose Stoudt, 880-8060—if you would like to share one of your tempting confections with us.

So, you can do **FOUR** good things at once—get an item, support the Legacy fund, help a business or individual with a tax deduction, and provide them with advertising for a worthy project.

PS—Next month there will be a call for fine art and photography in our accompanying art show for the Festival—Stay Tuned (or contact Andrea Stierle, information on the back of the newsletter)!

June 3-5, 2016
Missoula, Montana
Field Trips

It's not too early to begin planning your summer birding adventures! When migration season begins in earnest, come join us in Missoula for **Montana Audubon's 16th Annual Bird Festival, co-hosted by Five Valleys Audubon at the Holiday Inn Downtown at the Park.**

We have over 20 field trips planned for each day! Each will be guided by knowledgeable birders and naturalists familiar with the species and habitats in the Missoula area. Here is a brief sampling to contemplate, as you anticipate the upcoming Bird Festival:

Bass Creek: This trip will explore upland meadows, foothill forests and riparian habitat. The primary goal of the trip is to observe a large breeding colony of Bobolinks, and renew our knowledge of Bobolink ecology. Other species that may be seen include Savannah Sparrow, Common Yellowthroat, Wilson's Snipe, Red-winged and Brewer's Blackbirds, Least and Willow Flycatchers, and Bullock's Oriole.

Pattee Canyon - Sam Braxton Trail: This field trip will follow a three-mile loop on a National Recreation Trail through ponderosa pine, western larch and Douglas fir forests with an elevation gain of 300 feet. Possible specialty birds include Clark's Nutcracker, Steller's and Gray Jays, Three-toed Woodpecker, Pileated Woodpecker, and Williamson's Sapsucker.

Upsata Lake – Monture Creek: At Upsata Lake, we will look for Bobolinks, Sandhill Cranes, Long-billed Curlews, Trumpeter Swans, Common Loons, and warblers. We'll also walk around part of the lake, birding the prairie potholes and surrounding grasslands. If time permits, we will drive to Monture Creek Campground and look for riparian and forest species.

Keep watch in early March: Festival Registration Brochures with all field trip information, speakers and schedules will be in the mail, and the online system for registration will be active.

For more information please contact Montana Audubon Bird Festival Coordinator, Cathie Erickson, **cerickson@mtaudubon.org**, or call (406) 443-3949.

Welcome To Our Newest Members

Sara Anderson
Patagonian Hands
Katrina Schopp
Sandy & Pam Volkmann
Eleanor Weidman
Kathleen Cooney
Charlotte Orr
Michael Schwisow
Vicki Watson
Linda Wicks-Yasenak

Advanced Birding Workshop By Larry Weeks

An advanced birding workshop has been scheduled for February and March 2016 that will include seven sessions on Thursday nights from 7:00 – 9:30 pm at the Fish, Wildlife & Parks Regional Office on Spurgin Road. Each session will be devoted to one bird group. The date, subject and presenter of each session are as follows:

Date	Bird Group	Presenter
Feb 18	Owls	Matt Larson
Feb 25	Shorebirds	Jim Brown
Mar 3	Flycatchers	Aaron Spidal
Mar 10	Raptors	Steve Hoffman
Mar 17	Gulls	Alex Hughes
Mar 24	Forest Birds	Jim Sparks
Mar 31	Sparrows	Larry Weeks

A person may decide to attend a single session, any combination of sessions or all seven sessions. The cost will be $15 per session or $70 for all seven. To sign up, please contact Larry Weeks at 549-5632 or bwsgenea@gmail.com.

Join Five Valleys Audubon Society

Please enroll me as a Chapter member of the Five Valleys Audubon Society. I will receive the Birding Observer and may participate in all local Chapter activities. I understand that my dues remain entirely with the Chapter.

Name: _____

Address: _____

City:_____ **State:**_____ **Zip:** _____

Phone: _____

Email: _____

Please note: The newsletter will be delivered electronically unless requested otherwise.

___ $15 for a 1-year, Chapter-only membership

__ An additional sum of $_____ is also included to support Chapter activities.

Please make check payable to the Five Valleys Audubon Society and mail to: **Five Valleys Audubon Society**
PO Box 8425
Missoula, MT 59807

Join National Audubon Society & Five Valleys Audubon Society

Please enroll me as a member of the National Audubon Society and my local Chapter. I will receive the *Audubon* magazine and *Birding Observer*, and I may participate in all local Chapter activities. I understand that my dues are shared between NAS and my local Chapter.

Name: _____

Address: _____

City:_____ **State:**_____ **Zip:** _____

Phone: _____

Email: _____

Please note: The newsletter will be delivered electronically unless requested otherwise.

__ $20 for a 1-year membership

C3Z N53 0Z

Please make check payable to National Audubon Society:
National Audubon Society, Inc.
225 Varick Street, 7th Floor
New York, NY 10014
Attn: Chance Mueleck

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