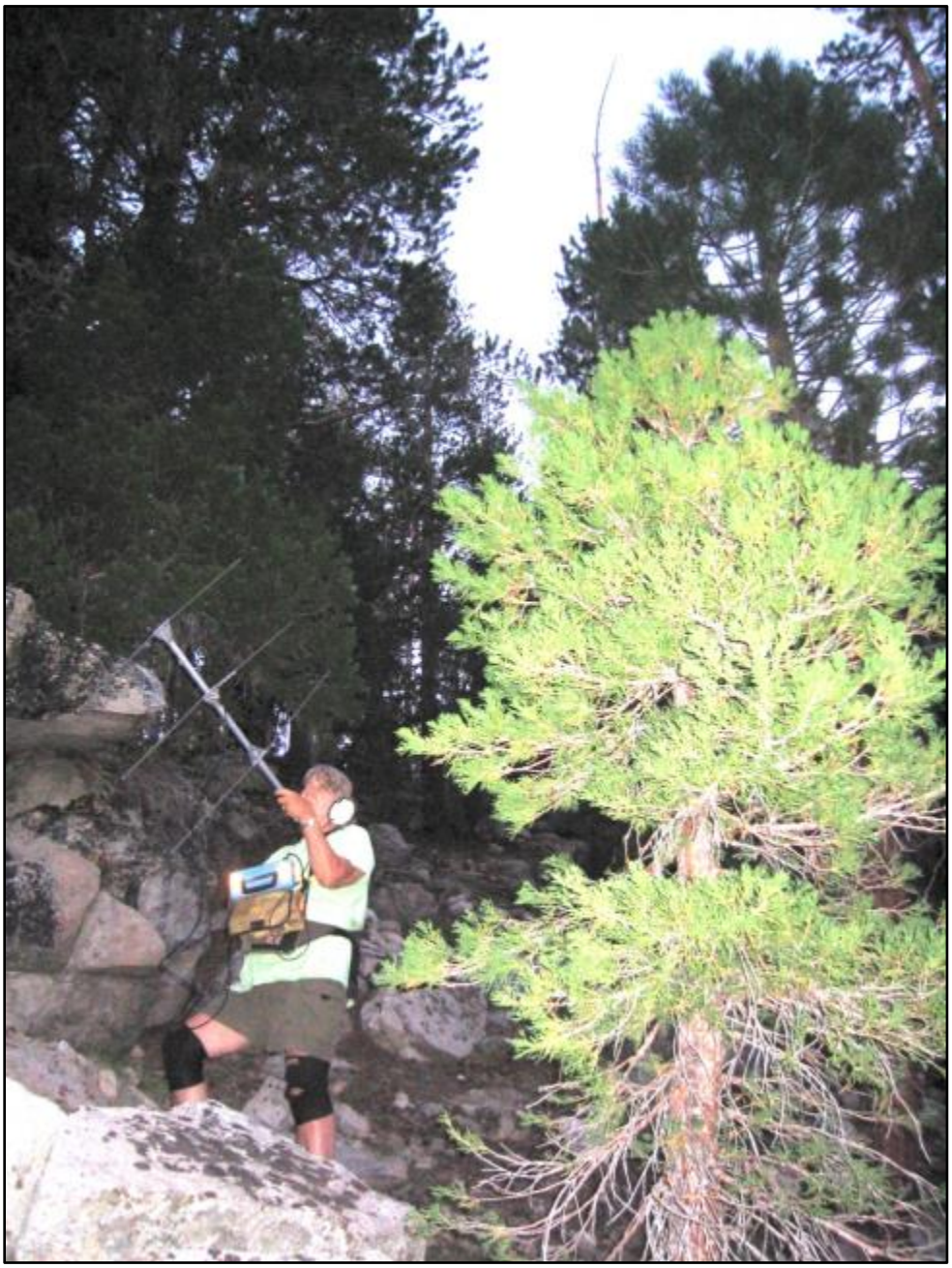
Western Bat Working Group

WBWG NEWS

Volume 9, Number 1 Summer 2014



Elizabeth (Dixie) Pierson radio-tracking bats in California

WESTERN BAT WORKING GROUP
NEWSLETTER

Summer 2014 Volume 9, Number 1

The Western Bat Working Group (WBWG) is a partner in the Coalition of North American Bat Working Groups. The WBWG is comprised of agencies, organizations and individuals interested in bat research, management, and conservation from 13 western States, the Provinces of British Columbia and Alberta, and Northern Mexico.

Membership in the WBWG is open to anyone who is interested in participating in bat conservation. There are no membership fees or dues. Funding for bat conservation work accomplished by the WBWG is generated by State and Federal land management agencies, non-governmental organizations, and by donations from individual members.

Visit our web page http://wbwg.org to contact us, find information on bat conservation and upcoming meetings, become a member, link to state or provincial bat working groups, or download previous issues of this newsletter.

President	Angie McIntire
Vice President	Laura Ellison
Treasurer	Brad Phillips
Secretary	Becky Abel
At-large representatives:	Amie Shovlain, Roger Rodriguez
Presidential appointees:	Rob Schorr, Dave Johnston

Newsletter Editors: Lorraine Andrusiak, Bronwyn Hogan

NOTE: Generally common names are used for bat species in the newsletter. Corresponding scientific names are listed below.

Common Name	Scientific Name
Arizona myotis	*Myotis occultus*
Big brown bat	*Eptesicus fuscus*
Californian myotis	*Myotis californicus*
Cave myotis	*Myotis velifer*
Eastern red bat	*Lasiurus borealis*
Fringed myotis	*Myotis thysanodes*
Greater mastiff bat	*Eumops perotis*
Hoary bat	*Lasiurus cinereus*
Little brown myotis	*Myotis lucifugus*
Long-eared myotis	*Myotis evotis*
Long-legged myotis	*Myotis volans*
Brazilian free-tailed bat	*Tadarida brasilensis*
Northern myotis	*Myotis septentrionalis*
Pallid bat	*Antrozous pallidus*
Pocketed free-tailed bat	*Nyctinomops femorosaccus*
Spotted bat	*Euderma maculatum*
Silver-haired bat	*Lasionycterus noctivagans*
Southwestern myotis	*Myotis auriculus*
Townsend's big-eared bat	*Corynorhinus townsendii*
Western small-footed myotis	*Myotis ciliolabrum*
Western red bat	*Lasiurus blossevillii*
Yuma myotis	*Myotis yumanensis*

IN MEMORIUM – ELIZABETH (DIXIE) PIERSON

Photo by Pat Brown

Dixie Pierson was one of the core founding members of the Western Bat Working Group. Dixie's tireless leadership and efforts promoted more effective bat conservation efforts globally. For over 25 years, she was one of the most influential personalities in the sphere of bat biology.
Dixie was courageous and strong but also gentle and humble. She felt personally hurt by injustices to bats. Her responses to those threats were often highly effective as a result of years of experience, research, intellect, and hard work. She was more than willing to put herself in jeopardy for the sake of bats, friends, and anything she held dear.

The strength of her personality made her one of the first influential female pioneers in bat biology and conservation, once an almost entirely male-dominated field. Her effectiveness inspired many other women to become bat biologists and/or conservation advocates. Of all of her accomplishments, it was the one she most cherished.

Dixie was a member of the team that developed the Townsend's big-eared bat Conservation Strategy in 1993 - 1994 that eventually led to the formation of the Western Bat Working Group in 1996. She and her husband, Bill Rainey, were the go-to experts regarding bat conservation, ecology, and management of bats in northern California. Their research was extensive and added greatly to the current knowledge of the habitat needs of little known species such as Townsend's big-eared bats, spotted bats, western red bats, and greater mastiff bats across their entire range.

Dixie was an incredibly valuable member of any conference, workshop or meeting. Her ability to cut through falsehoods and niceties of personality and bring forth a simple, candid embodiment of truth was unparalleled.

In addition to their participation in the formation of the WBWG, Dixie and her husband have an incredible number of accomplishments and successes to their credit in the conservation and management of bats. Dixie developed a key to bats of California that found widespread use by biologists across the western United States. Their strategies for survey and conservation of bats in bridges have been widely adopted across the entire country.

Dixie was the lead for the creation of the California Bat Plan, sponsored by the California Department of Fish and Wildlife. She gathered together other California bat

biologists to assist her, but she was the guiding force for the plan framework. Her cancer diagnosis and treatment limited her involvement at the phase where the final document was being compiled. As a legacy to Dixie, her friends and colleagues will complete this important task in her memory.

Photo by Bill Rainey

Photo by Bill Rainey

Dixie and Bill's many years of research and monitoring in Yosemite and Sequoia National Parks has resulted in some of the best information on bat fauna and ecology of any national park in the United States.

Their work on abandoned mines, caves, anthropogenic structures, and forest roosting bats has not only led to direct conservation efforts for specific bat populations, but increased knowledge of bat ecology across western North America.

Photo by Bill Rainey

Renowned for her work in protecting bats in the continental U.S., Dixie also played the lead role in writing the proposal for the Convention on International Trade in Endangered Species that gave international protection to many species of Pacific Island flying foxes.

The loss of her dynamic personality, profound influence and advocacy in bat conservation efforts leaves a vacuum in our small community unlikely to ever be filled. Her loyal friendship will be remembered and cherished by all who knew her well.
-Lyle Lewis

STATE/PROVINCIAL UPDATES

USA

Arizona

Artificial Bat Roosts in Bridges in an Extreme Climate

The Ina Road Bridge (fig. 1) is one of many bridges in Tucson that provide significant roosts for bats. This bridge is home to

10,000 to 15,000 thousand bats; cave myotis and Brazilian free-tailed bats during the summer, with less than 1,000 Brazilian free-tailed bats present in the winter. While the existing Ina road bridge provides an abundance of high quality crevice habitat, it has become structurally unsound and is inadequate to handle traffic volumes. As part of the environmental scoping process, Arizona Game and Fish (AZGFD) recommended mitigation for the large bat population roosting in the bridge.

Figure 1. Ina Road Bridge over the Santa Cruz River, Marana AZ

The existing two-lane bridge spans approximately 630 feet between the banks of the Santa Cruz River and has parallel expansion crevices that are used by the bats. The new design for the replacement consists of two flat-bottomed bridges which would not have crevices available for roosting bats. Because Tucson can get very hot during the summer and cold during the winter, it was important to design bat roosting habitat that is well-insulated, to mimic as closely as possible the temperature moderation provided by the thermal mass of the bridge. The Town worked with Premier Engineering, (Phoenix) to thicken a portion of the deck on the new Ina Road Bridge design and incorporate bat crevices in the thickened section.

While at the Western Bat Working Group meeting in Santa Fe last year, Sandy Wolf (who is working on a similar bridge project in Tucson on Houghton Road) happened to overhear Justin Stevenson and Holly Smith, of RD Wildlife Management, talking about a new type of bat box they were developing. Their design is a molded light-weight concrete product that provides a high insulation value. Joel Diamond (AZGFD), Sandy Wolf (Bat Research and Consulting), Justin Stevenson and Holly Smith (RD Wildlife Management, and I (Town of Marana) met to discuss creating a box to fit under the Cortaro Road and Houghton Road Bridges.

The Regional Transportation Authority Wildlife Linkages Working Group in Tucson approved just over $80,000 to fund incorporation of bat habitat into an existing bridge at Cortaro Road, just one mile north of the Ina Road Bridge and into one of the two new bridges replacing the existing Ina Road Bridge.

Figure 2. MODERNBAT modular boxes by RD Wildlife Management © April 2014

The box shown in figure 2 was installed by AZGFD on Marana's Cortaro Road Bridge in early May of 2014 (fig. 3). AZGFD constructed a metal frame to hold the box in place under the bridge and placed microclimatic data loggers in the old Ina

Road Bridge and in the new bat box under the Cortaro Bridge, to provide baseline data for comparison to post-construction conditions. Comparison with baseline conditions will allow us to determine the effectiveness of the new design in recreating existing bat roost conditions.

Figure 3. Installation of MODERNBAT © box under Cortaro Rd. Bridge

Through coordination with Arizona Department of Transportation, the same type of bat boxes will also be placed in gaps left in the thickened portion of the new Ina Road Bridge deck, sized to allow AZGFD to install the bat habitat boxes. AZGFD and Sandy Wolf will monitor for bats one year prior to construction and for two years post-construction.

The older bridge designs provided crevices for bats to roost; however, as these bridges are being replaced with new, flat-bottomed bridges, bat roosting habitat is being lost at an accelerating rate. This project has the potential to be a successful model for future bridge replacements so that habitat continues to be available for roosting bats in the Sonoran Desert.

- Janine Spencer

Colorado

Bats and the Southern Great Plains Rapid Ecoregional Assessment

Bats have been included as a key conservation element of the ongoing Southern Great Plains Rapid Ecoregional Assessment (REA), coordinated by Bureau of Land Management in cooperation with U.S. Geological Survey. This Rapid Ecoregional Assessment seeks to "rapidly"—within 3 to 4 years—assess and synthesize existing information on species and habitats of conservation concern in the Southern Great Plains.

The Southern Great Plains REA encompasses three ecoregions located in the South Central U.S.: the Central Great Plains, the High Plains, and the Southwestern Tablelands. Combined, these ecoregions total nearly 180 million acres managed mostly in private ownership. The area covers parts of five states: eastern Colorado, eastern New Mexico, north-central Texas, western Oklahoma, and western Kansas. Three of these states (Colorado, New Mexico, and Texas) have groups within the Western Bat Working Group.

Of the approximately 45 bat species that occur in the contiguous United States, 17 species (just under 40%) regularly occur in the Southern Great Plains. The bat species assemblage section of the REA will provide an introduction to the natural history of bats that occur in the Southern Great Plains, and will include brief discussions of bat diversity and distributions, roosting ecology, diet, and reproductive patterns of bats in this region.

This section of the REA will also address key change agents related to the

conservation and management of bats in the Southern Great Plains, including: human development; energy and infrastructure, including wind energy development; agriculture and grazing; altered fire regimes; invasive species; introduced insects and diseases, including white-nose syndrome; and climate change. For more information, see the Southern Great Plains Rapid Ecoregional Assessment website (link below) or contact Mark Hayes at: hayesm@usgs.gov.
http://www.blm.gov/wo/st/en/prog/more/Landscape_Approach/reas/splains.html#location

Utah

Utah Bat Conservation Cooperative and Utah Cavers

In late 2013, I was asked to be a liaison between the Utah Bat Conservation Cooperative and Utah Cavers. Specifically, the UBCC wanted to reach out to local cavers to learn more about where bats are roosting underground. Utah has 18 species of bats that have been studied to varying levels of detail, but information on roost sites is sorely lacking. There are only a few significant known cave hibernacula in Utah. These sites do not begin to account for the abundance of bats observed in the state. The UBCC recognized that any appropriate response to WNS in Utah should start with a reasonable baseline of current known conditions.

Thinking that cavers might have some information to offer, the UBCC decided to reach out to our allies in bat conservation, the cavers of the National Speleological Society. As a member of both organizations, I was asked to find a way for cavers to report bat sightings to the UBCC. Rather than ask grotto (caving club) chairpersons, I decided to create a Google Form where any caver could enter information at any time.

The Utah Bat Habitat Survey form has fields for cave name, cave type, date of sighting, county, distance from cave entrance, number of bats observed, cave temperature, cave humidity, and responder's contact information. All fields are voluntary.

Cave locational information is sensitive, and tightly controlled by cavers and land managers alike. There was some concern that cavers might feel threatened by an organization made up of mostly government employees asking for sensitive cave information. For this reason, the form only asks for the county where the cave is located. Unfortunately, throughout the history of the response to WNS, cavers have often been treated poorly by wildlife and land management agencies.

Cavers have been one of the most valuable partners in protecting bats for many years before WNS. Cavers have long abided voluntary closures for hibernation and maternity roosts. Cavers have provided volunteer services to agencies including bat surveys, building bat gates, cave restoration, and public education. It is regrettable that after cavers discovered WNS and reported it, that they were treated as pariahs by some agencies and shut out of the public resources that they love and long provided volunteer monitoring for. Even worse was when cavers began to be blamed as the cause of WNS by agencies in interviews with the media. In some cases, cavers were asked to provide lists and locations of caves "in order to help the bats". Many cavers were dismayed when

these very same lists were used to close all caves across entire regions. The damage that has been done to caver/agency relations by heavy-handed and misinformed management actions will take many years to heal.

Keeping all this in mind, I knew that any further requests for information from cavers would have to be handled in a sensitive manner. I attended a joint meeting of the Utah Grottos and explained who the UBCC is and why they are collecting this information. I also explained that any and all participation is voluntary and will not be used as a hit list in order to close caves. The idea was well-received once it was discussed and concerns alleviated.

To date, response has been somewhat slow, but this is partly due to the annual slowdown in Utah caving due to winter conditions. Another hindrance has been trying to get more exposure for the link to the reporting form. I posted it on the Utah Cavers list-serve, and presented it at the meeting, but I think for most folks it tends to fade from memory. I am currently working with the Salt Lake Grotto to get a link to the Bat Habitat Survey Form onto their home page.

Even with these hurdles, 22 responses have already been submitted, providing the UBCC with valuable information on previously unknown bat roosts. I am hoping that with more promotion and visibility, the form will see more use, provide agencies with much needed data, and perhaps even help to repair the bridge of partnership between cavers and and natural resource managers.
~ Andy Armstrong

CANADA

British Columbia

Bats and Cavers Program

Learning what constitutes critical winter habitat and normal hibernation behaviours for western bats will be fundamental to mitigating the devastating disease and facilitating future population recovery post-White-nose Syndrome. Fourteen species of bats hibernate in western Canada; at least eight of these species hibernate but hibernacula have yet to be located. WCS Canada is developing a new program called "Bats and Cavers." This program will be modelled on a similar and highly successful Montana program, where biologists teamed up with cavers to seek out new hibernacula and monitor bats for changes in population size, species diversity, and appearance of WNS disease.

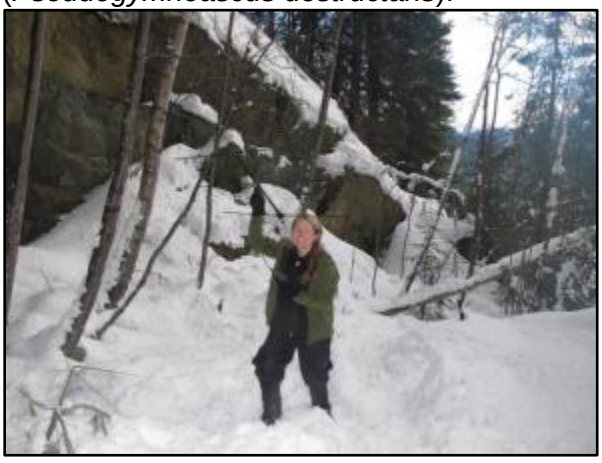
West Kootenay Search and Rescue member, together with caving guide, Kevin Stanway, explore a deep mine suspected of having hibernating bats in southern BC. This mine is now known to have at least 4 species overwintering, and while numbers seem large, an estimate has not yet been possible. Netting here during winter has captured free-flying bats, including a big brown bat banded in Idaho. Photo: C. Lausen

The premise of this program is two-fold: 1) Need to locate more bat hibernacula, and caves are numerous and unexplored, especially during winter when bats are hibernating; 2) Would like to establish whether humans have already tracked the fungus into popular caving destinations in B.C. With regard to the latter, there are many caves popular in B.C. used by Canadians and foreign cavers. To date there has been little to no regulations on using gear in these caves and thus if the fungus causing White-nose Syndrome could possibly have been transferred already to this province it seems likely to show up in

these well-used caves along well-trodden paths.

This project will hire a program co-ordinator and develop a website specifically to connect the caving communities in BC, Alberta, Yukon and NWT, with western bat biologists. There are 2 basic arms of the Bats and Cavers Program: 1. Baseline fungal sediment testing of western caves; 2. Discovery and monitoring of cave hibernacula. The former arm is already under way with soil samples being collected by cavers/biologists in BC and AB.

These samples are being analyzed using fungal culture techniques in Dr. Ann Cheeptham's lab (Thompson Rivers University, Kamloops, BC), and will be genetically analyzed in the Animal Health Centre in Abbotsford, BC (Dr. Hein Snyman, Dr. Tomy Joseph, Dr. Chelsea Himsworth). Partners in this program include Ministry of Environment (Dr. Purnima Govindarajulu) and Ministry of Forest Lands and Natural Resource Operations (Dr. Helen Schwantje). Soil samples from several popular BC caves will be tested for the presence of WNS fungus (*Pseudogymnoascus destructans*).



Cori Lausen, radiotracking a silver-haired bat to a mine in West Kootenays. The bat was captured flying in January and roosted in a tree and a mine during the life of the transmitter.

In the second arm of this program, cavers will deploy detectors, examine caves mid-winter when possible, measure relative humidity/temperature in caves, take samples of guano, photos of bats or bat sign such as bones/skeletons, etc. In November, I presented this program at the Alberta Speleological Society AGM, and BC Speleological Federation AGM in April, and collaborators to date include Greg Horne, Dave Hobson, Nicholas Vieira, Martin Davis, Phil Whitfield, Kathleen Graham, Richard Varela, Jeremy Bruns, Kevin Stanway, along with a number of other cavers who have expressed interest in becoming involved. We hope to know about funding this summer/fall allowing us to have a fully functioning program in time for next winter.

-Cori Lausen

Two Townsend's big-eared bats found hibernating in a mine in West Kootenays, B.C. Photo: C. Lausen.

Winter Bat Research Continues in B.C.

I have continued to do bat monitoring, with the help of many colleagues, across southern B.C. This winter's monitoring program was less intensive than usual, focussing mostly on the West Kootenay region of B.C. With the help of the caving groups in BC and AB, some Titley Roostloggers were deployed in caves and mines this past winter. A new mine hibernaculum containing 40 kHz myotis bats was found, and many roostloggers still have

yet to be retrieved as the snow is preventing access in high altitudes. There are few locations known in BC where 40 kHz Myotis overwinter, and thus I will be following up on these this coming winter.

One of our largest mine hibernacula (3 species, ~50 bats) was gated in June 2013, and during winter I verified that all 3 species continued to use the mine: Californian myotis, Townsend's big-eared bat, and silver-haired bats. I tracked the latter species using temperature sensitive transmitters to describe their hibernation/arousal patterns. After 2 winters of tracking I now have enough data to proceed with a publication to describe the winter roosting characteristics and arousal patterns of silver-haired bats.

Finally, I have been compiling microclimate data from known winter bat roosts in BC and Alberta (AB) thanks to collaborators in AB, Northwest Territories, and BC. Ideally it would be great to collaborate with others in western North America to combine datasets on microclimates, assuming that many people have small sample sizes for a few species -- together a large collaborative publication could advance what we know about winter roost conditions in the west. **Let me know if you are interested in co-authoring such a synthesis paper.**

The next step would be to take these microclimate conditions into disease modelling that I will be doing with WCS Wildlife Health program (Bozeman, MT office); these WNS survivorship models will be adapted from those currently being developed by collaborator David Hayman, Smith Fellow, Univ of Colorado.

- Cori Lausen

Cori Lausen monitored Queen Victoria mine in West Kootenays this winter; pictured detector is Titley Roostlogger and the Anabat Express prototype being tested. Photo: C. Lausen.

Gating of Queen Victoria mine in BC. Gating crew consisted largely of members of the Canadian Cave Conservancy (led by Search and Rescue and Wildlife Enclosure design expert Steve Blackmore of Kamloops, BC). Photo: Angus Glass, Nelson, BC.

Long-eared Complex Genetic Samples Requested

Long-eared myotis (*M. evotis /M. keenii*).

The long standing project to resolve the taxonomy of Keen's Myotis is coming to a close. The final year of sampling will take place this summer. Karen Blejwas of AK Fish and Game is funding the completion of this project and will be collecting samples in southeast AK, along with providing field assistance in Haida Gwaii.

Doug Burles of Kamloops, BC and Cori Lausen will be capturing and genetically sampling bats in Haida Gwaii and Hazelton. Cori, Leigh Anne Isaac (Kimberley, BC) and Brandon Klug (University of Regina) will be sampling a few other BC locations. Genetic samples of long-eared bats from elsewhere in the province or in neighboring US states, would be a welcome addition! Please contact Cori, clausen@wcs.org. Thanks!
~ Cori Lausen

Got Bats?

The "Got Bats?" network in BC is being initiated this year modelled on the successful Kootenay Community Bat Project and South Coast Bat Action Team initiatives. Funded by the Habitat Conservation Trust Foundation, this network of 10 community bat projects in BC includes Greater Victoria, Saltspring Island, South Coast, Sunshine Coast, Lillooet, Okanagan, West Kootenay, East Kootenay, Peace and Skeena regions of BC.

The objectives of this project are to:

1) Increase detection of bat roosts in anthropogenic structures through a public education, targeted information solicitation and a reporting program called "Got Bats?"
2) Decrease destruction of bat roosts by encouraging landowners to either protect the roost site or use bat-friendly exclusion methods and installation of alternative roost features
3) Initiate baseline bat population assessment using the Annual Bat Count, a Citizen Science program at multiple sites around BC
4) Enhance bat habitat in human altered landscapes through installation and monitoring of bat-houses.

The network will promote a provincial toll-free number (1-855-9BC-BATS) and website (www.bcbats.ca) for bat reports and communications.
~ Juliet Craig and Purnima Govindarajulu

Kootenay Community Bat Project

The Kootenay Community Bat Project (KCBP) is busy again this year doing outreach activities and landowner visits. Funded by the Columbia Basin Trust and the Columbia Valley Local Conservation Fund, the project will build on its success.

During its five years of activity (2004-06; 2012-present), the KCBP has visited almost 500 private properties to work with landowners who have bat issues, identify the species present, and provide educational material. The KCBP is also promoting the Annual Bat Count, a citizen science initiative to monitor bat populations. In addition, the program delivers community presentations and, in partnership with Wild

Voices for Kids, dozens of school programs each year.

Educators participating in "Bat Workshop for Educators" hosted by the Kootenay Community Bat Project.

Because of the high demand for school programs, particularly around Halloween, the KCBP hosted a "Bat Workshop for Educators" this April. Twenty enthusiastic educators from around the Columbia Basin attended this weekend event which included mist-netting with Dr. Cori Lausen, participating in an Annual Bat Count, and 1 ½ days of classroom activities. As a result, there is now a trained bat educator in every region of the south-east portion of BC who is able to deliver bat school programs.

The KCBP is continuing the "Building Homes for Bats" program which encourages landowners to build and install bat-houses on their property by reimbursing the cost of materials. Funded by the Public Conservation Assistance Fund, the program requires a landowner to install at least two bat-houses to compare a feature (e.g. aspect, style, colour) and then report on success of occupancy. In order to be reimbursed, the landowner is required to submit photos of the installed bat-houses.

To learn more about the Kootenay Community Bat Project and its programs, see www.kootenaybats.com.

~ Juliet Craig

Genetic Identification of *Myotis* Now Commercially Available in BC

Wildlife Genetics International (wildlifegenetics.ca) is now offering identification of Myotis genetic samples. WGI is based in Nelson BC and has over a decade of experience using mitochondrial DNA to identify species. Within western Canadian Myotis, we have used pellet and other samples to positively identify *M. septentrionalis* and *M. yumanensis*, although extreme mitochondrial diversity within *M. lucifugus* would dictate more involved multilocus methods to separate that species from *M. evotis/M. keenii* in some situations. Local reference samples of known species identity analyzed at no charge. Please call or email in advance to discuss sample collection and storage methods.

- David Paetkau

SOUTHEASTERN BAT DIVERSITY NETWORK (SBDN) BAT BLITZ COMMITTEE SEEKS ADDITIONAL PARTICIPANTS!

As most of you probably know, SBDN has had yearly bat blitzes since 2002. Check out our past blitzes page for information (http://sbdn.org/past_blitzes.html). This year is the first time since the beginning of our blitzes that we have not had a dedicated blitz host. This is primarily due to the economic uncertainty of federal and state budgets in the last couple years.

The good news is, we have a great prospect for a traditional blitz in 2015. Instead of skipping 2014, the SBDN Bat Blitz Committee decided to hold a multi-state blitz effort. We ask that each participating state net at least 2 nights during the period of Sept. 4th – 10th, 2014.

We certainly don't expect you to organize a big event like the traditional blitzes! No effort is too small. Even one team out netting is some information. But we hope that states will take the opportunity to get

together and survey some areas of your state that may be lacking information.
If you or additional folks in your state would like more info, please contact me (katrina.morris@dnr.state.ga.us). We're really excited about this opportunity and hope you will be able to participate!

Thanks!

The SBDN Bat Blitz Committee
~ submitted by Trina Morris (GA Dept. of Natural Resources)

NORTH AMERICAN BAT MONITORING PROGRAM UPDATE

The North American Bat Monitoring Program (NABat) is still planning several pilot studies the summer of 2014 (June, July, and August) to test out the protocols and the proposed study design. Many states and agencies have already contacted the team letting them know they are interested in helping out. The NABat plan went through its first peer review and is in draft form for pilot participants to look over. We are currently working out the kinks of the "master sample" of grid cells to survey. We will be contacting everyone who volunteered to participate in late spring and early summer with how to proceed with their pilot surveys by providing the draft protocols and the ordered list of grid cells to survey for their state or land management areas. For more information, please contact Laura Ellison (ellisonl@usgs.gov).

~ Laura Ellison

PDF CORNER

The PDF Corner lists recent open-access publications that may be of interest to WBWG members. If you come across a full-text on-line publication that you think should be listed here, please send the link to lorraine.Andrusiak@keystonewildlife.com.

Silvis, A., Kniowski, A. B., Gehrt, S. D., & Ford, W. M. (2014). Roosting and Foraging Social Structure of the Endangered Indiana Bat (*Myotis sodalis*). *PloS one*, *9*(5), e96937. http://dx.plos.org/10.1371/journal.pone.0096937.g001

Erickson, Richard A., Wayne E. Thogmartin, and Jennifer A. Szymanski. "BatTool: an R package with GUI for assessing the effect of White-nose syndrome and other take events on Myotis spp. of bats." Source Code for Biology & Medicine 9.1 (2014). http://www.scfbm.org/content/pdf/1751-0473-9-9.pdf

Gregory G. Turner, Carol Uphoff Meteyer, Hazel Barton, John F. Gumbs, DeeAnn M. Reeder, Barrie Overton, Hana Bandouchova, Tomáš Bartonička, Natália Martínková, Jiri Pikula, Jan Zukal, and David S. Blehert (2014) Nonlethal screening of bat-wing skin with the use of ultraviolet fluorescence to detect lesions indicative of white-nose syndrome. Journal of Wildlife Diseases In-Press. http://jwildlifedis.org/doi/pdf/10.7589/2014-03-058

Jung, Thomas S. "Attempted predation of a diurnally active Spotted Bat (*Euderma maculatum*) by a Belted Kingfisher (*Megaceryle alcyon*)." The Canadian Field-Naturalist 127.4 (2014): 346-347. http://www.canadianfieldnaturalist.ca/cfn/index.php/cfn/article/viewFile/1517/1535

Neubaum, D., K. Navo, and J. Siemers. "Recommendations for Defining Biologically Important Bat Roosts in Colorado Related to Local Population Persistence." http://www.cnhp.colostate.edu/teams/zoology/cbwg/

Basil, Gladrene Sheena, and Juliet Vanitharani. 2014. "An Extensive Review of Methods of Identification of Bat Species through Acoustics." International Journal of Computer Applications Technology and Research 3.4: 186-192. http://www.ijcat.com/archives/volume3/issue4/ijcatr03041001.pdf

Coleman, L. S., Ford, W. M., Dobony, C. A., & Britzke, E. R. (2014). Effect of passive acoustic sampling methodology on detecting bats after declines from white nose syndrome. Journal of Ecology and The Natural Environment, 6(2), 56-64. http://www.academicjournals.org/journal/JENE/article-full-text-pdf/859932242855

Fritsch, G., & Bruckner, A. (2014). Operator bias in software-aided bat call identification. *Ecology and Evolution*. http://onlinelibrary.wiley.com/doi/10.1002/ece3.1122/full

UPCOMING EVENTS

Canada

Canadian Wind Energy Association (CANWEA). CanWEA's Annual Conference 2014 is being held October 27-29, 2014 in Montreal, Quebec
Annual Conference 2015 is being held October 5-8, 2015 in Toronto, Ontario
http://www.canwea.ca/events/index_e.php

USA

The Wildlife Society 21st Annual Conference, Pittsburgh, Pennsylvania, October 25-30, 2014
http://www.wildlife.org/conferences

Southwestern Desert Bats Class
October 10-12, 2014 Desert Studies Center at Soda Springs (Zzyzx) south of Baker, CA
http://biology.fullerton.edu/dsc/
(Then click on the Maturango Museum Southwestern Desert Bats hotlink for the pdf with class details and registration information)

63rd Annual Wildlife Disease Association International Conference
July 27 - August 1, 2014, Albuquerque, New Mexico.
http://www.wildlifedisease.org/wda/CONFERENCES/AnnualInternationalConference.aspx

AWEA Offshore WINDPOWER Conference & Exhibition, October 7 - 8, 2014,
Atlantic City, NJ
http://www.offshorewindexpo.org/

North American Symposium for Bat Research Annual Meeting, October 22-25, 2014, Albany, NY
http://www.nasbr.org/pdfs/Albany_NASBR_2014.pdf

Elsewhere

4th International Berlin Bat Meeting: Movement ecology of bats
13th - 15th March 2015 in Berlin, Germany
http://www.izw-berlin.de/welcome-197.html

National Bat Conference
University of Warwick, 5-7 September 2014.
http://www.bats.org.uk/pages/national_bat_conference.html

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