Western EcoSystems Technology, Inc.

News from the WEST

Spring/Summer 2010

WEST, Inc.

Environmental & Statistical Consultants

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Inside this issue:

The "Bat Men" of WEST

WEST, Inc. now holds an endangered species recovery permit that allows WEST to conduct research on four federally listed bat species: Indiana bat, gray bat, Virginia big-eared bat and Ozark big-eared bat. The permit authorizes WEST to capture, handle, attach radio-transmitters, and release each species for various studies. Examples of studies that can be conducted under our research permit include presence/absence surveys, studies to document habitat use, population monitoring, and studies designed to evaluate potential impacts of development projects.

WEST is currently conducting presence/absence surveys, population monitoring, and habitat use studies at 11 proposed development projects in Illinois, Indiana, Ohio and Michigan. The results of the research will be used to identify important areas for each species, and will be provided to clients to allow facilities to be designed to reduce potential impacts to federally listed bat species. The permit also allows WEST to identify and salvage carcasses of endangered bat species as part of studies designed to estimate bat fatality rates at wind-energy projects.

WEST is currently conducting studies of bat fatalities at five existing wind-energy facilities within the range of the Indiana bat, gray bat, and Virginia big-eared bat. The data collected by WEST during these studies will help to evaluate potential impacts of wind-energy facilities on federally listed bat species.

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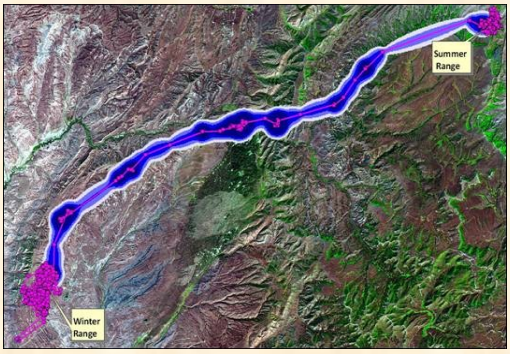
WEST Staff Roll Out New R Package

Ryan Nielson, Hall Sawyer and Trent McDonald created a new contributed package for R (a language and environment for statistical computing). This package fits a Brownian bridge movement model (package 'BBMM') to animal location data obtained by a Global Positioning System (GPS) or Very High Frequency (VHF) device. The model provides an empirical estimate of the movement path of an animal using discrete location data obtained at relatively short time intervals. The package can be downloaded at the CRAN website:

http://cran.r-project.org/



Brownian bridge created for a mule deer migration route

The "Bat Men" of WEST (continued)

WEST continues to be involved in acoustic monitoring for bats at proposed wind energy facilities across the country, and is always interested in promising new methods and technologies related to bat monitoring. Recently, two new full-spectrum detectors designed for unattended monitoring have been introduced. WEST bat biologists worked with WEST statisticians to design a study to rigorously evaluate different bat detectors in side-by-side tests. Testing will continue throughout the summer, with results available in the fall.

At this time WEST has four main Bat Biologists on permanent staff as well as many temporary field technicians who engage in our bat work.

Jeff Gruver joined WEST in 2007. Jeff has been involved in bat research since 1996, and has studied bat ecology in the Pacific Northwest, the Rocky Mountains, and the Badlands of southern Alberta. He earned a B.S. in Economics in 1993 from Penn State University and an M.S. in Zoology and Physiology from the University of Wyoming in 2002. Jeff's Masters research examined the assemblage of bats near a wind power facility in southern Wyoming in relation to documented bat fatalities at the facility. His PhD research focused on the how physiological constraints influence ecological responses of bats in northern arid climates. Jeff has authored or co-authored scientific publications on topics ranging from species conservation assessments to factors influencing bat fatality risks at wind energy installations.

Donald Solick is a wildlife biologist with over 13 years experience conducting research on bats and other wildlife throughout North America and Canada. He received his M.S. in Ecology from the University of Calgary, Alberta, and his B.S. in Wildlife Biology and B.A. in Environmental Studies from The Evergreen State College, Washington. With WEST, Donald is primarily involved with coordination, field work, data analysis, report-writing, and support for bat surveys. His background in bat research is extensive, and includes acoustic monitoring surveys (using Anabat, Pettersson, and Binary detectors) to determine bat activity at proposed wind energy facilities, radio-telemetry studies to determine roosting, foraging, and thermoregulatory behavior, mist-netting and harp-trapping surveys to determine presence/absence of species (including threatened and endangered species), radar and night-vision surveys to monitor bat migration and behavior, and nightly emergence counts of bats at building, mine, and tree roosts.

Stephen Brandebura is a wildlife researcher with a focus on bat ecology. In 2002, Steve received his B.S. degree at Arkansas Technical University and has since participated in several wildlife related studies. He is currently a bat biologist with WEST and completing his Master of Science degree at Arkansas State University. While at Arkansas State University, Steve gained a multitude of experience identifying and describing the roosts used by Indiana bats and extending the known ranges of many of the bats in Arkansas. Steve has substantial experience with bat research. He has mastered many important bat research techniques over the seven years he was involved with bat studies throughout several states. This includes experience with 25 species. He has made important contributions to our knowledge of Indiana bat ecology through his master's thesis research. This research primarily used radio telemetry studies to provide the best descriptions of Indiana bat roosting habitat in Arkansas and document the only known Indiana bat maternity habitat in Arkansas.

Dr. Kevin Murray joined WEST in 2010 as a Bat Biologist in the Bloomington, Indiana office. Kevin is a research biologist whose primary focus has been bat research over the last 10 years. Kevin received his Ph.D. in 2008 from the University of Miami in biology. Kevin received his Master's Degree from Missouri State University where his research focused on the use of Anabat detectors to survey bat communities, including the Indiana bat. Kevin's PhD work focused on the genetic structure and mating system of the buffy flower bat. Kevin has also worked as a research biologist and technician on projects examining water quality in the Ozark Scenic Riverways, bat ecology in the western U.S., and Indiana bat ecology in Missouri. Kevin is currently applying for a research permit to allow him to capture and handle Indiana bat, gray bat, and big-eared bats.

Welcome to the WEST Team

Terry Enk-Wildlife Biologist/Project Manager-Washington Office: Dr. Terry Enk joined WEST in March as a project manager and wildlife biologist based out of the Walla Walla, Washington office. Terry received a B.A. in Biology and Economics from Ripon College in 1985, an M.S. in Natural Resources and Conservation Biology from the University of Michigan in 1992, and Ph.D. in Wildlife Biology from Montana State University in 1999. He has over 15 years of experience in environmental consulting. Prior to joining WEST, Dr. Enk was a Senior Wildlife Biologist for Environmental Planning Group and POWER Engineers in Boise, Idaho. His experience includes work as the elk biologist for the New Mexico Department of Game and Fish and Principal Investigator on a mountain lion study in Jackson, Wyoming.

Terry has extensive experience in managing biological resource investigations for wind energy developments, transmission lines, pipelines, and highways and trail projects. He has broad experience with wildlife surveys; including baseline inventories, habitat assessments, general wildlife investigations and surveys for threatened, endangered, and sensitive species. This work has included various methods of animal capture and handling, collection of biological samples, aerial and ground telemetry, data analysis, and the preparation of summary reports.

With WEST, Inc., his primary duties include management of pre- and post-construction biological resource surveys for wind energy projects throughout the Pacific Northwest region. Terry lives in Walla Walla and enjoys spending time with his family, traveling, and fly fishing in the great outdoors.

Kevin Murray-Bat Biologist-Indiana Office: Dr. Kevin Murray joined WEST in May as a Bat Biologist in the Bloomington, Indiana office. Kevin is a research biologist whose primary focus has been bat research over the last 10 years. Kevin received his Ph.D. in 2008 from the University of Miami in biology. Kevin received his Master's Degree from Missouri State University where his research focused on the use of Anabat detectors to survey bat communities, including the Indiana bat.

Kevin received his PhD from the University of Miami where he studied the genetic structure and mating system of the buffy flower bat. Kevin has also worked as a research biologist and technician on projects examining water quality in the Ozark Scenic River ways, bat ecology in the western U.S., and Indiana bat ecology in Missouri.

Kevin is currently applying for a research permit to allow him to capture and handle Indiana bat, gray bat, and big-eared bats. When not chasing bats, Kevin enjoys hiking, searching for wildflowers, visiting national parks, books, television, and movies.

Andy Krause-Biologist-California Office: Andy Krause joined WEST in April as a biologist in our California branch office. Andy received his Bachelor of Science from California State University focusing on Wildlife Conservation Biology. He has experience working with Anabat and Mist Netting in work with bats. Andy served as the lead field technician with Oak Creek Energy systems from 2007 to 2009. He also served as a research assistant while at California State University.

With WEST Andy will be performing bat liaison duties, Anabat data analysis; he will also perform fatality monitoring, surveyor efficiency studies, scavenger studies, bat roost surveys, and night vision surveys.

In his free time Andy enjoys archery hunting and fishing and spending time at his cabin in the Sierra Nevada's.

WEST Celebrates 20 Years of Providing Scientific Solutions to Natural Resource Problems

In July of this year, Western EcoSystems Technology, Inc., or WEST, as we are more familiarly known, celebrates its 20th anniversary. In July 1990, Dale Strickland and Lyman McDonald decided to combine their significant talents and experience to create a unique type of environmental consulting company that combines the disciplines of statistics and ecology to address an enormous variety of natural resource challenges.

Over the years, WEST has grown from the original two partners to an organization that employs over 200 professionals and operates six offices across the U.S. Even though WEST has experienced phenomenal growth, our culture remains that of a small company where all team members have a voice and our clients can still pick up the phone and easily reach even our most senior staff.

WEST has seen many milestones over its 20 years, but one of the most recent is possibly one of its most ironic. One of the first projects that WEST was involved in was the statistical analysis and study design for the Exxon *Valdez* oil spill Natural Resource Damage Assessment. In 2010, WEST finds itself again assisting with another oil spill in an environmentally sensitive area, the *Deepwater Horizon* spill in the Gulf of Mexico. Although it is ironic to find ourselves involved in this type of similar circumstance 20 years apart, we are pleased to have the experience and expertise necessary to help effectively address them both.

In addition to our work with natural resource damage assessments, WEST continues to be an industry leader in several other areas including the application of statistics to wildlife studies, evaluating the impact of natural resource development on the environment, wetlands inventory, threatened and endangered species studies, vegetation and sensitive plant studies, and marine mammals.

We are proud of our accomplishments and look forward to new challenges and areas of opportunity. As we continue to grow and expand our areas of expertise, we will maintain the same level of professionalism and scientific neutrality that has been a key factor in our success thus far.

We have many new and exciting changes coming, so we will be sure to keep you posted. As always, we appreciate your interest and support and look forward to the next 20 years!

WEST Offers Assistance in Gulf Oil Spill

Statisticians from WEST are providing statistical design and analysis advice to the National Oceanic and Atmospheric Administration's (NOAA) Natural Resource Damage Assessment (NRDA) effort following explosion of the Deepwater Horizon drilling platform.

The subsequent oil spill has now eclipsed that of the spill that was one of WEST's initial projects, - the Exxon *Valdez* spill.

We will cover more details of our work in the Gulf Coast Oil Spill as it continues. Look for this information to be featured in future newsletters

Recent Publications

Johnson, G.D. and S.E. Stephens. 2010. Wind Power and Bio Fuels: A Green Dilemma for Wildlife Conservation. Chapter 8 *In*: Energy Development and Wildlife Conservation in Western North America. D. E. Naugle, Ed., Island Press, Washington, D.C. In Press.

Johnson, G.D. and M.J. Holloran. 2010. Greater Sage-Grouse and Wind Energy Development: A Review of the Issues. Renewable Northwest Project, Portland, Oregon.

Liebezeit, J. R., S. J. Kendall, S. Brown, C. B. Johnson, P. Martin, **T. L. McDonald**, D. C. Payer, C. L. Rea, B. Streever, A. M. Wildman, and S. Zack (2009) "Influence of human development and predators on nest survival of tundra birds, Arctic Coastal Plain, Alaska", Ecological Applications, v19(6), p. 1628-1644.

Koski, W. R., T. Allen, D. Ireland, G. Buck, P. R Smith, A. M. Macrander, M. A. Halick, C. Rushing, D. J. Sliwa, and **T. L. McDonald**. (2009) "Evaluation of an unmanned airborne system for monitoring marine mammals", Aquatic Mammals, v35(3), p. 347-357.

Durner, G. M., D. Douglas, **R. Nielson**, S. C. Amstrup, **T. L. McDonald**, I. Stirling, M. Mauritzen, E. Born, O. Wiig, E. DeWeaver, M. Serreze, S. Belikov, M. Holland, J. Maslanik, J. Aars, D. Bailey, and A. Derocher., (2009) "Predicting 21st Century Polar Bear Habitat Distribution from Global Climate Models" Ecological Monographs, v79, p. 25-58.

For additional listings of other WEST, Inc. publications please visit:

http://www.west-inc.com/reports.php

Conferences, Training and Workshops

Dale Strickland, Dave Young, Wally Erickson, and **Tiffany Lyon** attended the American Wind Energy Association (AWEA) WINDPOWER 2010 Conference and Exhibition, May 23rd thru 26th. The conference which features over 20,000 attendees, is the largest energy trade show in America and the world's largest wind energy conference.

Ryan Nielson has been involved in a large project aimed at developing and testing new elk habitat selection models for western Oregon and Washington. This project incorporates new knowledge, especially of elk nutrition and foraging dynamics, in a resource selection function approach to predict where elk will occur across large landscapes. The new models will benefit current land management plan revisions and habitat management and restoration for elk across western OR and WA. The first of two planned workshops was held in Corvallis, OR April 19 - 20, and over 120 biologists and land managers attended. Details on this project and presentations from the workshop can be found at http://www.fs.fed.us/pnw/calendar/workshop/elk/index.shtml .

Greg Johnson recently gave a presentation titled "Sage-grouse and wind energy development: A review of the issues." Greg was invited to present at the Renewable Northwest Project Board of Directors Meeting in June 2010 in Portland, Oregon.

Jeff Gruver, **Wendy Tidhar** and **Greg Johnson,** attended "Habitat Conservation Planning for Endangered Species", a course taken at the U.S. Fish and Wildlife Service National Training Center in Shepardstown, West Virginia, June 14th thru 18th.

For a listing of other upcoming workshops visit:

http://www.west-inc.com/workshops.php

Green Tip: Preventing Ground Level Ozone

Unlike the good, protective ozone layer in the stratosphere, ground level ozone is a harmful air pollutant that affects all of us. It's formed when emissions from everyday items combine with other pollutants and "cook" in the heat and sunlight. Sources of such emissions include local industry, gasoline-powered vehicles and lawn equipment, and household paints, stains and solvents. Weather plays a key role in ozone formation. The highest ozone levels are usually recorded in summer months when temperatures approach the high 80s and 90s and the wind is stagnant or light.

At ground level, ozone is a health hazard for all of us, especially the young and elderly. Those who are active and exercising outdoors may experience breathing difficulties and eye irritation. Prolonged exposure may result in reduced resistance to lung infections and colds. Ozone can also trigger attacks and symptoms in individuals with pre-existing conditions, like asthma or other respiratory infections like chronic bronchitis and COPD (Chronic Obstructive Pulmonary Disease).

Follow these simple, easy steps to help reduce harmful emissions during ozone pollution season:

- Delay mowing your lawn until evening-when temperatures are lower
- Maintain your lawnmower, keep it running in top condition so it runs cleaner, thus reducing its emissions
- Keep your vehicle tuned up and tires inflated, this will increase mileage thus reducing the need to refuel
- Refuel in the evening, so the fuel vapors don't have a chance to "cook" into ozone
- Avoid idling your car unnecessarily while waiting in parking lots or service lines, turn off your engine instead
- Plan major painting, stripping, and refinishing projects for spring and fall to avoid summer heat and sun which react with the vapors from those products to create ground level ozone
- Monitor the ozone levels in your area and plan outdoor activities accordingly

Source:www.ozoneaware.org

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