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# LAND INFORMATION *Bulletin*

from the National Consortium for *Rural Geospatial Innovations*  
Pacific Northwest, Central Washington University

## Tracking Cougars with Project CAT

*Geospatial technologies have become  
valuable teaching tools*

*The Consortium for Rural Geospatial Innovations (RGIS-Pacific Northwest) places considerable emphasis on education as a means for reducing the digital divide in rural Washington. A key component has been Project CAT (Cougars and Teachers), an ongoing, multi-partner project aimed at providing opportunities for K-12 schoolchildren, teachers, administrators and community members to learn about geospatial technologies and use them to map and model cougar habitat and behavior. Community involvement in Project CAT has generated interest in using geospatial technologies as teaching tools by the College of Education and Professional Studies at Central Washington University. RGIS-Pacific Northwest is currently developing GIS curriculum for teachers involved in this program.*

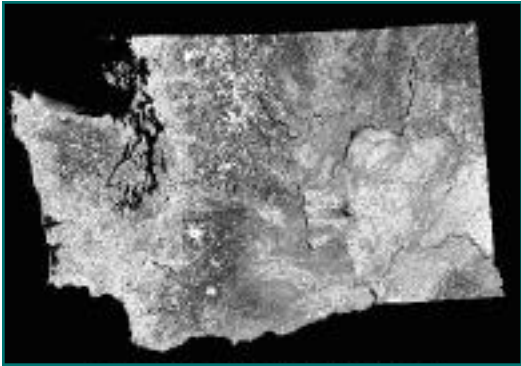
Last January—on a typical snowy day in Banff, Alberta, Canada—a female cross-country skier was attacked and killed by a cougar. Some citizens felt “it was definitely a predatory attack,” while others thought that such bizarre incidents are “caused by (urban) development and reduction of habitat.” Ian Syme, chief park warden of Parks Canada said cougars around Banff are competing with an 11-member wolf pack for elk. As a result, the elk move closer to town bringing the cougars with them (Banff *Crag & Canyon News*, Jan. 12, 2001). Whatever the reason for the Banff killing, it is clear that cougars and other wildlife are encroaching on human settlements.



As in Canada, loss of wild land and competition for food in the Pacific Northwest has increased pressure on cougars and other wildlife populations that require a sustainable habitat. Normally found in remote, mountainous terrain, cougars are observed more and more frequently around the fringes of rural towns and city suburbs. In Washington, human-cougar interactions have increased dramatically over the past five years. While many incidents between humans and cougars are merely sightings, there has also been an increasing threat to the safety of humans, livestock and pets.

To help manage this impressive creature, Washington State Department of Fish and Wildlife (DFW) biologists are eager to understand more about cougar behavior. Their aim is to better understand why cougars are encroaching on human-populated areas—both to protect the cougar, and to reduce the potential for tragic encounters such as the Banff attack. To make more sense of this issue, DFW biologists need data on specific, localized

**Figure 2.**  
A LANDSAT image of Washington state



**Figure 3.**  
Tagging a cougar with a GPS and radio collar



cougar populations in rural and suburban settings. Because detailed information is lacking, management options for mitigating human-safety concerns are not tailored to, or available for, individual cougar populations. To address this problem, the DFW has begun working with Project CAT (Cougars and Teachers) partners. The partnership gives students and teachers a unique opportunity to research cougars and their habitat using GIS and other geospatial technologies, while providing DFW researchers with valuable information.

### Preparing Teachers and Students

Pre-service and in-service teachers have been instructed in NatureMapping techniques and skills. (NatureMapping is a state-wide program for teachers working in conjunction with Washington Fish and Wildlife managers; see [www.fish.washington.edu/naturemapping/](http://www.fish.washington.edu/naturemapping/)). The NatureMapping workshops establish a foundation for teachers and students to understand spatial concepts as they collect and record data. It also helps them understand how data are used to analyze, determine, and predict changes in animal habitat. For example, teachers and students are learning how to read maps, investigate habitat, identify cougar scat and tracks, and to understand the importance of collecting and entering data into a spatial information system. They also learn how data obtained from maps and remote sensors such as LANDSAT can be used to delineate cougar habitat (Figure 2).

The Department of Fish and Wildlife provide instruction and support to ensure that project participants collect, record and maintain data required for valid and reliable analysis. Also, the department—with strict safety precautions—uses students to help capture and handle cougars, some of which will be tagged with GPS and radio receivers so students can track their territorial movements (Figure 3).

## Goals of Project CAT

- Increase student learning through involvement in an authentic research study;
- Foster problem-solving skills and instill in students a world view that reflects an understanding of the importance of science in their everyday lives;
- Develop an awareness of and expertise in the use of geospatial tools and technologies to empower students to understand, and participate in, decisions affecting their environment, economy and quality of life;
- Acquaint students with geospatial career options and how school relates to those options in a rapidly changing work environment;
- Provide continuous and sustained staff development for teachers and pre-service teachers in inquiry-based integrated instructions and related geospatial technologies;
- Develop service learning/community service components, which will involve and educate the greater Cle Elum community in collaborative, inquiry-based education processes and their application to informed decision-making;
- Create a video documentary of the collaborative cougar research project to make similar projects replicable in other regions/school districts throughout our nation;
- RGIS–PNW will use Project CAT experience and methods as RGIS sites participate in developing national 4H geospatial curriculum;

**Figure 4.**  
Students use a GPS to home in on a



**Figure 5.**  
Younger students look for signs of a cougar in the field



**Figure 6.**  
Pre-service teacher training at  
Central Washington University



## Broadening Involvement

In addition to student exposure to Project CAT in the NatureMapping program, Central Washington University's Center for Teaching and Learning (CTL) has partnered with Kittitas Valley school districts to form Kittitas Valley Professional Development Schools (KV-PDS). The professional development curriculum serves three schools (Cle Elum-Roslyn Elementary, Walter Strom Middle School, and Cle Elum-Roslyn High School), and is designed to provide continuing education and professional growth for in-service and pre-service teachers and college professors through workshops and other learning opportunities. The partnership program and Project CAT focus on integrating technologies such as GIS (geographic information systems) into the curriculum. Teachers are trained to use the technologies as tools that can help answer scientific and research questions, and address spatial and other problems.

Participants at the three schools include students, teachers, administrators, professors, scientists and community members. Administrators and master teachers participate on the site-planning team, assessing district needs, establishing project vision, creating goals and setting direction. Master teachers serve as mentors for pre-service teachers, providing a comprehensive field experience that includes multiple teacher roles and an inside look at school culture and procedures. Pre-service teachers, in turn, help in-service teachers integrate GIS and other instructional technologies into the curriculum.

Each grade level within participating schools has one project leader who organizes curricula with other teachers in the same grade level. Primary and intermediate students learn to identify paw prints, food-chain and general habitat facts. Middle and high schoolers examine complex habitat and behavior issues; they also input information and manipulate data, help capture and collar cougars in the field (under the supervision of DFW biologists), then track them using a GPS (Figure 4). Students from all grade levels collect field data such as tracks and habitat patches, and enter the data into a GIS (Figure 5).

RGIS-PNW is assisting in processing these data, formatting them for GIS, and producing maps. K-12 students are currently formatting a GIS Website to display their findings and further educate the community about the research and possible solutions to this complex environmental issue. They provide links on the Website with Project CAT.

## A Strong RGIS Link

Project CAT has been instrumental in establishing links between RGIS-Pacific Northwest and the College of Education and Professional Studies at Central Washington University. RGIS is currently developing GIS curriculum to enhance pre-service teacher training at CWU (Figure 6). As an integral partner in Project CAT, RGIS-Pacific Northwest is:

- providing teachers with training in the function and application of GIS and GPS to facilitate the use of such technologies in science methods instruction and K-12 teaching,
- helping the Department of Fish and Wildlife develop predictive models of cougar movement,
- where possible, providing critical data for other modeling carried out by Fish and Wildlife managers,

## About RGIS

The National Consortium for Rural Geospatial Innovations–Pacific Northwest (RGIS-PNW) is located on the campus of Central Washington University in Ellensburg, WA. It is a USDA program designed to promote the use of geospatial information and technologies by communities in rural America. RGIS–PNW is dedicated to helping communities understand the concepts and benefits of using geospatial data as well as assist the communities in all aspects of GIS development.

Find out more about RGIS at our Website:  
[www.ruralGIS.org](http://www.ruralGIS.org)

- providing instruction for students in using GPS (global positioning systems) to map scat and tracks in the field, map historic cougar sightings, and to identify home locations of residents being interviewed to determine their perception of cougars (information the students will use to create a danger-perception model), and
- hosting workshops aimed at educating the parents of schoolchildren and the general community about selected technologies and modeling approaches used by K-12 students in Project CAT.

Summer school workshops have been developed and a number of these are available in Summer 2001. A new curriculum will include data and methods developed for Project CAT, and will be expanded over the next three years to include watershed modeling and business applications.

Partners in Project CAT include: Cle Elum-Roslyn School District; Central Washington Professional Development School (Central Washington University); Washington State Department of Fish and Wildlife; University of Washington NatureMapping Program; The Hornocker Wildlife Institute; and RGIS-Pacific Northwest. RGIS provides leadership in identifying funding sources and preparation of proposals. Agencies or foundations interested in assisting CAT should contact Graeme Aggett, Director of the Center for Spatial Information (RGIS-PNW) at Central Washington University; [aggettg@cwu.edu](mailto:aggettg@cwu.edu); ph: 509-963-1625.

*This Bulletin was prepared by Graeme Aggett and Heather Stringfellow at the National Consortium for Rural Geospatial Innovations–Pacific Northwest, Central Washington University, Ellensburg, WA. Additional support provided by the USDA Cooperative State Research Education and Extension Service (CSREES).*

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