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CoyoteBytes.org: A NEW EDUCATIONAL WEB SITE

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Abstract: A web site, www.CoyoteBytes.org, has been developed as a tool to provide science-based management recommendations to homeowners and municipal officials on methods to reduce conflicts with coyotes (*Canis latrans*) in urban and suburban areas. Such conflicts include aggression toward or attacks on children and adults; attacks on pet dogs and cats; attacks on hobby animals, such as poultry, sheep, and goats; and damage to drip irrigation systems, garden crops, and to other resources. In addition to providing information, the website allows individuals to upload photos or video clips of urban and suburban coyotes, and to submit first-hand reports detailing the circumstances surrounding such conflicts. The information that will be collected concerning coyote encounters and incidents should, over time, provide a means for a more complete analysis of this problem, thereby improving our management recommendations.

Key words: *Canis latrans*, coyote, coyote attacks, coyote-human conflict, Internet, predator management, suburban environment, urban environment, website

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INTRODUCTION AND PURPOSE

The creation of the web site Coyotebytes.org (http://www.coyotebytes.org) was in response to recognition of two needs: 1. A need for educational materials, on management strategies for urban and suburban coyote (*Canis latrans*) conflicts within California, to be readily available to homeowners, land managers, city and regional decision-makers, and others; and 2. A need to capture better, more complete information on coyote-human conflicts occurring in urban and suburban environments within California.

As a partial response to these needs, the CoyoteBytes web site was conceived in late 2006 and will debut by summer 2007. This web site will contain science-based management recommendations and research information focused on the issue of human-coyote conflicts in California (and more specifically, on the problem of coyote attacks on humans in Southern California), a growing problem over the past 3 decades (Baker and Timm 1998, Timm et al. 2004, 2007). Additionally, this web site will provide a means for individuals to submit first-hand reports on coyote incidents and coyote damage that has occurred. Initially, such reports will be collected from three counties in Southern California: Los Angeles, Orange, and San Diego Counties. We anticipate eventual expansion of the geographic area covered to include all of California.

One of our goals is to provide factual information, based on the best available science and management experience, concerning the management of human-coyote conflicts in urban and suburban environments. We were encouraged by successful past efforts in cities and counties in Southern California that made concerted efforts to inform residents about coyotes,

coyote behavior, and the actions that homeowners and neighborhoods can take to prevent coyotes from becoming so habituated to humans as to become a health and safety risk. For example, the city of Glendale, California, in the late 1980s and early 1990s, achieved success with the educational aspects of a program to teach residents how to reduce conflicts with coyotes (Baker and Timm 1998). Concurrently or subsequently, many cities as well as other entities (e.g., the California Department of Fish & Game, regional park agencies, animal welfare organizations) developed brochures, posters, and other published information on ways to make yards and other landscaped environments less attractive to coyotes, reducing the chance they would be drawn into close association with humans. We seek to make such information more readily available to a wide audience.

Secondarily, we are seeking to use this website as a tool to collect current, more complete information about ongoing incidents of human-coyote conflict. No single agency or organization has obtained or compiled such data over an entire region. Previous publications detailing known incidents of coyote attacks on humans in California have, of necessity, relied on newspaper articles, reports from agencies or organizations, and word-of-mouth reports of such incidents (Baker and Timm 1998, Timm et al. 2004). Such sources are notably incomplete and inconsistent in the types of information reported. We are also aware that these sources provide only a subset (how large is unknown) of all such incidents that have occurred within the state. We believe that a more complete, more detailed set of data concerning coyote-human conflicts over time will better inform management recommendations, as well as provide a better basis on which to discern whether such problems are growing and spreading.

WEB SITE'S DESIGN

Home Page

The website's home page provides a brief overview of the site's features (Figure 1). It notes that website users can do the following: find information about urban coyotes; report a coyote encounter or incident; view a map of coyote incidents; or find links to more information about coyotes.

About Us

The web page "About Us" lists the website's authors and affiliations. On this page, as well as on the logos on all of the site's main pages, clicking on a link or logo will allow the user to jump to web pages associated with the authors or the units with which they are affiliated within the University of California (UC) or other agencies.

Coyote Information

The "Coyote Information" page provides viewable and downloadable publications dealing with the issue of conflicts caused by urban and suburban coyotes. Central to this page is the UC-IPM Pest Note publication "Coyotes" (Timm et al. 2007), which was published in March 2007 and is intended to be an extension-type guide for general audiences, aimed specifically at residents, landowners, land managers, and civic decision-makers in urban and suburban environments of California. While providing general information on the biology and behavior of coyotes in such environments, it also provides management recommendations that can be of significant value in preventing coyote-human conflicts in cities and towns. As with most of the publications viewable on this page, it is available either in HTM format or can be downloaded and/or printed in PDF format.

Figure 1. Home page of website www.CoyoteBytes.org.

Other publications included for viewing or downloading are the California Department of Fish and Game's "Keep Me Wild" poster and brochure about coyotes; the United States Department of Agriculture Wildlife Services' 2-page fact sheet "Urban and Suburban Coyotes" (USDA 2002); and the chapter "Coyotes" from the Prevention and Control of Wildlife Damage (Green et al. 1994).

Also listed are a number of general publications about coyotes that will be of interest to those wanting to learn more about this species' biology, behavior, and natural history. These publications, which are typically available from most city libraries either in their collections or through interlibrary loan, will greatly enhance the average person's understanding of the coyote as a species. It has been documented that people's willingness to tolerate some level of nuisance or damage from wildlife is generally increased as the individual's understanding of the species grows (Miller 1995, Jones et al. 1998). Thus, one of our goals in including these references is to help urban and suburban residences develop a better appreciation for, and perhaps a greater tolerance of, coyotes in urban and suburban settings. We also think that this increased knowledge will enhance residents' understanding of the need to conduct preventive measures to keep coyotes from becoming too habituated to humans and residential resources.

Coyote Gallery

This page is a gallery of digital photos and video clips of urban and suburban coyotes. Web page users can upload their own photos or brief videos of coyotes in suburbia. Persons submitting photos or video clips can choose to credit the photographer by name or to remain anonymous. We request the photo location be identified. After submission, photos and videos are reviewed by the website manager before being added to the gallery, to assure that no inappropriate photos are posted.

Report A Coyote Encounter

This page is the entry point for report forms that allow individuals to provide information on first-hand encounters or incidents involving people and coyotes or their pets or hobby animals. The purpose of this section is to attempt to gather more complete information about the distribution of coyote incidents through time within California (during 2007, limited to the counties of Los Angeles, Orange, and San Diego). We ask about selected details of such incidents or encounters, so that we can better evaluate and understand the factors that cause such conflicts, with the goal of developing better management guidelines to prevent negative coyote-human interactions.

We divide encounters or incidents into 6 broad categories (see Figure 2):

1. Incidents involving coyote aggression or attacks on humans, including cases in which coyotes have come within 20 feet or less of humans.
2. Incidents involving coyote attacks on dogs or cats, including those attacks involving harassment of pets, as well as those resulting in the injury or death of such pets.
3. Incidents involving coyote attacks on hobby animals such as rabbits, poultry, goats, sheep, etc. that are present in suburban settings, including ranchettes and semi-rural properties adjacent to suburban environments.
4. Incidents of disappearance of dogs, cats, or hobby animals, for which the respondent has some evidence that the animal was preyed upon by coyotes.
5. Incidents in which coyotes caused damage to resources within the urban or suburban environment; this might involve, for example, coyotes chewing plastic drip irrigation systems, or coyotes eating fruits, melons, or other garden produce.
6. Incidents simply involving sightings of coyotes in urban and suburban environments. Increased sightings of coyotes in such environments, particularly during daylight hours, can be considered a precursor to more serious nuisance problems and even of serious conflicts, up to and including attacks on pets or on people (Baker and Timm 1998)

Incident Map

The incident map is an Internet-enabled Geographic Information Systems (webGIS) tool, that allows for coyote incidents to be displayed and viewed via a dynamic mapping interface. WebGIS tools have been used many times in the past for increasing public awareness and education, for improving monitoring and management of data for ecological studies, and for harnessing the manpower of the general public for data collection via the Internet (Kearns et al. 2003, Kelly and Tuxen 2003). The CoyoteBytes incident map will enable interested parties, including management personnel and concerned community members, to report on coyote encounters, ultimately allowing for better understanding of coyote habitat in wildland-urban interface areas. Map tools include features that allow the user to zoom in on specific geographic areas; to view, by type of incident and by progress through time, the locations of coyote incidents reported; and to print maps generated by use of the available tools.

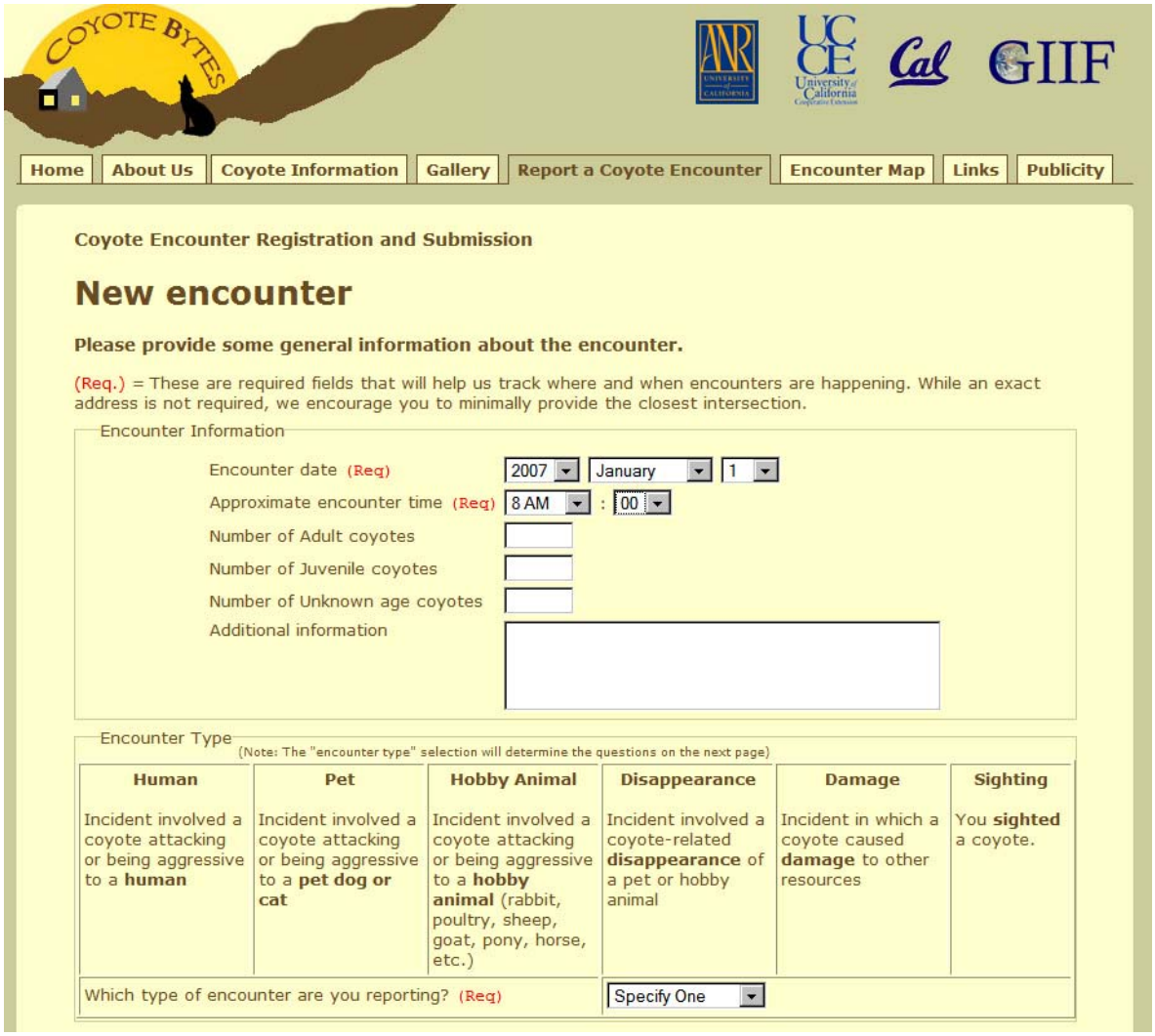

Figure 2. Web form for beginning the process of reporting a coyote incident.

The website was built using ArcIMS (Internet Mapping Services) software, version 9.2 (Environmental Systems Research Institute – ESRI, Redlands, CA). The software enables maps and spatial datasets to be accessible online at all times through any Internet browser. As a result, no special GIS software is needed, enabling those that are less GIS-savvy to access and interact with the coyote data. The CoyoteBytes incident map is integrated with the report form, as well as the rest of the website, and will depict those coyote encounters and images/videos that are submitted via the website, using submitted location information. In addition to submitted coyote encounters and images, numerous datasets are available for viewing and customizing the incident map, including county, park, and urban area boundaries, river, highway, and street networks, and elevation and topographical maps for easy location reference. Currently, the geographic area is limited to Los Angeles, Orange, and San Diego Counties.

An example of a map, generated by data inputted by incident reports, showing locations of such incidents is shown in Figure 3.

Figure 3. Example of a map, generated by hypothetical incident data reported to the website, showing locations of coyote incidents.

Links

This web page provides links to other web sites that contain information or resources concerning urban and suburban coyotes. It is currently subdivided into information general to California, and information pertinent to the three pilot counties.

CoyoteBytes Promotional Tools

This page displays types of materials available to promote the use of this web site. Currently, these include business cards and card holders, and posters in two sizes. An order blank for these materials is provided, so that individuals, agencies, businesses, and others who wish to assist in making known the availability of this website can order these items. Additionally, this page provides access to a general news release describing the website project, as well as a briefer news article about the website that is suitable for use in newsletters.

Further Plans

At some point in the future, the information collected from this web site on coyote incidents and encounters, with the use of GIS technologies, can be used to evaluate such incidents according to a variety of criteria or common factors, including…

1. by type of incident / damage
2. by habitat or proximity to certain resources or geographical features
3. by city or county (which may employ differing coyote management strategies)
4. through time
5. in space (to show range expansion of coyotes, or locations in which bold

behaviors in coyotes are beginning to develop)

Website Promotion and Advertising

Initially, plans are to advertise the availability of the website through a focused effort in Los Angeles, Orange, and San Diego Counties upon the web site's inauguration. We will utilize contacts available through UC Cooperative Extension offices in these counties, county Agricultural Commissioners' offices, municipal and county animal control agencies, the California Department of Fish and Game, USDA Wildlife Services, and other organizations and entities. In addition to utilizing local media outlets in these counties (newspaper, radio, and public access cable television), we will provide our business cards and posters to likely points of contact for individuals who have experienced attacks on pet, such as 24-hour veterinary clinics and animal hospitals, and municipal police departments.

ACKNOWLEDGEMENTS

The idea for this web site grew out of a discussion with my colleague Greg Giusti, who was familiar with the web site created by Maggi Kelly, at UC Berkeley, for the purpose of collecting observations of the spread of sudden oak death in Northern California. I am grateful to Maggi Kelly and her lab, especially to Karin Tuxen-Bettman, for turning our original concept into a functioning web site. Additional project cooperators Craig Coolahan and Ray Smith provided support and encouragement to apply for funding for this project, as well as feedback on the specific ways to make the web site most useful.

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