WILDLIFE CROSSING DATABASE PLATFORM

DESCRIPTION OF THE TOOL AND SUMMARY OF RESEARCHER/PRACTITIONER FEEDBACK

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THE WILDLIFE CROSSING DATABASE PLATFORM

The wildlife crossing database platform (WCDP) is online tool that can be used to upload, access, and explore data on wildlife crossings in North America. The WCDP website is currently in a beta phase, and the beta version is only accessible to registered users; however, the intention for the next version of WCDP is to have some aspects open to the public. The purpose of having both registered users and (some) public access is to create a tool that can meet two needs for landscape connectivity planning: (1) information sharing among practitioners, and (2) public engagement. WCDP is accessed using the following link, and its features and website pages are described below.

www.changingtheconversation.ca/safe-passages

The main database interface page features a zoomable map with data points of wildlife crossings, an expandable/collapsible table of the data, and a button to download a CSV file of the data. Clicking a data point in the map opens a pop-up box with information on the crossings.

The enter data page provides a data entry form, where users can submit information on wildlife crossings using either text fields or multiple-choice buttons. Multiple-choice input can be used to create filter functions on the data maps (e.g., filter points to show just overpass crossings).

The download new data page allows users to retrieve a CSV file of data that have been entered through the data entry form but have not yet been added to the database. Site moderators can examine new entries to see whether the data were entered by WCDP users or spammers/bots

The update database page features a directory with a file containing the wildlife crossing dataset and an Excel workbook with functions and macros for correctly formatting the data. Users copy and paste new data into the workbook, run the macro to produce a new dataset file, and then replace the dataset file in the directory to update the wildlife crossing database.

The public map page features a zoomable map with data points of wildlife crossings and a button that allows users to retrieve an embed code for sharing and displaying the map on different websites. The public map links to the same dataset as the user interface map and data table, but it differs in terms of amount of information shared and precision of crossing location points.

The discussion forum allows users to post thoughts, questions, and comments about landscape connectivity efforts and the WCDP tool. Users can reply to posts to build conversation threads.

The virtual worktable features a Padlet canvas that can be used to post comments, pictures, and links. Different posts can be linked to one another using connector lines.

The resource library consists of a file directory with folders for reports, images, presentations, articles, etc. Users can upload resources and create new folders to organize these resources.

The chat widget is an instant messaging tool that can be accessed from any WCDP page, and it is used to send messages to other registered users who are logged into the WCDP site.

THE VIRTUAL DISCUSSION

A virtual discussion was held in late-March 2020 to discuss considerations and recommendations for further developing WCDP and creating an effective tool for supporting landscape connectivity efforts. The discussion included researchers and practitioners from various places in North America, and it consisted of people working in conservation, environmental education, landscape architecture, local planning, and academia. The session began with participant introductions followed by a short presentation on the research project and brief tour of the WCDP site. Participants then engaged in a discussion that was loosely guided by the following questions:

> - *Is this platform useful to you (or other groups/organizations that you work with)? If so, how could you use it to support your work?*
>
> - *What are the platform's strengths, and what is missing or could be improved?*
>
> - *What information should be shared through the public map, and what should be withheld (i.e., kept password-protected)?*

A number of ideas and recommendations emerged from the discussion. These ideas have been organized into four themes, and are discussed in the sections below.

1. Differences in access and functionality between users and the public

1.1 **Open chatrooms are advised against**, as these type of chatrooms typically attract spam and trolling comments. Supporting this point, many news outlets have felt the need to close their public comment features due to increases in online spamming and trolling trends.

1.2 **WCDP could provide valuable opportunities for crowdsourcing data**, but the full set of questions listed on the data entry form is too extensive for soliciting information from the general public. The public could instead input data simply using a button that allows people to e-mail a suggestion for adding a wildlife crossing to the database. Alternatively, a data entry form could be made available to the public, as long as the number of questions were reduced and the questions primarily consisted of multiple-choice entries. It is important to recognize that any crowdsourcing feature added to WCDP will require content moderation (and a website administrator) to ensure only appropriate content is added to the database.

1.3 **Who should be part of the registered user group?** When crowdsourcing information and creating opportunities for citizen science, the lines between the "users" and "public" can become blurred. For example, should a student research assistant or a highly engaged volunteer be granted the same level of access as practitioners? In addition, landscape connectivity is an interdisciplinary field, which creates challenges around how to define "practitioners" in this field. Broad inclusion in registered user groups could be problematic, as some organizations and agencies may be hesitant to share certain types of data widely.

1.4 **The geographical extent and reach** of WCDP focuses on wildlife crossings in North America; however, innovative landscape connectivity efforts are being done in places throughout the world. Speaking strictly in terms of technical functionality, WCDP has the capacity to incorporate and display data from any location on Earth, but expanding the scope and usership once again presents questions around whether detailed (and potentially sensitive) information can be stored in the database if access is granted too widely.

2. Effective sharing of lessons and success stories

2.1 **A tool for sharing lessons among practitioners**, who have experience implementing wildlife crossing projects, is invaluable. Examples of such lessons include ensuring passages are large enough to accommodate all relevant local species (such as moose with large antlers) and advice on the best (and least expensive) crossing solutions for streams. The data entry form could be simplified to focus on key lessons and guidance for other practitioners.

2.2 **Broadcasting landscape connectivity work and success stories** is useful for increasing political will for connectivity projects and implementation of crossing structures. Decision-makers are generally more inclined to invest in strategies that have been previously tried and are proven to work. A tool that displays wildlife crossing examples (and evidence of effectiveness) could help both practitioners and the broader public advocate for these strategies. However, in places where many crossings have already been constructed, highlighting this work can hold some risk of unintentionally communicating to decision-makers that enough has been done in this area.

2.3 **Visual communication is effective**; such communication methods speak to audiences by "showing" rather than just "telling". Sharing images of wildlife crossings, design drawings, wildlife using crossings, etc. can be a powerful means for communicating the potential of effective crossing strategies, particularly when attempting to engage diverse audiences with limited attention span for detailed data. Visual communication is useful for public engagement, as most people will never physically visit the crossings and visuals can provide more salient impressions of these structures than numeric and/or text-based information.

3. Considerations and challenges for communicating crossing information

3.1 **Target species for crossing structures is important information** for landscape connectivity practitioners. Such information could be collected through dropdown boxes or multiple-choice questions that present Latin names in order to avoided confusion associated with differences in local/regional common names. Inputting species information using multiple-choice questions would also open opportunities to filter map data by target species.

3.2 **Involvement in and ownership of crossing projects and associated land can shift** throughout the life of a project, which creates difficulties for constraining data entry and collecting data on funders, managing agencies, and ownership using multiple-choice questions.

3.4 Data entry questions are heavily focused on transportation networks, and in many ways, the beta version of WCDP presents landscape connectivity practices as a component of transportation development rather than a broader set of strategies and policies. Although transportation networks are critical considerations for connectivity, maintaining the focus solely on transportation networks can obscure other areas where wildlife passages and ecological connectivity are needed.

3.3 Carefully consider financial cost information in terms of the sources of this information and how it is communicated. If recommendations and cost estimates are based on academic sources, it would be worthwhile to consider whether crossing designs can be adjusted to a particular local case or context in a manner that reduces costs. In addition, cost estimates specifically associated with the wildlife aspects of infrastructure development should be clearly communicated, rather than just reporting the aggregate cost for infrastructure.

4. Landscape connectivity beyond wildlife crossing infrastructure

4.1 Wildlife crossings are only one aspect of landscape connectivity, and a broader view of connectivity would incorporate ecological components that facilitate animal movement, such as vegetation, ravines, parks, etc. In some ways, the use of points for representing data in the WCDP map interface can be limiting, as points can present wildlife passages as a series of separate and disconnected features.

4.2 Non-wildlife infrastructure can facilitate wildlife movement, examples being pedestrian tunnels, bridges, and rolled curbs that provide a gradual slope from street to sidewalk. Although not specifically built as wildlife passages, such multifunctional infrastructure can be equally significant for landscape connectivity. However, it is important to recognize that communicating information on how a variety of infrastructure can serve landscape connectivity purposes may unintentionally suggest that building crossing structures specifically for wildlife is unnecessary. It should be clearly conveyed that such uses of infrastructure should not preclude purpose-built wildlife crossings, particularly if potential issues exist with multifunctional usage (such as human-conflicts in pedestrian tunnels).

4.3 A wider incorporation of data presents some practical challenges, as including all landscape connectivity features would require significant data needs and would create difficulties in managing the tool and database. WCDP could instead be used to complement or enhance other landscape connectivity projects and communication efforts. The tool could focus on purpose-built wildlife crossings, and other organizations and groups can then use these data for more comprehensive mapping of landscape connectivity in their local areas.

The Wildlife Crossing Database Platform was developed as a part of the research project:
Safe Passage: Towards an Integrated Planning Approach for Landscape

www.ecologicaldesignlab.ca/projects/research