MICHIGAN STATE UNIVERSITY | Usability/Accessibility Research and Consulting

U.S. Army Corps of Engineers
Corps Lakes Gateway Mobile Prototype

Usability Evaluation Report

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Acknowledgements

Executive Summary

This report describes the usability testing of the U.S. Army Corps of Engineers (USACE), Corps Lakes Gateway (CLG) mobile prototype conducted at two USACE projects: Green River Lake and Nolin River Lake, Kentucky in June of 2013. The goal of this study was to identify user interface issues with the CLG mobile prototype in order to improve the user experience. Usability was evaluated quantitatively and qualitatively in terms of its core components: effectiveness, efficiency, and satisfaction. Twelve recreationists at the two lakes took part in one-on-one usability sessions. The visitors interviewed identified important needed improvements, including navigation, layout/aesthetic features, new content, and reorganization of existing content.

Recommendations

Based on the results of the user interviews, the major recommendations for improving the user experience include:

- Navigation
  - Re-design navigation to be more visible and less redundant by providing navigation buttons at the bottom of the screens (i.e., Home, Find Lake, Find Activity, Favorites) and a Back button at the top of the screens.
  - Provide search options (i.e., zip code, state, distance, or keywords) for users on the Find Park page before displaying a state or regional map page with clickable points.

- Layout/Aesthetics
  - Increase the font size throughout the application (except for the Homepage where font size is adequate).
  - Increase the amount of space between links and increase the size of clickable areas for links.
  - Design and provide separate mobile applications for smartphones and tablets as these are two different platforms with different design and size expectations. The prototype was designed for a smartphone, but for ease of viewing in outside, high light conditions, user evaluation was completed using a tablet. Throughout the evaluation, some of the links and interface elements appeared awkward on a tablet screen with a large amount of empty space. While the mobile application will operate on both platforms, separate applications that are designed specifically for each will provide a more user-friendly experience in terms of layout and aesthetics.

- Content
  - Re-word and re-name titles of pages, navigation, and links to accurately reflect the content and user expectations as detailed in this report.
  - Re-design the individual lake pages to differentiate these pages from map results pages and to provide users with a variety of information about a specific lake that is easily accessible.
  - Provide more general and detailed information on main activity and specific activity pages and include links to relevant information or websites based on user expectations as detailed in this report.
  - Offer a cached or static version of the application which users can download or update before going to a Corps lake project. Some Corps projects, or areas within projects, do not have adequate Internet access. In these situations, users should have the option of downloading a static version of pertinent information for when Internet access is available.

Lastly, we recommend exploring the development of a separate mobile application or mobile website devoted to public participation where Corps stakeholders can find and comment on their recreation experiences, management issues, proposed regulations and planning documents.

We conclude that the CLG mobile app prototype is on the right path in terms of a usable, fully functional mobile application. Visitors at Corps of Engineers lakes were highly positive about the

need for such an application, stating that they would likely use it if it were available and would recommend it to their friends. We recommend that the Corps of Engineers proceed with further development and evaluation of the mobile application, and consider renaming it "Corps Lakes Recreation" to give it a more accurate and recognizable identity.

Introduction

Usability Defined

Usability refers to how easily a specific task can be accomplished with a specific tool. More verbosely, the International Organization for Standardization (ISO) defined usability as the "extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use" (ISO, 1998). Effectiveness was defined as "accuracy and completeness with which users achieve specified goals," efficiency was defined as "resources expended in relation to the accuracy and completeness with which users achieve goals," and satisfaction as "freedom from discomfort, and positive attitudes towards the use of the product." While other conceptualizations of usability have been proposed (cf. Nielsen, 1993; Rubin, 1994; Quesenbery, 2003), the ISO definition is the most widely accepted and is used by Usability/Accessibility Research and Consulting in evaluating the usability of Websites.

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<u>Usability</u>
Ease of achieving a specific goal with a specific tool

Effectiveness: How well the goal is met
Efficiency: How much energy it takes to achieve the goal
Satisfaction: How happy a user is with their experience

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Usability Benefits

Implementing usability considerations into Website design can save time and costs associated with development, maintenance, training, support, documentation, and litigation; as well as increase sales, traffic, revenue, user satisfaction, market share, productivity, and trust (Marcus, 2005). The return on investment for usability efforts is high:

- Cost-benefit ratios can exceed 1:100 (Karat, 2005)
- Traffic and sales commonly increase by over 100% (Nielsen, 1999)
- User satisfaction can increase by as much as 40% (Harrison, et al., 1994)
- Training and supervisory time can decrease by 30-35% (Dray & Karat, 1994)
- Productivity can be increased by 70% (Nielsen, 2007)
- Employee turnover can be reduced by 20% (Karat, 2005)

The earlier in the production process that usability is included implemented, the greater the benefits and savings. It is estimated that for every $1 spent fixing usability problems in the initial design of a system, $10 needs to be spent once it is in development, and $100 once it has been released (Glib, 1988).

Evaluation Scope

The goal of this research was to identify usability issues with the CLG mobile prototype. The evaluation metrics and strategies employed are detailed below. The Moderator's Guide (Attachment 1) provides a list of the steps in the entire protocol, including study overview and task instructions.

Evaluation Metrics

Usability was evaluated in terms its three constituent components: effectiveness, efficiency, and satisfaction (defined above). Effectiveness was measured as the percentage of tasks completed successfully. Efficiency was measured as the average time to perform a task and assessed based on issues observed during performance of the tasks. Satisfaction was measured by post-task questionnaires, post-study questionnaire, written feedback, and verbal comments during the session. While effectiveness and efficiency measures were quantitative, satisfaction was measured qualitatively.

Evaluation Strategy

Testing was designed to answer the following questions:

- What do users like and dislike about the flow of the CLG mobile prototype, e.g., navigation, organization of task flows, and grouping of content?
- What aspects of the user interface are hard to understand?
- What aspects of the process need to be enhanced?

Tasks designed to address these questions were developed by a Usability/Accessibility Research and Consulting team member with over 30 years of experience conducting visitor studies in park and outdoor recreation settings. The tasks pertained to three phases of a typical recreation trip: pre-trip planning, on-site activities and post-trip reflection and feedback. The mobile application tested was not "live." However, its basic functionality and several levels of screens tied to actual project data were made available to Corps recreation visitors for evaluation.

Figure 1. Data gathering station with participant, research team member, tablet with mobile app, and recording devices.

Participants consisted of a convenience sample of visitors who were recruited at two Corps of Engineers lakes in Kentucky: Green River Lake and Nolin River Lake. At both lakes, the research team met with the Corps of Engineers managers to demonstrate the mobile application and answer any questions. To maximize diversity in the sample, the Corps managers advised the research team of two campgrounds (one at each lake) where the team was likely to encounter a fairly large number of visitors who would be participating in a variety of outdoor recreation activities. The research team occupied a campground site and set up the data gathering station

consisting of a table, tablet computer with mobile app mock-up and recording software, video camera for recording tablet usage, and umbrella to darken the screen for ease of viewing in a bright, outdoor setting (Figure 1). Visitors were recruited by walking around the campground and asking for volunteers who would receive $25 compensation for the 30-minute interviews. After reviewing and signing the consent forms (Attachment 2), participants then performed up to nine tasks and filled out a survey on-site about their experience. During the interviews, participants were asked to talk out loud as they navigated through the mobile application to complete the various tasks. Both audio and video recordings of the interviews were made using Morae© (v3.2.1) software (www.techsmith.com/morae). In addition, 2-3 research team members took written notes as the participants attempted the tasks.

In the research lab in East Lansing, two independent reviewers, working with the written notes, reviewed the Morae recordings to transcribe relevant user quotes, compute task completion times, and record difficulties and successes in completing the tasks. This analysis was verified by the principal investigators and discussions with the independent reviewers took place to resolve any differences in interpretation of the data.

Participant Profile

Twelve participants, six females and six males, took part in the usability testing of the prototype at Green River and Nolin River Lakes (with 6 users participating at each site). The addresses of eleven participants ranged from 7 miles away in Campbellsville, Kentucky, to 101 miles away in Middletown, Kentucky. One participant was from Mansfield, Ohio.

The ages of the participants ranged from 19 to 72; five participants were between 18 and 30 years old, two participants were between 31 and 40 years old, and four participants were between 51 and 80. Most of the participants use the Internet every day as part of their job or education, with only two participants indicating less. The majority of the participants use the Internet for activities such as checking email, checking weather, reading news, research, playing games, planning a trip or finding a map, and shopping online.

For more detailed participant information, see Attachment 3.

Usability Results

Overview

Participants were given representative tasks for three phases of a trip to Green River or Nolin River Lake: pre-trip planning, on-site activities, and post-trip reflection and feedback (see Attachment 4 for details). Even though several participants encountered difficulties finding some of the information and completing tasks successfully, the majority of participants provided positive feedback and expressed interest in using the application in the future. They also gave a variety of suggestions for enhancements and information they would like to be added to the application.

Tasks

The 12 participants attempted up to nine task scenarios. The tasks focused on finding information using the application, such as finding directions to the park, weather, activities at the lake, and leaving feedback. Participants were also asked whether they would use the app and for what purposes to determine what additional information users would like.

The results table indicates the number of participants who completed each task successfully, the ratio of participants who gave up or were stopped to those who were incorrect, and the average time to perform each task (successful tasks only). Due to time constraints and variation in completion rates, some participants were not able to complete all nine tasks. As such, the total number of participants per task varies. See Attachment 5 for results separated by task.

Failures for tasks can be categorized as follows: Gave up, stopped, or incorrect. If a user mentioned being unsure how to proceed further on a task, this failure was deemed "gave up." When users kept trying to determine how to complete a task and had spent a significant amount of time on a page without making progress, the moderator stopped the user and moved on the next task. If a user reached a page or section and believed they had completed the task when in fact he or she had not, this was considered "incorrect."

A few participants were given minimal help for some of the tasks. For example, some participants were advised to click on the Green River or Nolin River map point when they were focused more on the list of navigation links on the Find Park page. A task was still considered completed if the user continued on after assistance and was successful in finding the correct information, and these times were included in the average time to perform a task successfully.

For some tasks, participants decided that using the built-in Search feature was needed to find the information, although the Search function was not currently working. While using this feature would be a viable option in a fully functioning application, if the participant concluded that using the Search feature was the only means for finding the information, then the task was considered a failure.

Task Results

	Number of users who completed task successfully	Ratio of those who gave up or were stopped to those who were incorrect	Average time to perform task successfully (minutes)
Task 1a	12/12	0:0	0:20
Task 1b	2/12	3:7	0:53
Task 2a	7/12	0:5	1:08
Task 2b	7/12	0:5	0:19
Task 2c	0/11	1:10	N/A
Task 2d	0/5	1:4	N/A
Task 2e	11/11	0:0	0:26
Task 3a	8/12	1:3	1:22
Task 3b	8/8	0:0	0:25

Post-Study Questionnaire Results

Participants were asked to give overall ease of use ratings for completing the tasks on the CLG mobile prototype. While one of the users gave a low rating, the results were generally positive with the majority answering Somewhat Agree (6) or higher (on a 7-point scale of Strongly Disagree – Strongly Agree). The majority of participants felt the application was easily navigated and the information was helpful. Several participants also gave suggestions for improvements, such as implementing more features and providing more detailed information with less "clicks" to reach this information.

Participants were also asked if the Corps Lakes Gateway website met their expectations. Most participants selected Somewhat Agree (6) or higher. User comments were somewhat mixed; most participants mentioned that the navigation was easy to use and that pages had the information they expected, while some users were looking for more information than was provided and felt the navigation could be easier to use.

Participants rated the application's organization, specifically the menu levels and the flow of the screens. The majority of the results were Somewhat Agree (6) or higher. Some users commented that the content was easy to find, but others mentioned that too many pages were involved in reaching the information. A couple of users also suggested adding more categories or sections to pages to make navigation easier, and adding more detail.

Participants also rated the extent to which they would recommend the application to their colleagues and friends. One user gave a neutral rating (4), but nine of twelve participants Strongly Agreed (7) that they would recommend it. Most of the participants enjoyed using the application and thought it was a great idea, and some users commented that the application would be useful for those who enjoy the outdoors and fishing. A couple users mentioned that they would recommend the application if it were further along in development and if it had some of the features that they suggested.

Participants gave feedback on how useful they found the application to be on a 5-point scale of Not At All Useful – Very Useful. While two participants answered with lower ratings, the majority of users answered Very Useful (5). Some users mentioned that not many other applications provide the same amount of information as the prototype, which would make this app very useful.

See for the detailed post-study questionnaire data.

Detailed Results

See [Attachment 7](#) for screenshots of the mobile prototype.

Task 1a. <u>Pre-trip</u>: You'd like to go biking during your visit to Green (or Nolin) River Lake, but you aren't sure if the lake has biking trails. If the lake doesn't have biking trails, then you won't pack your bike and bike equipment. So, please use the mobile app to find out if Green (or Nolin) River Lake has biking trails and whether the trails are paved or unpaved.

Success Rate	Average time to perform task successfully	Failed: Gave Up	Failed: Incorrect	Failed: Stopped
12/12 (100%)	0:20	0	0	0

<u>Task 1a Summary</u>

- All twelve participants were able to find information on biking trails successfully.
- The average time for this task was 20 seconds (range: 6-64 seconds; 8/12 users were below the average). There was a 100% success rate, which indicates that for most participants, the information was where it was expected to be.
- Brief Analysis: Participants had an overwhelmingly high success rate for this task, which suggests that biking trail information is easy to find. However, many users noted that they would like more information included on the Biking page, such as information about the distance, difficulty, time required, and terrain of trails; what wildlife might be nearby; and photos of the trails and sites they might see (e.g., waterfalls). Participants also did not realize that they could click on "Corps Lakes Gateway Mobile App" at the top of the page to return to the Homepage.

<u>Observations and User Comments</u>

- Eight participants clicked on Find Activity, then Biking, and looked at the information about trails (which is the shortest pathway).
  - "It doesn't really tell you how long it might take you, you know, like an estimate type … "
- Two participants clicked on Find Park, the Green River or Nolin River map point, Activities & Points of Interest, and then Biking to see information about the trails.
  - "It's detailed about how far the trail actually is. … They're expanding it so it gives you information to tell you that they're going to extend it to be a longer biking trail, so that will be good, and it tells about a hiking trail also, so that's good."
- One participant clicked on Find Park, Find Activity (at the bottom of the page), and then Biking.
- One participant clicked on Find Park, then wanted to use the Search feature for "Nolin River Lake Kentucky." After being prompted to try a different way, the participant clicked on Find Nearby Parks, then attempted to click on the Nolin River Lake name. He eventually clicked on the point on the map, chose Activities & Points of Interest, and then clicked Biking.
  - "This seems pretty useful if I was a cyclist. I also like how it says there's a hiking trail as well."

Expectations and Suggestions

- "Maybe information on wildlife found on trails."
- "Looks good. Has the information I would want."

- "I would like to see a map when I click on a trail link, what kind of terrain is on the trail, how long the trail is, and how much time it requires."
- "I would like to see where the trail is located, how to get there, description of the trail, age compatibility/difficulty."
- "I like to look around and see different sites. I would like to see the distance of each trail."
- "A picture of the waterfall and a layout of the trail or a map. I don't know if there are other trails or other difficulty levels I guess, or you could have, like, a [difficulty] bar … so people have a visual of what they're looking for instead of having to go through and read everything."
- "I would like to know the types of trails, the distance of each trail, and if there is any wildlife in the area of each trail."
- "I liked the information provided. Seemed like enough."

Task 1b. <u>Pre-trip</u>: Pretend you haven't left home yet, but you have decided that you'd like to spend the weekend at Green (or Nolin) River Lake. Find directions to Green (or Nolin) River Lake.

Success Rate	Average time to perform task successfully	Failed: Gave Up	Failed: Incorrect	Failed: Stopped
2/12 (17%)	0:53	1	7	2

Task 1b Summary

- Two of twelve participants were able to find directions to Green (or Nolin) River Lake successfully.
- Seven participants thought they had reached the location where they would find information on directions, but they were incorrect. The incorrect pages included the Green (or Nolin) River, Activities & Points of Interest, and the List of Lake Areas pages.
  - o Four of these participants only wanted to Search for directions or decided that a Search was needed for the user to find the information, although the Search feature was not currently working. While Search would be a viable option, because the participant did not continue to try to find the directions in another way or elsewhere, stopping at Search is considered a failure.
- Two participants were stopped by the moderator after one user was unsure what to do on the Find Nearby Parks page, and one user tried different links on the Green River page.
- One participant gave up after going to the Green River page and back to the Find Park page.
- The average time for this task was 53 seconds with a 17% success rate, which indicates that for nearly all of the participants, the information was not where they expected.
- Brief Analysis: The very low success rate and the number of users who wanted to only use the Search feature for this task indicates that the location and wording for the directions link need to be improved. Most users did not expect to have to go to the information page for a specific park (Lake Info & Alerts) to find directions; instead, many users expected directions to be available earlier, such as when they were on the lake's map page or as an option when they clicked on the lake on the map (i.e., similar to a Directions link on Google Maps). Some users also encountered difficulties when trying to click on links in the navigation bars on the Find Park and Green (or Nolin) River lake pages, which indicates that (a) more space should be added between links, (b) the spacing between the link names and their corresponding buttons needs to be reduced and (c) links should have a larger clickable area.

Observations and User Comments

- Two participants clicked on Find Park, the map point, Lake Info and Alerts, and then Take Me There (which is the correct pathway). One of these participants wanted to Search first on the Find Park page, and then he clicked on the map point. He assumed directions would be in the list of links above the map, but he proceeded to click on Lake Info and Alerts when he was asked which link he would go to in the list given.
- Three participants immediately clicked on Find Park, then only wanted to Search for directions.
  - o "Would type in 'Green River' [for the search]. I would type in my address to see how long it would take, see roads and directions, etc."
  - o "I would try searching for 'Nolin Lake' or 'Wax.'"
  - o "I would search for 'Nolin Lake camping areas.'"

- One participant clicked on Find Park, tried Find Park again at the bottom of this page, and then clicked Find Activity. She went back to the Homepage and then clicked Closest Parks, but she was unsure what to do next. She was told to click Find Park and then the Green River map point, and then asked what she would do next; she clicked on Activities & Points of Interest, which is incorrect.
    - "It's showing me a map, but I would like it to show me from my house to here. ... Yeah, I'd be a little stumped right here."
- One participant clicked on Find Park, and then the Nearby Parks link (which he had difficulty clicking on). He tried clicking the map point, but he was unsure what to do next to get directions from where he was currently.
- One participant clicked on Find Park, then wanted to Search for "Green River Lake." He was told to click on the map point, and then asked what he would do next. He clicked on Activities & Points of Interest, went back to the Homepage, clicked Find Park and then the map point again, and tried List of Lake Areas, which is also incorrect.
    - "I mostly would just try to find directions on the map."
- One participant clicked on Find Park and then the Nolin River map point. She stopped on the Nolin River page, even after the task was read again. She thought that clicking on the map point would bring up directions or allow the user to type in their address in order to get directions.
- One participant clicked on Find Park, then wanted to Search for "Nolin River Lake." When asked what else she might do, she clicked on the map point and expected to be able to zoom in here.
- One participant clicked on Closest Parks, then the Nolin River map point. She clicked on Find Park in the bottom navigation, and then only wanted to Search for "directions to Nolin River."
- One participant clicked on Find Park and then the Green River map point. The user went back to the Find Park page, but he could not find the information he was looking for and gave up at this point. He also mentioned that he would probably use MapQuest instead of the feature inside the mobile app.
    - "I don't see where it would say 'directions' ... unless it would be under Find Park ... Okay, so I'd be in a tizzy now, looking for a Search or something."

Expectations and Suggestions
- "I would want mileage, distance to the campground, directions through Google Maps or another program, how many sites are available, and types of facilities."
- On the Green River page when looking for directions, "I would think about looking for a link in the list at the top of the page for finding directions to a park. I didn't know the map was clickable."
- "[When I click on the map point], I would want where I was and a bunch of different parks there, and be able to figure out which one I want to go to ... [be able to put in where I am or have it know where I am, and then give me directions to the lake]."
- "I would think if you clicked A [the map point], it would direct you to a website where you could find information about that particular campground. If I click on [the map point], directions should pop up, turn-by-turn. For an app on your phone, I would think it would ask you for current location or give you an option to put in an address."
- "Have the map be interactive where you can zoom in and/or find directions on the map point page."
- "I would like to see turn-by-turn directions to the lake, putting in your address and Nolin River Lake—similar to Google Maps."
- "I would like to see information [and search results] that would be important for planning the trip, such as amenities for each site [or campground], if pets are allowed, how long the

sites are, if tents are allowed, how many vehicles are allowed, if the sites have shady areas, is there a place to cook, [and if it's] bring your own grill or not."

- For search results, "I would expect to see a list of state parks, camping areas, names and addresses, phone numbers, maps, what is and isn't available."
- When searching, "I would expect to see a map, things to do, marinas, bait shops, the lake itself or nearby campgrounds."

Task 2a. <u>At lake</u>: You are thinking about going fishing tomorrow. Find tomorrow's weather report.

Success Rate	Average time to perform task successfully	Failed: Gave Up	Failed: Incorrect	Failed: Stopped
7/12* (58%)	1:08	0	5	0

*Two participants needed minimal help to complete the task.

Task 2a Summary

- Seven of twelve participants were able to find the Weather page successfully. Two of these participants were given minimal help by being asked to try to click on the map point on the Find Parks page.
- Five participants thought they had reached the location where they would find information on weather, but they were incorrect. The incorrect pages included the Fishing Facilities and Boat Ramps pages.
    - o One of these participants only wanted to Search for weather information, although the Search feature was not currently working. While Search would be a viable option, because the participant did not continue to try to find weather information elsewhere, stopping at this option is considered a failure.
- The average time for this task was 68 seconds with a 58% success rate, which indicates that some participants had difficulty finding the weather report.
    - o The fastest time with the correct solution was 14 seconds; the slowest time with the correct solution was 96 seconds.
    - o Half the participants were well below the average, while half were well above.
- Brief Analysis: The success rate and the average time to perform this task successfully indicate that although a slight majority of users were able to find weather information, they did not always do so quickly and it was not initially where they would expect; therefore this location needs to be changed. Many users expected weather information to be either earlier in the navigation (i.e., it took too many clicks to reach this information), or they expected weather information to be given for specific activities, such as on the Fishing Facilities page. Some users also expressed that more days should be given for the weather forecast. Several users also encountered difficulties when trying to click on links in the navigation bars, which indicates that (a) more space should be added between links, (b) the spacing between the link names and their corresponding buttons needs to be reduced and (c) links should have a larger clickable area.

Observations and User Comments

- Two participants clicked on Find Park, the Green (or Nolin) River map point next, and then clicked Weather. One of these participants zoomed in before clicking on the map point.
    - o "I use AccuWeather all the time. I probably wouldn't [use this app] because I'm more used to [what I use]. It's quicker and I don't have to learn anything over again."
    - o "[This weather information] sounds about right to me. I use the standard iPhone weather app; it's not always very accurate."
- Two participants clicked on Find Activity, went back to the Homepage, clicked on Find Park, the Green (or Nolin) River map point next, and then clicked Weather. One of these participants thought at first that an option would be given on each specific activity page to look up weather information.
    - o "I wouldn't necessarily use your app for the weather honestly, unless I knew the app well enough to know that I knew that it was right there."

- One participant clicked on Closest Parks, the Nolin River map point next, and then Weather.
- Two participants found the Weather page after being told to try clicking on the point on the map. One of these participants clicked Find Park first, then wanted to Search for "Green River weather" before being told to click the map point. The other participant clicked on Closest Parks first, went back to the Homepage, clicked on Find Park, and then was told to click the map point.
    - "I would probably type in whatever county or city I'm in to see what the weather would be. I'd do it on my phone—down by the water they have Wi-Fi—and it would bring up the weather for like a week. … Actually if I had this app on my phone, I would probably use it [for weather]."
- Three participants clicked on Find Activity and then Fishing Facilities, which is incorrect. Two of these participants thought weather information would be available for specific activities. One participant thought weather information would be available at a higher level ("earlier") in the navigation of the app, and mentioned that she uses a weather channel app for weather on her iPod.
- One participant clicked on Find Activity and then Boat Ramps, which is incorrect.
    - "I like that little setup there [on the Find Activity page]. You don't get that much—the icons."
- One participant clicked on Find Activity, went back to the Homepage, clicked on Find Activity again, then Camping, but she was unsure if weather would be located here or elsewhere. She went back to the Homepage again, clicked on Find Park, then wanted to try to Search for the name of the county or park along and "weather," such as "Nolin Lake weather."

Expectations and Suggestions
- "If you're going to stay for 4-5 days or a week you would definitely want to know the extended forecast."
- "I use my iPhone weather app. I think a 5-day forecast would be useful here."
- "Mine [Find Park page] would have a weather [link] on it."
- On the Fishing Facilities page, "I would expect to see the docks close to Green River and just some generalized weather and forecast for today and the next day."
- When on the Find Activity page, "I would have rather clicked on something that says 'Weather' [earlier]. Yeah, because in the Find [Homepage] you only have Find Park, Find Activity, and Closest Parks. You don't have weather … "
- Four participants expected weather information to be provided on each of the activity pages, specific to that activity.

Task 2b. <u>At lake</u>: The usual place where you launch your boat is closed for construction. Find out where the other boat launches at Green (or Nolin) River Lake are located and if they are open.

Success Rate	Average time to perform task successfully	Failed: Gave Up	Failed: Incorrect	Failed: Stopped
7/12 (58%)	0:19	0	5	0

Task 2b Summary

- Seven of twelve participants were able to find information on boat launches successfully.
- Five participants thought they had reached the location where they would find information on boat launches, but they were incorrect. The incorrect pages included the Lake Info & Alerts, List of Lake Areas, and Area Info & Alerts pages.
- The average time for this task was 19 seconds with a 58% success rate, which indicates that some participants were able to find the information quickly, whereas some participants had difficulty locating the information where they expected it.
    - The fastest time with the correct solution was 5 seconds; the slowest time with the correct solution was 70 seconds.
    - Only one person was well above the average; the rest were below.
- Brief Analysis: Over half of the participants were able to find the correct information somewhat quickly; however, nearly half of the participants were unable to find boat launch or ramp information, and instead expected this information to be on pages for specific lakes or lake areas. Therefore, alert information for boat ramps (e.g., which ramps are closed because of construction, flooding, etc.) can remain in its current location, but it should also be included and updated on an alert page to ensure that users are aware of any closures. Some users also suggested information that they would like included on the Boat Ramps page, such as photos, traffic flow, depth of boat ramps, what's nearby (e.g., marina, restaurant, bait shop, rental options, nearby points of interest), map or directions, water levels, and hours.

Observations and User Comments

- Six participants clicked on Find Activity, then Boat Ramps (which is the shortest correct pathway).
- One participant clicked on Closest Parks, the Nolin River map point, Lake Info & Alerts, back to Activities & Points of Interest, and then Boat Ramps (which is the correct page).
- Two participants thought the information about boat launches would be found on the Lake Info & Alerts page, which is incorrect. One of these participants clicked on Find Park first, the Green River map point next, then Lake Info & Alerts. The other participant clicked on Find Park first, Find Nearby Parks next, the Nolin River map point, then Lake Info & Alerts.
    - "I was looking for a list of launching ramps and how far to the closest one."
- Two participants though the information about boat launches would be on the Area Info & Alerts page (for a specific area), which is incorrect. These participants clicked on either Find Park or Closest Parks first, the Green River map point next, List of Lake Areas, Holmes Bend, and then Area Info & Alerts. When one of these participants reached the List of Lake Areas page, she assumed at first that all the items listed were the marinas with boat ramps.

- One participant clicked on Find Park, the Green River map point next, and then List of Lake Areas. He mentioned that he would click on a lake area where he already knew there was a boat ramp.
  - "I would just click on one of the areas. All of them have ramps that I know of."

Expectations and Suggestions
- "If I click on one [of the Boat Ramp links], it should tell me where the ramp would be, have a picture of the location or ramp, prices, and how often it is used [or traffic flow]."
- "Links [on the Boat Ramps page] should give address or locations on the lake, and directions to the ramps. The depth of boat ramps would be useful."
- "I would expect to find which boat ramps had docks."
- "[I would expect] pretty much what you have on here. I would want a map with directions to the ramp; if there was a marina, restaurant, or other points of interest at the boat ramp; how far to the ramp from your location; and when/if it opens or closes."
- "I would like to see the steepness of the ramp and clearance for different sizes of boats, how heavy traffic is usually in the area, and water level."
- "I'd like to see where each ramp is located, if there are hours when you can launch, water level, and whether it is open or closed because of rain or other [things]. The mileage from someplace maybe, so you'd know which one is closest to you, because some of these parks are a little bit farther apart."
- "I would like to see lake levels, flooding … because we came all the way out from Bowling Green, and went to the Wax marina, and it was flooded. We couldn't get to our boat. … If we had some kind of weather alerts letting us know ahead of time … by email through the app. And night fishing information, if it's going to be foggy."
- "The first place where it said 'Boat Ramps,' you'd want to know if the ramp is currently open. [I would expect to see] if there is a marina at the ramp, and a bait shop. It wouldn't matter how many can launch or traffic in the area, but good to include regardless. Whether it's open or closed, and lake level for when it's rained for a few days."
- "The [Boat Ramps] page looks pretty good and has enough information. I would like to see it under [Lake Info & Alerts] if any ramps are closed down, and alerts would be good, then that way it could tell you if there's more than just a boat ramp that's out. There might be something else to tell you [such as] if the water is up … if it's closed for construction, etc. [Also, I'd like to see] if they have speedboats vs. pontoons, and jet-skis. Closest place to stop and get gas, like is there a marina close … so you don't get stranded."
- "I expected to find information on closed ramps or ramps under construction on each specific lake area's [Area Info & Alerts] page."
- "I would want to see an alert for the closed boat ramp, and I also would have checked nearby parks and attractions."

Task 2c. <u>At lake</u>: The kids/grandkids are getting bored. Find out if there are any special events or things for the kids/grandkids to do at Green (or Nolin) River Lake.

Success Rate	Average time to perform task successfully	Failed: Gave Up	Failed: Incorrect	Failed: Stopped
0/11 (0%)	N/A	0	10	1

Task 2c Summary

- All eleven participants who attempted this task were unable to find the Events page, and all of the participants expected that events information would be on the Find Activity page (or Activities & Points of Interest page) or on specific activity pages.
- This task had a 0% success rate, which indicates that for all participants, the information was not where they expected it to be.
- Brief Analysis: All eleven participants failed this task, indicating that the Events page was buried and not where users expected it, and therefore this page or information needs to be re-located. Participants expected Events information to be included on the activity pages as a separate section (i.e., one of the icons). One participant also suggested including a calendar option to allow users to look ahead to facilitate trip-planning, and another participant suggested using a banner at the top of the page to advertise daily events.

Observations and User Comments

- Six participants clicked on Find Activity and thought Events information or a link to Events would be on this page. One of these participants inspected the Find Activity, Find Park, and Closest Parks pages before deciding that Find Activity would be the best choice for this information.
- Three participants clicked on Find Activity then went to specific activities, including Swim Area and Biking. One of these participants clicked on Find Activity, Swim Area, and Holmes Bend; he then went back to Find Activity again and clicked on Biking.
- Two participants thought Events information would be on the Activities & Points of Interest page after searching on other pages first. One of these participants clicked on Find Activity first, went back to the Homepage, clicked on Find Park, went back to the Homepage, clicked on Find Park again, the Green River map point, and finally Activities & Points of Interest. The other participant clicked on Find Activity, went back to the Homepage, clicked on Closest Parks, the Nolin River map point, and then Activities & Points of Interest.
  - "I was looking for something up there [in the navigation list on the Green River page]."

Expectations and Suggestions

- "I expected a special events link on the Find Activity page, and specifically for certain dates."
- "Maybe a separate link for special events or activities [here on the Find Activity page]."
- "You could have a category [on the Find Activity page] for special events and kids. For example, an amphitheater for movie nights. The categories don't fully cover all activities."
- "I'd like a special events category [on the Find Activity page] for current and future events for the camp. For example, a bluegrass festival on August 17th."
- "I'd want an [icon link] for surrounding activities. For example, for fireworks—where they are happening for the state park. It would be nice to have something like [specific signs] with the directions, because you see the signs, but on the signs, … they don't tell you the

directions. [You can drive a long way without finding stuff.] Right, [some friends] ended up at Moutardier and we were like, 'You have to go all the way around that way … '"

- "I'd want a list of special events, for holidays like the fourth of July and fireworks. They would all just be under Find Activity."

- "I [expected that] kid activities were or would be included in what was listed [on the Find Activity page]. That has everything there. You can go fishing, you could take a picnic, you can go biking, swimming, walk on the trails, so that's pretty good. Could have some details for each activity such as open or closed for locations, and having a link for special events would be good."

- "I'd like to find special events, such as the movies they show, under the Find Activity page, maybe under its own category. [For the Swim Area page], I would expect to find out where the beach is, if it's near the campsite, walking or driving distance, etc."

- "That's pretty much what I would expect to see [on the Activities & Points of Interest page]. Maybe have daily events on a banner up top—like a headline."

- Two participants were shown the Events page and asked if it was what they expected.
  - "I would want more details about specific events. Seems generalized."
  - "If I were doing it, I would think that if you had an actual calendar of the days, and if there was an event, you could actually click on that link and it would tell you everything you could do in that area for that day. That way, you would look ahead and plan your trip according to the events. The calendar could be [an icon] on the Find Activity page too."

Task 2d. <u>At lake</u>: You'd like to find out what else there is to do or other attractions within the vicinity (30 miles, say) of Green (or Nolin) River Lake. Use the mobile app to find out what else there is to do in the area.

Success Rate	Average time to perform task successfully	Failed: Gave Up	Failed: Incorrect	Failed: Stopped
0/5 (0%)	N/A	0	4	1

Task 2d Summary

- All five participants who attempted this task were unable to find the Nearby Parks and Attractions page. The users expected that the information would be on the Find Activity or Activities & Points of Interest pages (or within each activity), or on the individual lake area pages.
- This task had a 0% success rate, which indicates that for all participants, the information was not where they expected it to be.
- Brief Analysis: All of the participants who attempted this task failed at finding the correct information, indicating that the Nearby Parks and Attractions page was buried and not where users expected it; therefore, this page or information needs to be re-located. Most of the participants expected information about what else there is to do or other nearby attractions to be included on the activity pages as a separate section or category.

Observations and User Comments

- One participant clicked on Closest Parks, the Green River map point, and then Activities & Points of Interest. She went back to the Homepage, clicked on Find Activity, and then said she would use the zip code tool at the bottom of the page.
  - "I don't know the zip code down here, but I could find out if I want to. I would Google the zip code and use it to find local activities."
- One participant clicked on Closest Parks, the Green River map point next, and said he might Search for activities in the nearby area. He then decided to go to List of Lake Areas.
  - "I would probably go on each one of [the lake areas] to look and see what they have going on at their lakes and stuff."
- One participant clicked on Closest Parks, then thought other attractions would show up on the map and be clickable. He did click on the Green River map point, and was directed to click on the Activities & Points of Interest link. He thought this page should list other things to do and nearby attractions.
- One participant clicked on Find Park, the Green River map point, and then Activities & Points of Interest. He expected the information to be on this page.
- One participant clicked on Closest Parks, then tried to click on other things on the map (besides the map point). He went back to the Homepage, clicked on Find Activity, then on Picnic. He thought he would find activities near the area in each individual activity link.

Expectations and Suggestions

- Three participants reached the Activities & Points of Interest page for Green (or Nolin) River, expecting that information about what else there is to do or other attractions would be on this page. One of these participants mentioned that he would like to see what else there is to do in the area on this page, and have it based on the lake you choose on the map (from the Closest Parks page).
  - "I would expect restaurants or recreational activities like miniature golf. Maybe a [section on this page] for kids."

Task 2e. <u>At lake</u>: You decide you would like to see a different part of the lake and have a picnic lunch. Use the mobile app to find a picnic area on a different part of the lake from where you are now.

Success Rate	Average time to perform task successfully	Failed: Gave Up	Failed: Incorrect	Failed: Stopped
11/11 (100%)	0:26	0	0	0

Task 2e Summary

- The eleven participants for this task were all able to find information on picnic areas successfully. Four participants took a different, longer path than intended, but they found the information regardless.
- The average time for this task was 26 seconds (range: 8-66 seconds; 8/11 users were below the average). There was a 100% success rate, which indicates that the information was exactly where it was expected to be.
- Brief Analysis: Because of the overwhelmingly high success participants had, there is very little to change regarding this task. A description of additional services, amenities, and fees should be provided so participants would know what to expect from the park while they are there.

Observations and User Comments

- Seven participants clicked on Find Activity, and then Picnic to view information on picnic areas.
- Two participants clicked on Find Park, the Green River or Nolin River map point, List of Lake Areas, Holmes Bend, Activities & Points of Interest, and then Picnic to view information on picnic areas.
- One participant clicked on Closest Parks, the Green River map point, List of Lake Areas, Holmes Bend, Activities & Points of Interest, and then Picnic to view information on picnic areas.
  - "I would probably choose one of those and see what all they have."
- One participant clicked on Closest Parks, the Nolin River map point, Activities & Points of Interest, and then Picnic to view information on picnic areas.
  - "That's an awful long way to go to find Picnic."

Expectations and Suggestions

- "I'd want to know where it's located, if there's shade, any nearby playgrounds for kids, if pets are allowed, if the area is flat, and maybe include a picture."
- "What kinds of shelters are there, nearby restrooms, and how many people it can accommodate."
- "I want to see if there's drinking water available, restrooms, if tables are available, and if there's trash containers."
- "You should have a picture of the area to click on, have general information like rental fees, and stuff about facilities like restrooms."
- "If it's reservable for $50. I would assume if you're going to use it, you have to reserve it … If I wanted to guarantee for our family reunion, we'd do it at Rough River here honestly. We'd reserve, that way we'd know it's ours."
- "Maybe a link to weather in the area of the picnic site, and a phone number to reserve in advance."

- "Probably a stretch but I'd like to know if the area is sprayed for bugs. Maybe also if the area has phone or internet reception, and a link for weather in the area."
- "The simplest is better, especially for older people that don't know the computer that well. Sometimes it gets frustrating when they have to 'click, click, click' to get to someplace."

Task 3a. <u>Post-trip</u>: You want to let the management staff at Green (or Nolin) River Lake know what a great time you had during your recent stay. How would you use the mobile app to provide this feedback to lake management?

Success Rate	Average time to perform task successfully	Failed: Gave Up	Failed: Incorrect	Failed: Stopped
8/12* (67%)	1:22	1	3	0

Three participants needed minimal help to complete the task.

Task 3a Summary

- Eight of the twelve participants were able to find information on providing feedback successfully. Three of the eight participants required minimal help to proceed to the information by being told to try clicking on the map point.

- Three participants reached or stopped on a page in the application where they expected to find the information, or they expected to click a link that led to an external website, but they were incorrect overall. The incorrect pages include Holmes Bend on the List of Lake Areas, the Take Me There link on Lake Info & Alerts, and Wax on the Camping page under Find Activity.

- One participant gave up on the task when they could not find information on the Green River map point page.

- The average time for this task was 82 seconds with a 67% success rate, which indicates that for most participants, the information was moderately difficult to access.
   - The fastest time with the correct solution was 30 seconds; the slowest time with the correct solution was 141 seconds. All but one user were below the average.

- Brief Analysis: Some participants expected to find feedback on a page that was higher up in navigation. The Tell Us What You Think page should be included in the list of links on the Green River or Nolin River Lake pages. Additionally, feedback should be made specific to each area around the lake due to areas being different and users wanting to make comments pertaining to the area in which they were staying. The comment box was also popular among participants, but some users wanted both a ratings system and the comment box. The font size was mentioned as being too small, especially for older participants, and so it should be increased for some links on the Lake Info & Alerts page. The wording of the Tell Us What You Think link should be changed to convey this information better, such as "Contact Us," and the Take Me There link should be similarly changed to "Directions" so as not mislead users.

Observations and User Comments

- Four participants clicked on Find Park, the Green River or Nolin River map point, Lake Info & Alerts, and then Tell Us What You Think to view information on leaving feedback.

- Three participants clicked on Find Park, but they were assisted with clicking on the Green River or Nolin River map point. They clicked on Lake Info & Alerts afterward, and then Tell Us What You Think to view information on leaving feedback.

- Two participants expected to navigate to an external website for Green River or Nolin River Lake after clicking on specific links, such as the Take Me There link on the Lake Info & Alerts page, and the Wax link on the Camping page under Find Activity.
   - "I wouldn't be able to find it here right now, but if I was on this website and I found it, I would love to put feedback on there … "

- Two participants expected to find information by clicking on the Take Me There link or the phone number on the Lake Info & Alerts page.
  - "I would think that would direct me straight to their website."
- Two participants clicked on Find Park, then wanted to use the Search feature at first, using terms such as "management" or "comment."
- Two participants expected there to be a link or more information on leaving feedback after clicking on Find Park and then the Green River or Nolin River map point.
- One participant clicked on Find Park, the Green River map point, List of Lake Areas, and then the Holmes Bend link.
  - "I expected a link to leave feedback on the Lake Area's page since I'm staying in the area, and Holmes Bend might be different than other areas."
- One participant clicked on Find Park, tried the Search function, was given minimal assistance to click on the Green River map point, and then clicked Lake Info & Alerts. They then tried clicking the non-functional phone number link associated with the Take Me There link, but then decided to click on Tell Us What You Think to view information on leaving feedback.
- One participant clicked on Find Activity first, but then went back and clicked on Find Park, the Nolin River map point, and paused momentarily. They expected to find information on this page, but then clicked on Lake Info & Alerts, and then clicked on Tell Us What You Think to view information on leaving feedback.
  - "Yeah, some kind of link, like how it has the information here."
- One participant clicked on Find Park, the Green River map point, and gave up on the page when they expected a "Contact Us" type of link. They were later shown the correct page for feedback purposes.
  - "I don't see anything that I think would take me there."
- One participant clicked on Find Park and paused on the Nolin River map point. They were looking for a Contact link on this page, but were given minor assistance to click on Lake Info & Alerts. They immediately clicked on Take Me There, as it was at the top of the page and seemed related to what they were looking for. They were later shown the correct page for feedback purposes.
  - "I would think that it would direct me straight to their website. … Honestly, with this right here, if it's not up at the top of the page, I'm not going to scroll if I see something that makes me think it's going to direct me to what I'm looking for."
- One participant clicked on Find Park, but seemed lost on the page. They were shown the Nolin River map point and seemed confused with the links on the page. They were given minor assistance to click on Lake Info & Alerts and to scroll down and click on Tell Us What You Think.
  - "I don't know. It would be nice to be able to have, like, somewhere where you can make comments."
- One participant clicked on Find Park, Find Nearby Parks, Find Activity at the bottom of the page, Camping, and then Wax. They expected this link to lead to an external website for the Wax campground, where they would leave their feedback.

Expectations and Suggestions
- "I expected a link to leave feedback on the page where I'm staying, since it might be different than other areas."
- "Sometimes they don't put the right stuff on there. … I'd be telling them they need a basketball court."
- "The font size is kind of small."

- "Like, me, I might not think of everything like that. If you had a question there, then yeah, I would like to see that."
- "I read product reviews and make decisions based on those, so the comment box is helpful."
- "I think more of a survey type of system is better with ratings."
- "I think the box would be helpful too because there are sometimes things that are a lot more specific than just saying that the bathrooms were rated, like a 5 out of 10."
- "I would think that when you clicked on the map, it might have, like, a contact link, or you know, contact information with a phone number and an address that you could drop a card in the mail or call or email them."
- "I wouldn't because you're going to tell them what you think. You have something in mind, then a survey's not going to help. You're either going to complain or praise. Most of the time it's to complain, because I'm in customer service and I know. You don't get the good calls, you get the bad calls. I wouldn't use a survey. I would write them out in a paragraph and tell them what I thought."
- "I like the open comment system so you can tell management exactly what you want."
- "When I go shopping online, and my son wants a telephone, and … I'll read the reviews and I'm like, 'Well, no, this one's not a good phone.' Something like that, like if somebody wants to come camping here, and people put in the review, then they'll know what to expect when they get here. … Just like they do with motel rooms, you know, they star the motel rooms? I think that would be a good idea."
- "Your lettering is really small … on the page before you got here … like for us old people, we need bigger print."

Task 3b. <u>Post-trip</u>: Now that you've been there and had a great time, you want to know more about the history of Green (or Nolin) River Lake. How would you find information about the history of this lake?

Success Rate	Average time to perform task successfully	Failed: Gave Up	Failed: Incorrect	Failed: Stopped
8/8* (100%)	0:25	0	0	0

One participant needed minimal help to complete the task.

Task 3b Summary

- The eight participants for this task were all able to find information on the history of Green River or Nolin River Lake successfully. One participant required minimal help to proceed to the information.
- The average time for this task was 25 seconds with a 100% success rate, which indicates that the information was generally where it was expected to be, but some participants did not immediately find the information where they expected it.
  - The fastest time with the correct solution was 16 seconds; the slowest time with the correct solution was 34 seconds. Five participants were below the average; three were above.
- Brief Analysis: Because of the high success participants had, there is very little to change regarding this task. The History link should be made easier to find by bringing it higher up on the page.

Observations and User Comments

- Five participants clicked on Find Park, the Green River or Nolin River map point, Lake Info & Alerts, and then History to view information on Green River or Nolin River Lake.
- One participant clicked on Find Park, but was confused on how to proceed. They were shown the Nolin River point on the map, and they clicked on Lake Info & Alerts and then History to view information on Nolin River Lake.
- One participant clicked on Find Park, the Nolin River map point, Lake Info & Alerts, and then paused to consider clicking on the Take Me There link. However, they found and clicked on the History link to view information on Nolin River Lake.
- One participant clicked on Find Park, the Green River or Nolin River map point, and then Activities & Points of Interest. They were uncertain about finding the information here, so they navigated back to the Homepage, then clicked Closest Parks, Nolin River on the map, Lake Info & Alerts, and then History to view information on Nolin River Lake.

Expectations and Suggestions

- "I think it's pretty useful for someone who would want to know that information."
- "It gives you an overview, and if you really wanted to do in-depth, you would do more than the app would do anyway, so I think that's adequate for what you're looking for."
- "I like how it's in bullets so you don't have to search for any particular information."
- "You can only fit so much on a page, you know? It's always interesting to know the information that's on here."
- "I like reading history, and this page is helpful."
- "The information here is just about right."

Task 4. Now that you've explored the prototype a bit, we're wondering whether you would use an app like this? What would you want to use this app for, and what information would be helpful that you would want to find?

User Comments on: Would you use an app like this?

- Eleven of the twelve participants said they would use this app if it was available.
  - "Yes, because you don't have to search Google for it, it's all right here for you."
- One participant said he would most likely not use this app.
  - "I would probably never use it. If this place would have internet connection, I would definitely not use it. I would search on my computer, rather than a smartphone."

User Comments on: What would you want to use this app for?

For Activities, Things to Do Nearby, and General Information

- "The activities are important. I would like to know if they're having a community cookout or something, and I would like to see that with dates so we know if we're down here those days that that's something we can do."
- "To know what activities they have going on, what they have around for the kids to play with."
- "Probably for fishing and different parks—what they have to do, what was going on."
- "Probably finding activities, especially for the kids. Just stuff to do, not just here at the campground."
- "I think it would be really helpful for someone who wants to go camping. I really liked the activities and points of interest, because whenever I come to the lake I'm always trying to get into new things like hiking, and the fact that there's a link for trails, I thought was really cool. It's a lot easier than having to go somewhere and get a directory, if it's right there in your hands."
- "I think it's a pretty great app. [I'd want to use it for] finding where to go, maps on how to get there from your location, if they have restroom facilities and what [other] facilities they have included, and if it's a dry county or not. And I get lost what time zone I'm in here, and if you can have fireworks and stuff."
- "I would probably go to activities because I know there's more that goes on than I know about."
- "I would like to know what activities are going on, especially if it's a holiday weekend to know what you need to bring with you. If [there are] biking trails and playgrounds, and for those people who have a tent—do they have bath houses. And mainly if there are any events close if the kids get bored."
- "Try to put basic information that you can get without internet access, because you can't get internet out here if you need something. Like a pamphlet for activities at the campground or what's nearby, and give it out when people buy their spots or something."

For Rentals and Reservations for Campgrounds

- "It would be convenient to note a place where you could link to their site if they have one, or somewhere where you could find out prices for [pontoon rentals]."
- "To know what kind of campgrounds they have. Like if we wanted to have a big family gathering or a group thing, the prices for it and stuff like that, for more parking, etc."
- "For activities, reserving your camp spot, and availability would be a big thing—to make sure it was updated regularly, because if it wasn't it would be useless. A lot of times— there's 6 families of us—we get 4 spots because that's all you're allowed to reserve at once for one person. … We always have to come and scope it out and make sure we've got enough room together. So the other night I had to write it all down and go home and reserve, and it would've been grand to just punch it in [when] we're standing right here on it. [Some of them are walk-ups] and not reservable, so we had to come down at night and get it before anyone else would so we [wouldn't have a stranger between us]."

- "The thing we struggled with that would be nice is finding contact information—how to get a hold of them and make reservations. When their peak seasons are, and how long it will take to make a reservation—today he told us it would take 3-4 weeks to get a reservation over by the lake front."
- "I would probably go to reservations and find out about camping."
- "I would like to see the availability of campsites."

For Fishing and Boating

- "Water temperatures, water levels. The Corps puts brush piles in that attracts the fish … if it showed where the brush piles that the Corps puts in the lake are to fish out of. Would be helpful for people not familiar with the lake [by providing the GPS coordinates]."
- "On this lake, I would like to know where those brush piles are … with GPS coordinates."
- "Lake temperature, lake levels, and if it's rising or lowering. Brush piles … if there's debris on the lake."
- "Is there [easy access] to the lake, if they allow you to fish in that area or not."
- "[For fishing and boating,] what's proper and not—boating etiquette, the rules of the lake. Maybe an emergency place if you get lost, and it would be nice to know what kind of fishing limits there are, the most common ones. And there is a free fishing weekend."
- "I'd like to see when it's good fishing. People could put a review on there of what they caught and how big it was."

For Weather

- "I would want to check the weather—real-time weather, or as close as you can get."
- "For fishing, and what the weather's going to be doing for a week or so."

CLG Mobile Prototype Recommendations

Based on the interview results, we make the following recommendations in three categories (navigation, layout/aesthetics, and content) for improving the CLG mobile prototype. Implementation of these recommendations should result in a fully functional, or nearly fully functional, mobile app for Corps of Engineers water-based recreation.

Navigation

- Move the location of most navigation to the bottom of the page to allow more visibility for these options and for the content of the page. Icons should be provided (with text explanations underneath as well) for links to the following: Home, Find Lake, Find Activity, and Favorites. A Back button should be provided at the top of the page when applicable. Re-designing the navigation in this way would help place the focus on the content of a page, but give users easy access to needed links and functions.
- Re-design the Find Park page to incorporate searching features that provide users with the option to search for lakes using one of the following: zip code, state, distance (i.e. Closest Parks within the ranges of 50, 100, or 200 miles), or keyword(s). Upon using this search tool, a map with clickable points would be provided on the next page that displays the search results.
- Adjust the Hotspot link on the map to be centered on the map point for the lake.

Layout/Aesthetics

- Increase the font size throughout the application (except for the Homepage where font size is adequate).
- Provide distinguishing features to make it clear the user has reached a new page. For example, the Find Park and individual park pages are very similar with the white box of navigation and a map, which may make it unclear to some users that these pages are different. Therefore, the layout of the individual park pages should be clearly distinguishable the Find Park page (and map search results).
- Increase the amount of space between links and increase the size of clickable areas to ensure that users are able to easily click on the link they wish. For the current navigation links on a page, the spacing between the link names and their corresponding buttons needs to be reduced, as currently the buttons are not next to the link text.
- Design and provide two separate applications for smartphones and tablets, with overall layout and aesthetics differing appropriately. Although similar in some ways, these platforms differ in design philosophy and user expectations.

Content

- Re-name the application "Corps Lakes Recreation" to give the app a more accurate and recognizable identity for users.
- Re-word titles of pages and links to accurately reflect the content and what users are expecting. For example, change the following: "Find Park" to "Find Lake"; "Closest Parks" to "Closest Lakes"; "Activities & Points of Interest" to "Activities" (and only include activities on this page); and "park" or "parks" to "lake" or "lakes" throughout the application.
- Provide an explanation of what users can use the application for and what it means to be a Corps lake or project. An icon or "About This App" link should be included that would lead to a pop-up or separate page with the answers to the following questions: What is a Corps Lake? What can I find by using this app? What can I not find by using this app?
- Offer a cached or static version of the application which users can download or update before going to a Corps lake project. Some Corps projects, or areas within projects, do not

have adequate Internet access. In these situations, users should have the option of downloading a static version of pertinent information when Internet access is available.

- Remove the individual lake pages that include a box of navigation and a map. Instead, use the "Lake Info & Alerts" page as the individual lake page, and include the following information: Address, Phone Number, and Map and Directions links; Contact Us/Comments link; and a grid of icons for Alerts, Activities, Events, Nearby Attractions, Amenities & Facilities, General Information, Weather, List of Recreation Areas, and History. Remove the "Alerts" and "Links" headers on this page. Include the information from the Things To Do page within the related activity pages. More information should also be provided (on the General Information page), such as contact information for management or rangers, the time zone of the area and timing of peak seasons.

- Consider adding a feature on individual lake pages that will allow users to add a lake to their "Favorites," and provide access to this Favorites list in the bottom navigation and as a main link on the Homepage.

- Change the "Take Me There" link to "Directions." Provide this link as an option when users click on a map point (i.e., similar to a Directions link on a pop-up on Google maps), and on the individual lake pages.

- Re-word the "Tell Us What You Think" link to more expected or widely used terms such as "Contact Us," "Comments," or "Provide Feedback." Provide a rating system, a Product Review feature (i.e., to give one to five star ratings overall), and the open-ended comment box on this page, and consider adding a reviewing feature so users can view and tell others about their experiences. A link for the feedback page should be provided on the individual lake pages underneath the location/directions information.

- Divide Events into "Events at the Lake" and "Events in the Region," and provide a calendar.

- Re-word the "List of Lake Areas" link (on the individual lake pages) to "List of Recreation Areas." Add a table on this page that includes "Location," "Map," "Features," "Fees," etc.

- Provide a link to weather information for several days on individual park pages, and also include this link on related activity pages, such as Boating and Fishing Facilities. Many users mentioned that this information needs to be up-to-date and accessible at all times, and therefore if this will not be the case, consider removing the weather feature as there are numerous other weather applications that are usually included and offered on mobile devices and tablets.

- Provide general information about the activity areas, such as what facilities and amenities there are at each location. Links to pertinent information should also be provided within specific activity pages, such as websites for campground reservations (e.g., "Campsite availability and reservations" with a link to www.recreation.gov), rental information for pontoon boats, marina information, state parks on the lake and other options, etc.

- Include more information on the Boat Ramps page, such as photos, traffic flow, depth of boat ramps, what's nearby (e.g., marina, bait shop, rental options, etc.), map or directions, water levels, and hours.

- Add tables to the Picnic Areas, Biking, and Trails pages that are similar to the table on the Swim Areas page. The Picnic Areas table should include information on the different locations and what users can find at each area (e.g., "Features," "Open/Closed," "Fees," etc.), and the Biking and Trails table should provide details on each trail (e.g., "Location," "Map," "Distance," "Difficulty," "Restrictions," "Features," etc.).

- Add GPS locations and/or maps of underwater fish attractors (e.g., brush piles) on the Fishing Facilities page.

- Include a link to an external website for history ("Further Historical Information") that links the user to the lake website. The History pages for individual lakes on the application should only contain a limited amount of information.

Conclusions and Next Steps

We conclude that the CLG mobile app prototype demonstrates high potential for evolving into a usable, fully functional mobile application. Visitors at Corps of Engineers lakes were positive about the need for such an application, stating that they would likely use it if it were available and would recommend it to their friends. We recommend that the Corps of Engineers proceed with further development and evaluation of the mobile application, and consider renaming it "Corps Lakes Recreation" to give it a more accurate and recognizable identity.

Ideally, separate applications should be designed for smartphones and tablets, as these are two different platforms with different design and size expectations. The prototype was designed for a smartphone, but user evaluation was completed using a tablet. Throughout the evaluation, some of the links and interface elements appeared awkward on a tablet screen with a large amount of empty space. While the mobile application will operate on both platforms, separate applications that are designed specifically for each will provide a more user-friendly experience in terms of layout and aesthetics.

Lastly, we recommend exploring the development of a separate mobile application or website devoted to public participation where Corps stakeholders can find and comment on their recreation experiences, management issues, proposed regulations and planning documents. A public participation mobile application or website would provide for civic engagement with a wider range of Corps of Engineers planning and management activities than the CLG mobile application described in this report.

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Attachment 1 – Moderator's Guide

I. Overview of Study (3 minutes)

Thank you for agreeing to participate in our study. We are interested in obtaining your feedback about a mobile prototype for the U.S. Army Corps of Engineers, Corps Lakes Gateway website. We are trying to understanding how people might use the mobile prototype to find information about the lake.

In this session, I'll ask you to use the mobile prototype on a laptop, tablet, or smartphone on the Corps Lakes Gateway website while talking out loud. Remember that this is an evaluation of the mobile website's ease of use and not of your individual performance. You are testing this mobile prototype for us. After you have attempted the tasks, we will discuss your experience. Do you have any questions at this point?

Before we get started, we have some paperwork to get through.
- Consent form (**5 minutes**)
- Demographic questionnaire (**2 minutes**)

II. Task Instructions and Task Scenarios Performance (20 minutes)

- Orient the participant to the Corps Lakes Gateway mobile prototype.
- Ask participant to try the tasks.

III. Post-study Questionnaire (3 minutes)

- Ask participants to fill out the post-study questionnaire.
- Give participants their compensation.
- Give participants a hard copy of the debriefing information.

Attachment 2 – Informed Consent Form

Title of the research project: Role of Internet and Mobile Technologies in Knowledge Transfer, Knowledge Management and Public Participation in Outdoor Recreation

MSU's Office of University Outreach & Engagement is conducting a research study to evaluate the usability and accessibility of mobile website design concepts. User testing sessions are being conducted to gather this information. These sessions will be videotaped to ensure accuracy of comments and to assist in application of the findings. The findings from this research may be used to guide changes to improve the usability of the website.

If you chose to participate, you will be asked to fill out a demographic questionnaire, asked some questions while interacting with an outdoor recreation mobile website application, and asked a few questions about your experience after interacting with the website. Your participation will take approximately one-half hour. If you get frustrated with the online system, a facilitator will assist you or guide you to another task, or end the session. You may let the facilitator know if you are having difficulty, or need to take a break. You must be at least 18 years old to participate.

We don't anticipate any risk to participants for their participation. The information that you provide may be used to benefit future design of mobile applications.

Any information that you share will be kept confidential; your name will not be associated with your comments. The full videotapes will only be seen by the project team from the U.S. Army Corps of Engineers and MSU. Video clips may be used for informational materials about usability and accessibility testing. Your confidentiality will be protected to the maximum extent allowable by law. The evaluation materials will be stored in a locked location, accessible only by the project team and the IRB for a period of three years. At the end of the study, the hard copy session notes and surveys will be destroyed, but the IRB consent form, recordings, transcripts, and data analyses files will be stored on a secure server in the MSU Usability/Accessibility Research and Consulting lab for a period of three years.

Your participation is completely voluntary. You may choose not to participate at all, may refuse to participate in certain procedures or refuse to answer certain questions, or may discontinue your participation at any time without penalty. Your decision to participate will not affect your relationship with Michigan State University, University Outreach and Engagement, or the person who identified you as a potential participant. Agreeing to participate and signing this form does not waive any of your legal rights. Participants will receive $25 compensation for their time and participation.

If you have concerns or questions about this study, such as scientific issues, how to do any part of it, or to report an injury (i.e. physical, psychological, social, financial, or otherwise), please contact the Primary Investigator, Sarah Swierenga, by phone at (517) 353-8977 or by mail to Sarah Swierenga, Michigan State University, Kellogg Center, Garden Level, East Lansing, MI 48824.

If you have questions or concerns about your role and rights as a research participant, would like to obtain information or offer input, or would like to register a complaint about this study, you may contact, anonymously, if you wish, the Michigan State University's Human Research Protection Program at 517-355-2180, Fax 517-432-4503, or e-mail irb@msu.edu or regular mail at: 408 W. Circle Dr., Room 207 Olds Hall, MSU, East Lansing, MI 48824.

I voluntarily agree to participate in this research study.

Participant's Signature   Date

□ *By checking this box, I give my permission to videotape the session and allow the researchers to use the videotapes or highlight video clips publicly (e.g., educational materials or conference presentations).*

Researcher's Signature   Date

This consent form was approved by a Michigan State University Institutional Review Board.
Approved 05/23/2013 - valid through - 05/22/2014. This version supersedes all previous versions. IRB # 12-71

Attachment 3 – Demographic Questionnaire Responses

	Participant 1	Participant 2	Participant 3
Where do you live?	Harrodsburg, KY	Harrodsburg, KY	Harrodsburg, KY
Age	31	36	26
Do you own your own computer?	Yes	No	No
How often do you use the Internet as part of your job or education?	Every day	2-5 times per week	1-2 times per week
Which web search engine do you use most often?	Google	Google	Google
What browser do you use most often?	Mozilla Firefox	Internet Explorer	Internet Explorer
What platform do you usually use?	PC	PC	PC
What do you usually do when you visit a website?	Read all the navigation items then make a decision how to proceed; Scan the headings to find relevant information.	Immediately access the "search" and type in a keyword.	Immediately access the "search" and type in a keyword.
What types of activities do you perform using the Internet?	Check email; Check weather; Read news; Play games; Plan a trip or find a map; Shop online.	Check email; Check weather; Read news; Research; Play games.	Check weather; read news; plan a trip or find a map; shop online.
What are the main issues you have when you visit web sites?	Can't find what I'm looking for.	Can't find what I'm looking for.	Can't find what I'm looking for.

	Participant 4	Participant 5	Participant 6
Where do you live?	Campbellsville, KY	Mansfield, OH	Brodhead, KY
Age	57	72	23
Do you own your own computer?	Yes	Yes	Yes
How often do you use the Internet as part of your job or education?	Every day	Every day	Every day
Which web search engine do you use most often?	Google	Google	Google
What browser do you use most often?	Internet Explorer	Internet Explorer	Mozilla Firefox
What platform do you usually use?	PC	PC	PC
What do you usually do when you visit a website? (select all that apply)	Immediately access the "search" and type in a keyword.	Immediately access the "search" and type in a keyword.	Read the content on the homepage, then decide how to proceed.
What types of activities do you perform using the Internet? (select all that apply)	Check email; Read news; Research; Play games; Plan a trip or find a map; Shop online.	Check email; Check weather; Research; Plan a trip or find a map; Shop online.	Check email; Check weather; Read news; Play games; Plan a trip or find a map.
What are the main issues you have when you visit web sites?	None	Too many graphics make it hard to read.	If there's no search box, I am lost.

	Participant 7	**Participant 8**	**Participant 9**
Where do you live?	Middletown, KY	Big Clifty, KY	Cox's Creek, KY
Age	22	29	19
Do you own your own computer?	Yes	Yes	Yes
How often do you use the Internet as part of your job or education?	Every day	Every day	Every day
Which web search engine do you use most often?	Google	Google	Google
What browser do you use most often?	Other: Google Chrome	Mozilla Firefox	Other: Google Chrome
What platform do you usually use?	PC	PC	PC
What do you usually do when you visit a website? (select all that apply)	Scan the headings to find relevant information.	Scan the headings to find relevant information.	Read all the navigation items then make a decision how to proceed.
What types of activities do you perform using the Internet? (select all that apply)	Check email; Check weather; Read news; Chat/Instant Message; Research; Play games; Plan a trip or find a map; Shop online.	Check email; Check weather; Read news; Research; Play games; Plan a trip or find a map; Shop online.	Check email; Check weather; Research; Shop online.
What are the main issues you have when you visit web sites?	Can't find what I'm looking for.	Can't find what I'm looking for.	None

	Participant 10	**Participant 11**	**Participant 12**
Where do you live?	Vine Grove, KY	Bowling Green, KY	Bowling Green, KY
Age	52	38	54
Do you own your own computer?	Yes	Yes	Yes
How often do you use the Internet as part of your job or education?	Every day	Every day	Every day
Which web search engine do you use most often?	Other: Bing	Google	Google, Yahoo
What browser do you use most often?	Internet Explorer	Internet Explorer	Internet Explorer, Google Chrome
What platform do you usually use?	PC	PC	PC
What do you usually do when you visit a website? (select all that apply)	Scan the headings to find relevant information; Access the site map if one is available.	Read all the navigation items then make a decision how to proceed; Scan the headings to find relevant information; Immediately access the "search" and type in a keyword.	Read all the navigation items then make a decision how to proceed; Read the content on the homepage, then decide how to proceed; Immediately access the "search" and type in a keyword.
What types of activities do you perform using the Internet? (select all that apply)	Check email; Check weather; Read news; Research; Play games; Plan a trip or find a map; Shop online; Other.	Check email; Check weather; Read news; Research; Plan a trip or find a map; Shop online.	Check email; Check weather; Read news; Chat/Instant message; Research; Play games; Plan a trip or find a map; Shop online.
What are the main issues you have when you visit web sites?	—	Too many graphics make it hard to read.	Other: Slow loading page.

Attachment 4 – Task Scenarios

1a.   <u>Pre-trip</u> task: You'd like to go biking during your visit to Green (or Nolin) River Lake, but you aren't sure if the lake has biking trails. If the lake doesn't have biking trails, then you won't pack your bike and bike equipment. So, please use the mobile app to find out if Green (or Nolin) River Lake has biking trails and whether the trails are paved or unpaved.

1b.   <u>Pre-trip</u> task: Pretend you haven't left home yet, but you have decided that you'd like to spend the weekend at Green (or Nolin) River Lake. Find directions to Green (or Nolin) River Lake.

2a.   <u>At lake</u> task: You are thinking about going fishing tomorrow. Find tomorrow's weather report.

2b.   <u>At lake</u> task: The usual place where you launch your boat is closed for construction. Find out where the other boat launches at Green (or Nolin) River Lake are located and if they are open.

2c.   <u>At lake</u> task: The kids/grandkids are getting bored. Find out if there are any special events or things for the kids/grandkids to do at Green (or Nolin) River Lake.

2d.   <u>At lake</u> task: You'd like to find out what else there is to do or other attractions within the vicinity (30 miles, say) of Green (or Nolin) River Lake. Use the mobile app to find out what else there is to do in the area.

2e.   <u>At lake</u> task: You decide you would like to see a different part of the lake and have a picnic lunch. Use the mobile app to find a picnic area on a different part of the lake from where you are now.

3a.   <u>Post-trip</u> task: You want to let the management staff at Green (or Nolin) River Lake know what a great time you had during your recent stay. How would you use the mobile app to provide this feedback to lake management?

3b.   <u>Post-trip</u> task: Now that you've been there and had a great time, you want to know more about the history of Green (or Nolin) River Lake. How would you find information about the history of this lake?

4.   Now that you've explored the prototype a bit, we are wondering what you think you'd want to use this prototype for. What would you want to find? See if you can find it.

Attachment 5 – Task Results

Failures for tasks can be categorized as follows: gave up, stopped, or incorrect. If a user mentioned being unsure how to proceed further on a task, this failure was deemed "gave up." When users kept trying to determine how to complete a task and had spent a significant amount of time on a page without making progress, the moderator stopped the user and moved on the next task. If a user reached a page or section and believed they had completed the task when in fact he or she had not, this was considered "incorrect."

A few participants were given minimal help for some of the tasks. This involved telling the participants to click on the Green River or Nolin River map point when they were focused more on the list of navigation links on the Find Park page. A task was still considered completed if the user continued on after assistance and was successful in finding the correct information, and these times were included in the average time to perform a task successfully.

For some tasks, participants decided that using the built-in Search feature was needed to find the information, although the Search function was not currently working. While using this feature would be a viable option in a fully functioning application, in the case of these tasks if the participant concluded that using the Search feature was the only means for finding the information, then the task was considered a failure.

Task 1a. <u>Pre-trip</u>: You'd like to go biking during your visit to Green (or Nolin) River Lake, but you aren't sure if the lake has biking trails. If the lake doesn't have biking trails, then you won't pack your bike and bike equipment. So, please use the mobile app to find out if Green (or Nolin) River Lake has biking trails and whether the trails are paved or unpaved.

	Completed?	Completed with Minimal Help	Gave Up / Stopped / Incorrect	Time to Successfully Complete (minutes)	Time to Give up, be Stopped, or Incorrect (minutes)
P 1	Yes			0:06	
P 2	Yes			0:10	
P 3	Yes			0:10	
P 4	Yes			0:14	
P 5	Yes			0:35	
P 6	Yes			0:11	
P 7	Yes			1:04	
P 8	Yes			0:10	
P 9	Yes			0:11	
P 10	Yes			0:22	
P 11	Yes			0:42	
P 12	Yes			0:08	
TOTAL	**12/12**			**4:03**	
AVERAGE	**100%**			**0:20**	

Task 1b. <u>Pre-trip</u>: Pretend you haven't left home yet, but you have decided that you'd like to spend the weekend at Green (or Nolin) River Lake. Find directions to Green (or Nolin) River Lake.

	Completed?	Completed with Minimal Help	Gave Up / Stopped / Incorrect	Time to Successfully Complete (minutes)	Time to Give up, be Stopped, or be Incorrect (minutes)
P 1			Incorrect		1:34
P 2			Incorrect		0:30
P 3			Stopped		0:48
P 4	Yes			0:51	
P 5			Gave up		0:50
P 6			Stopped		3:00
P 7	Yes			0:54	
P 8			Incorrect		1:06
P 9			Incorrect		0:46
P 10			Incorrect		0:28
P 11			Incorrect		0:46
P 12			Incorrect		0:35
TOTAL	**2/12**		**10/12**	**1:45**	**10:23**
AVERAGE	**17%**		**83%**	**0:53**	**1:02**

Task 2a. <u>At lake</u>: You are thinking about going fishing tomorrow. Find tomorrow's weather report.

	Completed?	Completed with Minimal Help	Gave Up / Stopped / Incorrect	Time to Successfully Complete (minutes)	Time to Give up, be Stopped, or Incorrect (minutes)
P 1			Incorrect		0:23
P 2		Yes		1:36	
P 3			Incorrect		0:35
P 4		Yes		1:28	
P 5	Yes			0:16	
P 6			Incorrect		0:18
P 7	Yes			0:19	
P 8	Yes			1:26	
P 9	Yes			0:14	
P 10			Incorrect		1:13
P 11	Yes			0:21	
P 12			Incorrect		0:39
TOTAL	**5/12**	**2/12**	**5/12**	**340**	**3:08**
AVERAGE	**42%**	**17%**	**58%**	**1:08**	**0:27**

Task 2b. At lake: The usual place where you launch your boat is closed for construction. Find out where the other boat launches at Green (or Nolin) River Lake are located and if they are open.

	Completed?	Completed with Minimal Help	Gave Up / Stopped / Incorrect	Time to Successfully Complete (minutes)	Time to Give up, be Stopped, or Incorrect (minutes)
P 1			Incorrect		1:14
P 2	Yes			0:07	
P 3	Yes			0:08	
P 4			Incorrect		0:53
P 5			Incorrect		0:42
P 6			Incorrect		1:47
P 7	Yes			0:17	
P 8	Yes			0:08	
P 9	Yes			0:05	
P 10	Yes			0:17	
P 11			Incorrect		0:33
P 12	Yes			1:10	
TOTAL	**7/12**		**5/12**	**2:12**	**5:09**
AVERAGE	**58%**		**42%**	**0:19**	**1:02**

Task 2c. At lake: The kids/grandkids are getting bored. Find out if there are any special events or things for the kids/grandkids to do at Green (or Nolin) River Lake.

	Completed?	Completed with Minimal Help	Gave Up / Stopped / Incorrect	Time to Successfully Complete (minutes)	Time to Give up, be Stopped, or Incorrect (minutes)
P 1			Incorrect		1:47
P 2			Incorrect		0:30
P 3			Stopped		0:32
P 4			Incorrect		1:28
P 6			Incorrect		0:28
P 7			Incorrect		0:48
P 8			Incorrect		0:24
P 9			Incorrect		0:20
P 10			Incorrect		1:06
P 11			Incorrect		0:45
P 12			Incorrect		0:33
TOTAL	**0/11**		**11/11**		**8:41**
AVERAGE	**0%**		**100%**		**0:47**

Task 2d. <u>At lake</u>: You'd like to find out what else there is to do or other attractions within the vicinity (30 miles, say) of Green (or Nolin) River Lake. Use the mobile app to find out what else there is to do in the area.

	Completed?	Completed with Minimal Help	Gave Up / Stopped / Incorrect	Time to Successfully Complete (minutes)	Time to Give up, be Stopped, or Incorrect (minutes)
P 1			Incorrect		0:50
P 2			Incorrect		1:02
P 3			Stopped		1:15
P 6			Incorrect		0:30
P 7			Incorrect		0:38
TOTAL	**0/5**		**5/5**		**4:15**
AVERAGE	**0%**		**100%**		**0:51**

Task 2e. <u>At lake</u>: You decide you would like to see a different part of the lake and have a picnic lunch. Use the mobile app to find a picnic area on a different part of the lake from where you are now.

	Completed?	Completed with Minimal Help	Gave Up / Stopped / Incorrect	Time to Successfully Complete (minutes)	Time to Give up, be Stopped, or Incorrect (minutes)
P 1	Yes			0:56	
P 2	Yes			0:10	
P 3	Yes			0:08	
P 4	Yes			0:11	
P 5	Yes			1:06	
P 7	Yes			0:10	
P 8	Yes			1:03	
P 9	Yes			0:13	
P 10	Yes			0:08	
P 11	Yes			0:14	
P 12	Yes			0:24	
TOTAL	**11/11**			**4:43**	
AVERAGE	**100%**			**0:26**	

Task 3a. <u>Post-trip</u>: You want to let the management staff at Green (or Nolin) River Lake know what a great time you had during your recent stay. How would you use the mobile app to provide this feedback to lake management?

	Completed?	Completed with Minimal Help	Gave Up / Stopped / Incorrect	Time to Successfully Complete (minutes)	Time to Give up, be Stopped, or Incorrect (minutes)
P 1			Incorrect		0:32
P 2	Yes			0:46	
P 3		Yes		1:17	
P 4		Yes		2:21	
P 5			Gave up		0:45
P 6	Yes			0:39	
P 7	Yes			0:30	
P 8			Incorrect		1:21
P 9	Yes			0:37	
P 10		Yes		0:55	
P 11	Yes			1:06	
P 12			Incorrect		0:56
TOTAL	**5/12**	**3/12**	**4/12**	**7:11**	**3:34**
AVERAGE	**42%**	**25%**	**33%**	**1:22**	**0:36**

Task 3b. <u>Post-trip</u>: Now that you've been there and had a great time, you want to know more about the history of Green (or Nolin) River Lake. How would you find information about the history of this lake?

	Completed?	Completed with Minimal Help	Gave Up / Stopped / Incorrect	Time to Successfully Complete (minutes)	Time to Give up, be Stopped, or Incorrect (minutes)
P 2	Yes			0:20	
P 3	Yes			0:33	
P 5	Yes			0:34	
P 6	Yes			0:18	
P 7	Yes			0:34	
P 8	Yes			0:17	
P 9	Yes			0:16	
P 10		Yes		0:24	
TOTAL	**7/12**	**1/12**		**3:16**	
AVERAGE	**87%**	**13%**		**0:25**	

Attachment 6 – Post-Study Questionnaire Results

1. Overall, the Corps Lakes Gateway mobile prototype was easy-to-use.

|	1 Strongly disagree	2 Somewhat Disagree	3 Slightly disagree	4 Neither agree or disagree	5 Slightly agree	6 Somewhat agree	7 Strongly agree	Average Rating
Overall			1			3	5	6.3

Why?
- Participant 1 (rating 6): A little more detail on the front page.
- Participant 2 (7): Find a lot of information.
- Participant 3 (7): You click on something and it was what I was looking for.
- Participant 4 (7): Very helpful.
- Participant 5 (6): It is similar to other web info.
- Participant 7 (6): I feel the operations could be smoother.
- Participant 9 (7): It made finding the info I needed easy. I was able to find all the links without hassle.
- Participant 10 (7): Easily navigated.
- Participant 12 (3): Has to click too many pages.

2. The content of the Corps Lakes Gateway website met my expectations.

	1 Strongly disagree	2 Somewhat Disagree	3 Slightly disagree	4 Neither agree or disagree	5 Slightly agree	6 Somewhat agree	7 Strongly agree	Average Rating
Overall			1	1		6	4	5.9

Why?
- Participant 1 (6): Had lots of good and useful info.
- Participant 3 (6): It was easy to use.
- Participant 4 (7): What to expect.
- Participant 5 (4): Website needs to be further along.
- Participant 6 (6): More fishing information.
- Participant 7 (7): I saw everything I could've expected.
- Participant 9 (6): It could have more maps, pictures, etc.
- Participant 10 (6): Easily navigated.
- Participant 12 (3): Can add more sections for weather and easier navigation.

3. Overall, it was easy to understand the organization of the mobile prototype screens, especially the menu levels and the flow of the screens.

	1 Strongly disagree	2 Somewhat Disagree	3 Slightly disagree	4 Neither agree or disagree	5 Slightly agree	6 Somewhat agree	7 Strongly agree	Average Rating
Overall		1				7	4	6

Why?
- Participant 1 (6): Once again, a little more detail.
- Participant 3 (6): I don't use web that much but this was easy to use.
- Participant 4 (6): More to choose from.
- Participant 9 (7): The links were large and easy to find.
- Participant 12 (2): Needs fewer pages and more app options.

4. How useful do you find the Corps Lakes Gateway mobile prototype to be?

	1 Not at all	2 Of little use	3 Neutral	4 Somewhat useful	5 Very useful	Average Rating
Overall			1	1	10	4.8

Why?
- Participant 1 (5): Had all the types of information I'd be looking for.
- Participant 3 (5): It tells you everything you need to know.
- Participant 4 (5): Finding boat ramps and activities.
- Participant 5 (3): I don't use my smart phone for this type of info.
- Participant 6 (5): Not many apps out there for fishing for activities around the area.
- Participant 9 (5): All info that I would need.
- Participant 10 (5): Clear, concise, to the point.
- Participant 11 (5): It has listings of all ramps, what activities are close in the area.

5. I would recommend the Corps Lakes Gateway mobile prototype to my colleagues and friends.

	1 Strongly disagree	2 Somewhat Disagree	3 Slightly disagree	4 Neither agree or disagree	5 Slightly agree	6 Somewhat agree	7 Strongly agree	Average Rating
Overall				1		2	9	6.6

Why?
- Participant 1 (7): One of a kind, helpful app for outdoors people.
- Participant 3 (7): It's great.
- Participant 4 (7): It's helpful.
- Participant 5 (4): Just the ones who always use their phone.
- Participant 6 (7): My fishing friends would find this helpful.
- Participant 8 (7): It would be great to reserve on the spot.
- Participant 12 (6): When you improve it.

6. Additional comments and/or recommendations for future enhancements:

- Participant 1: Front page may need a few more tabs with information readily available. Weather, camp availability, etc.
- Participant 2: It helps for people who need information about a lake or state park.
- Participant 3: Most of it is pretty good.
- Participant 4: Add the USACE brush pile locations.
- Participant 7: I feel this app is a great idea and will be very useful for the outdoors enthusiast.
- Participant 9: Pictures, maps, levels of crowdedness, water level, etc.
- Participant 10: A good app and useable on a tablet or phone.
- Participant 12: Pamphlets at the gates as well for activities.

Attachment 7 – Flowchart and Screenshots of Mobile Prototype

Homepage
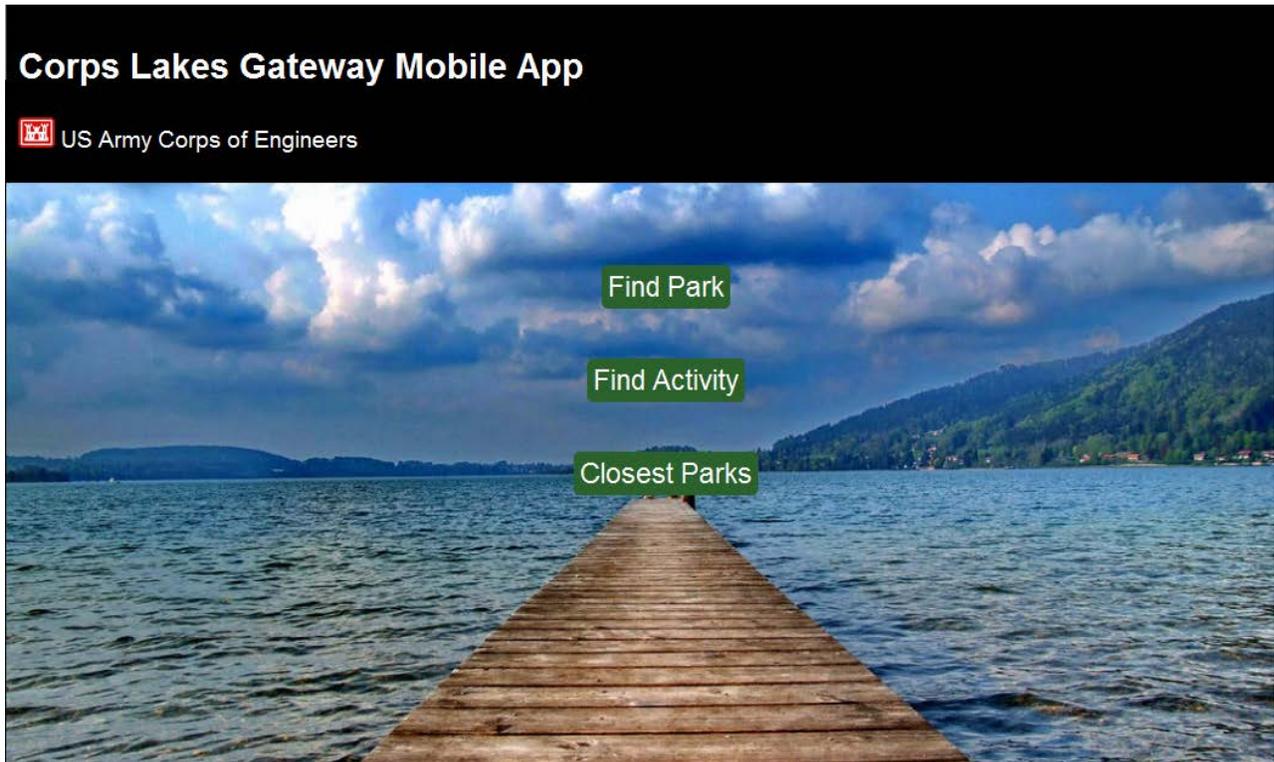
Find Park
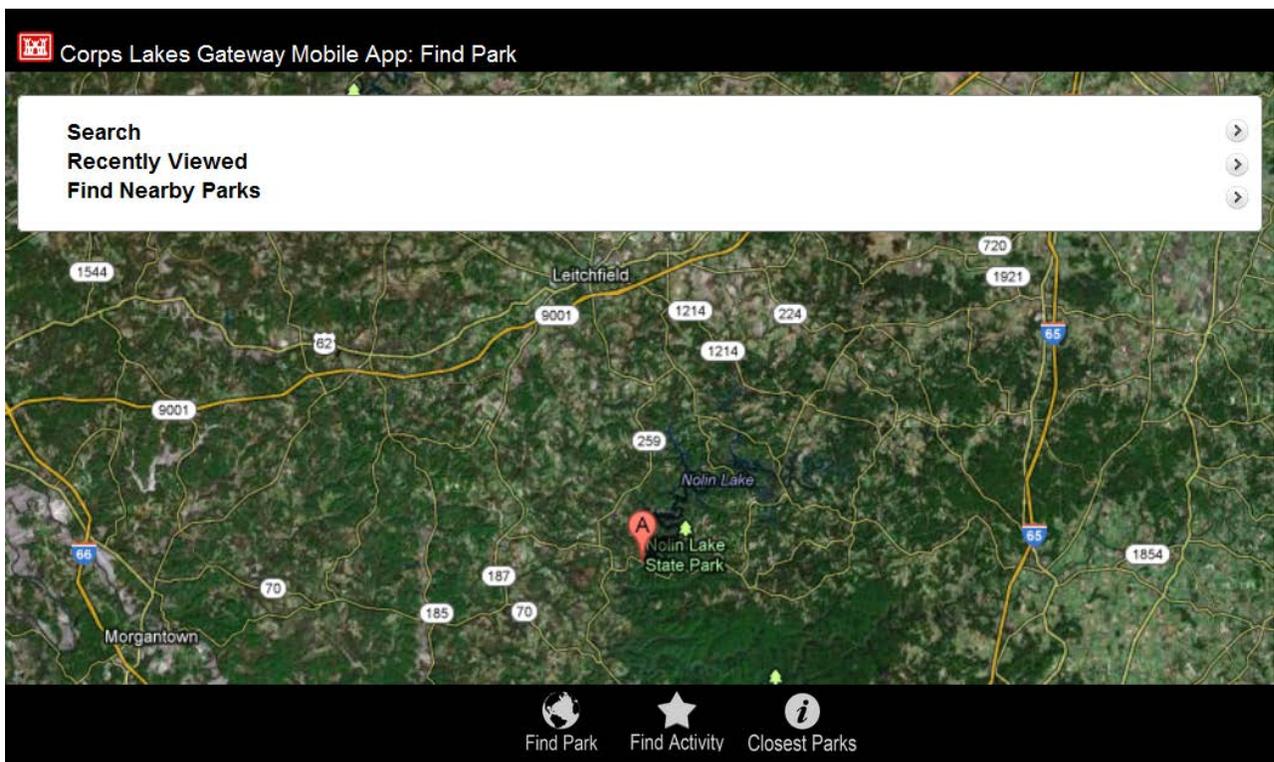
Find Activity
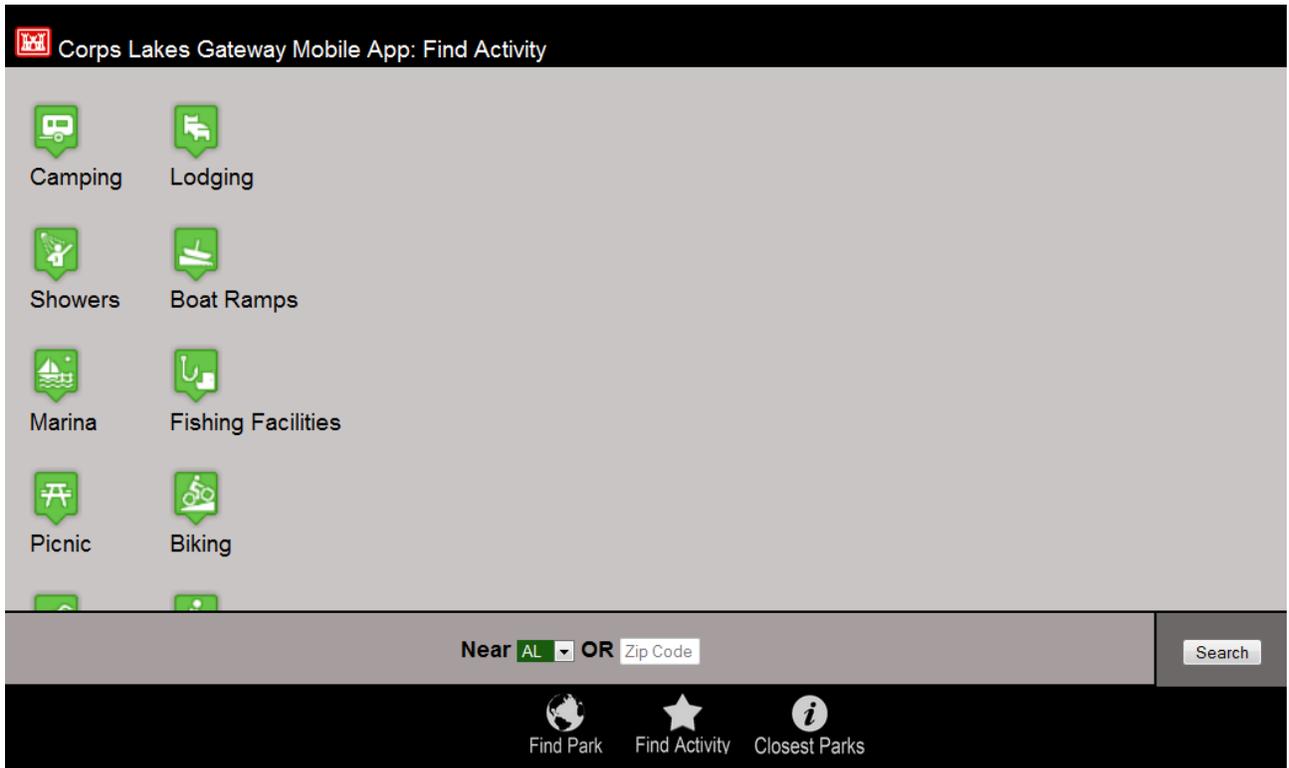
Closest Parks
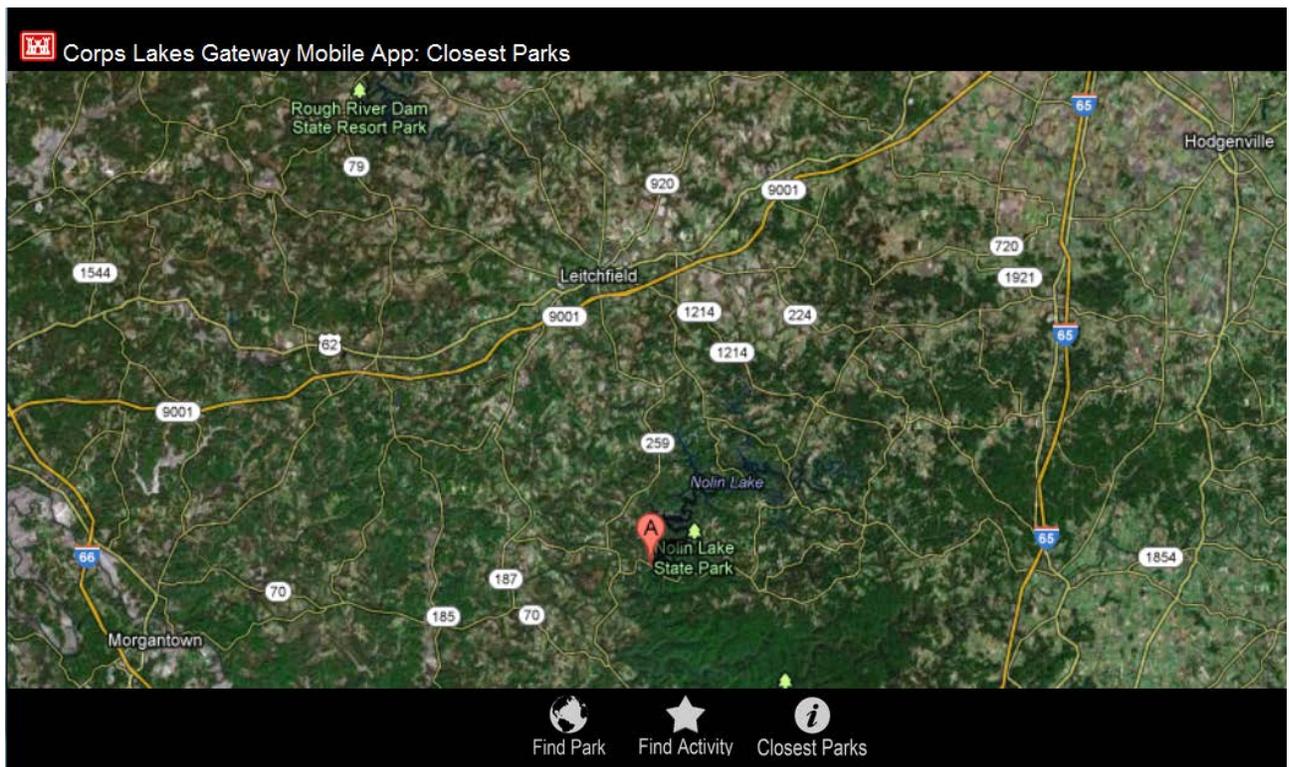
Nolin River (individual lake page)
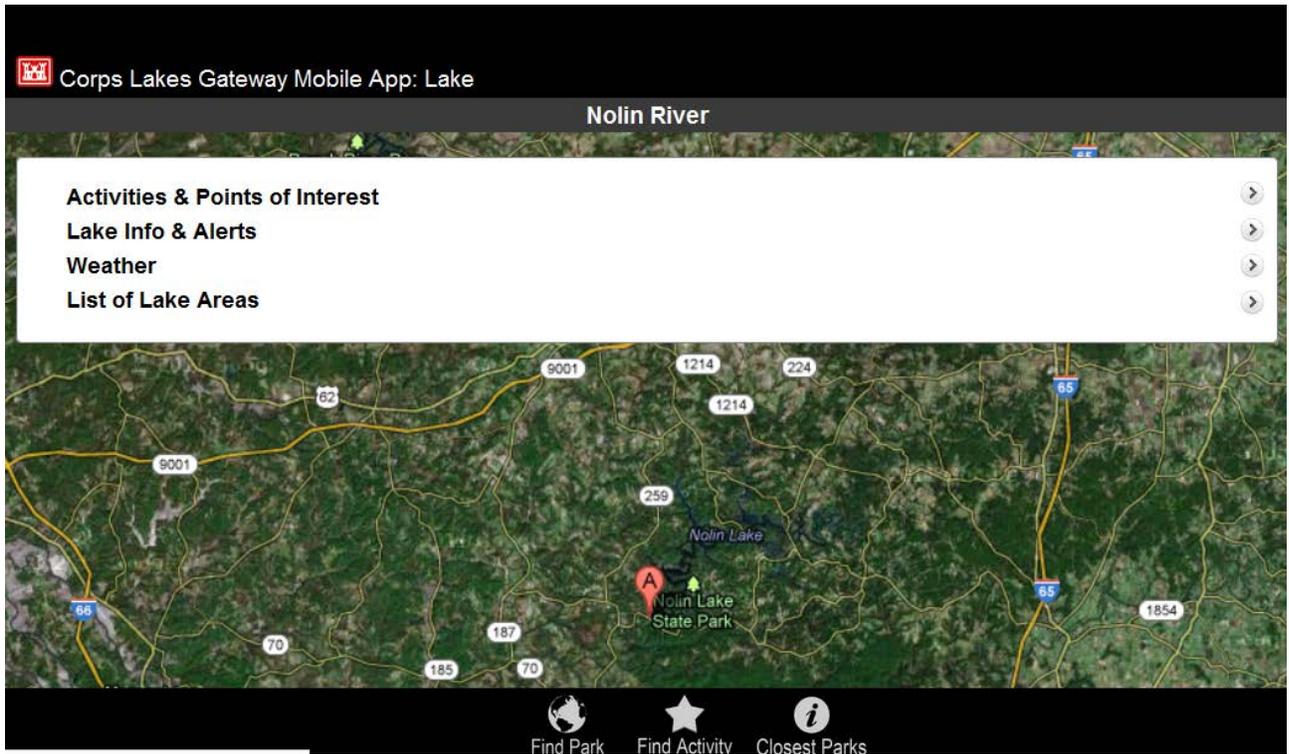
Activities & Points of Interest
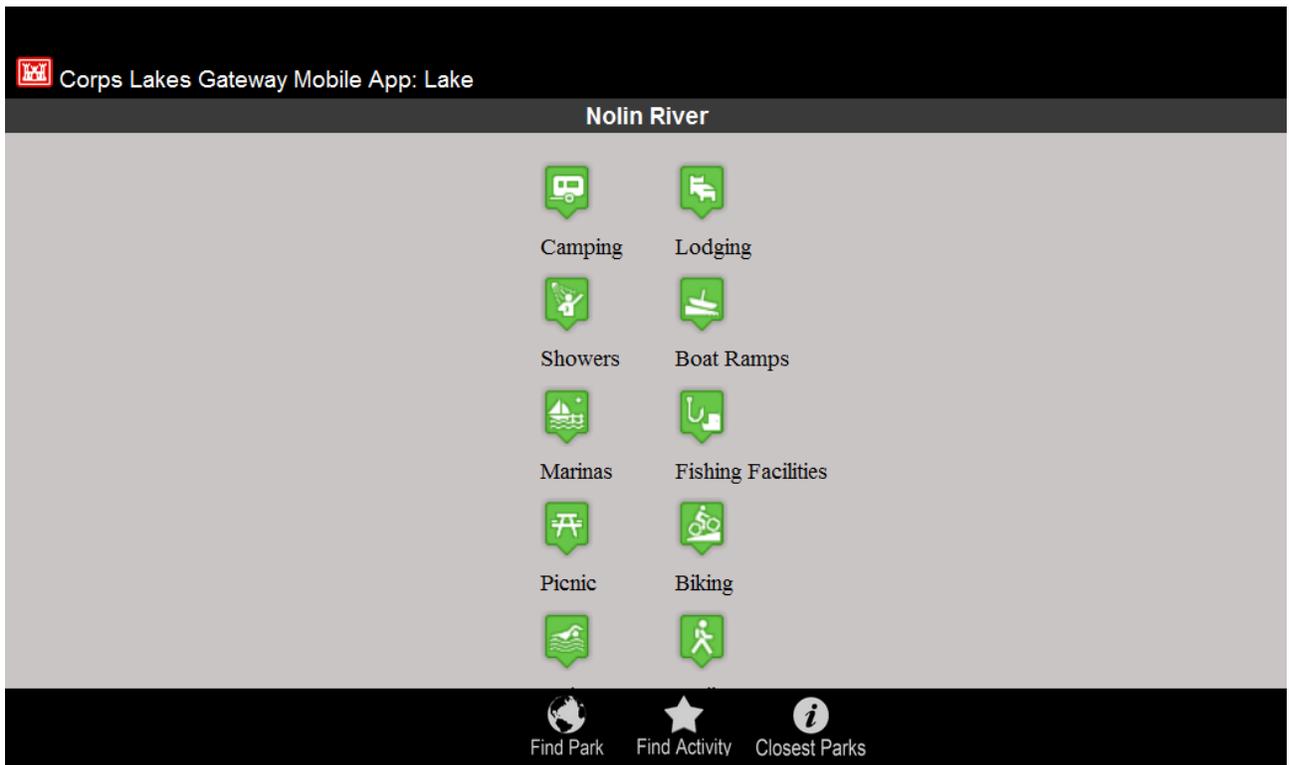
Camping

Corps Lakes Gateway Mobile App: Lake

Nolin River

Camping

Dog Creek   Moutardier   Wax

Dog Creek

- Location: Hart County
- CENTRAL TIME ZONE
- Opens early May; closes late September (attendants on duty)
- 70 campsites, 50 with electric and water hookup; 2 sites adapted for disabled persons
- Camping fees $14 - $22 (depending on site type)
- Other features: swimming area available to registered campers only, boat ramp and playground adjacent to campground, showers, dump station, group picnic shelter, pit restrooms, and watchable wildlife area
- Easy access to shoreline

- For more information

Top

Moutardier

Find Park   Find Activity   Closest Parks

Boat Ramps

Corps Lakes Gateway Mobile App: Lake

Nolin River

Boat Ramps

Boat Ramp	Features	Open/Closed	Location	Daily Fee
VanMeter (Dam Site)				$3.00
Dog Creek Ramp				$3.00
Iberia Ramp				$3.00
Moutardier Ramp				$3.00
Wax Ramp Ramp				$3.00
Tailwater River Ramp				None
Brier Creek Ramp				None
Bacon Creek				None
Ponderosa Marina				None

Find Park   Find Activity   Closest Parks

Marinas

Picnic Areas

Biking

Corps Lakes Gateway Mobile App: Lake

Nolin River

Trails

The Nolin Lake State Park offers a dynamic biking trail, featuring the Waterfall Loop (1.9 miles) and the Omega Loop (2.2 miles). KYMBA (Kentucky Mountain Biking Association, Kentucky State Parks and the USACE (US Army Corps of Engineers) partnered to design and construct the Brier Creek Trail System. Work is currently underway to expand the trail to an eventual 9.5 miles of trail, including the Campground Connector, a ½ mile "Beginner" trail.

Nolin Lake State Park Trail

1.6 mile hiking trail, waterfall depending on conditions, moderate difficulty

- Hiking

Find Park   Find Activity   Closest Parks

Swim Areas

Corps Lakes Gateway Mobile App: Lake

Nolin River

Swim Areas

No lifeguards, swim at own risk

Location	Features	Open/Closed	Fees
Brier Creek			
Dog Creek			
Iberia			

Find Park   Find Activity   Closest Parks

Lake Info & Alerts

Take Me There
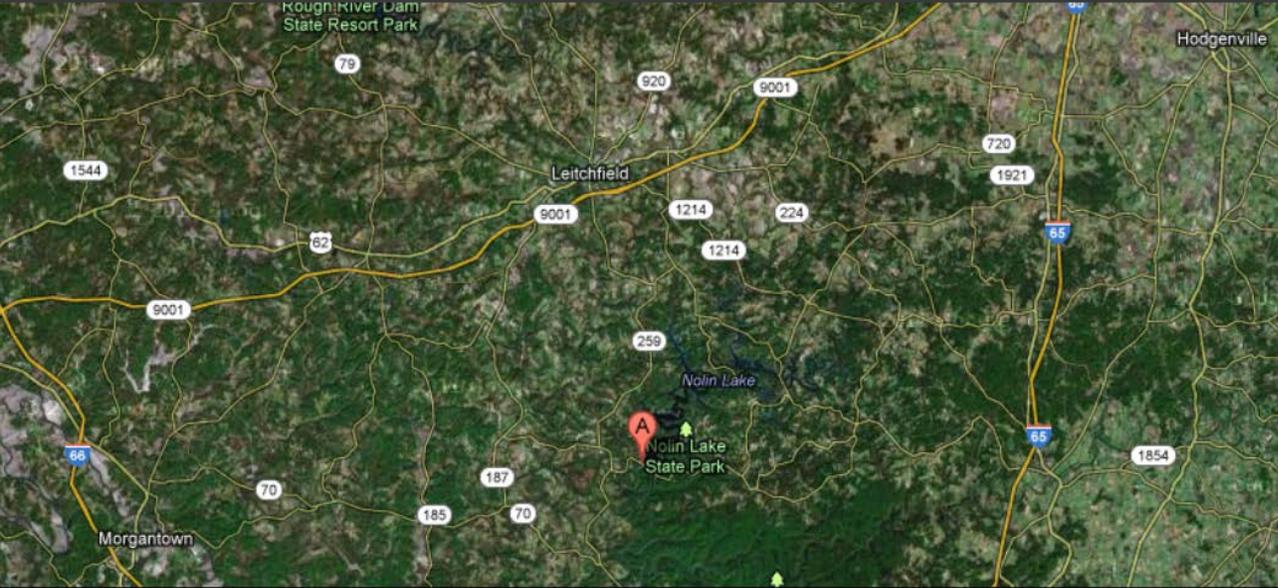
History

Corps Lakes Gateway Mobile App: Lake

Nolin River

History

Established May 2001

- Dam completed in 1963; construction authorized by Flood Control Act of 1938
- 5,795 acre lake
- Along northern edge of Mammoth Cave National Park
- Topographically diverse; part of "cave country"
- Mostly in Edmonson County, named for Capt. John Edmondson of Virginia, who was killed at the Battle of the River Raisin in the War of 1812
- The Nolin River is named for the early American explorer and Kentucky militia member, Benjamin Lynn
- Early settlers came mostly from Nordic regions and France
- Managed for flood control and recreation; lake supplies drinking water to surrounding area, fish and wildlife habitat
- Wide variety of outdoor recreation facilities, including campgrounds, boat ramps, picnic shelters and beaches

Find Park   Find Activity   Closest Parks

Things To Do

Corps Lakes Gateway Mobile App: Lake

Nolin River

Things To Do

Birding

- Great Blue Heron, Canada Geese, Wild Turkey abundant in fall/winter
- Sandhill Cranes, Canadian Geese, Wild Turkey, and Bald Eagle in spring

Boating

- 5 Corps-operated boat ramps
- $3 fee; annual passes available
- Nolin State Park ramp is free

Camping

- 3 Corps-operated campgrounds: Dog Creek, Moutardier, & Wax
- Nolin State Park also has campground

Fishing

Find Park   Find Activity   Closest Parks

Events

Corps Lakes Gateway Mobile App: Lake

Nolin River

Events

Summer Splash and Fireworks Show

June 22, 2013

2998 Brier Creek Road
Nolin Lake State Park
Mammoth Cave, KY 42259
Take me there ›

We will start the morning off with a wildflower hike. Throughout the afternoon we will offer events for the children to get them outdoors. Food vendors and adventure tourism will be set up. There will be music provided by the Friends of Nolin Lake and to top of the evening we will have a houseboat hop with fireworks at dark.

Find Park   Find Activity   Closest Parks

Nearby Parks and Attractions

Corps Lakes Gateway Mobile App: Lake

Nolin River

Nearby Parks and Attractions

Abraham Lincoln Birthplace National Historical Park

2995 Lincoln Farm Road
Hodgenville, KY 42748
Take me there ›
(270) 358-3137

For over a century people from around the world have come to rural Central Kentucky to honor the humble beginnings of our 16th president, Abraham Lincoln. His early life on Kentucky's frontier shaped his character and prepared him to lead the nation through Civil War. The country's first memorial to Lincoln, built with donations from young and old, enshrines the symbolic birthplace cabin.

Kendall Campground

Find Park   Find Activity   Closest Parks

Tell Us What You Think

Weather
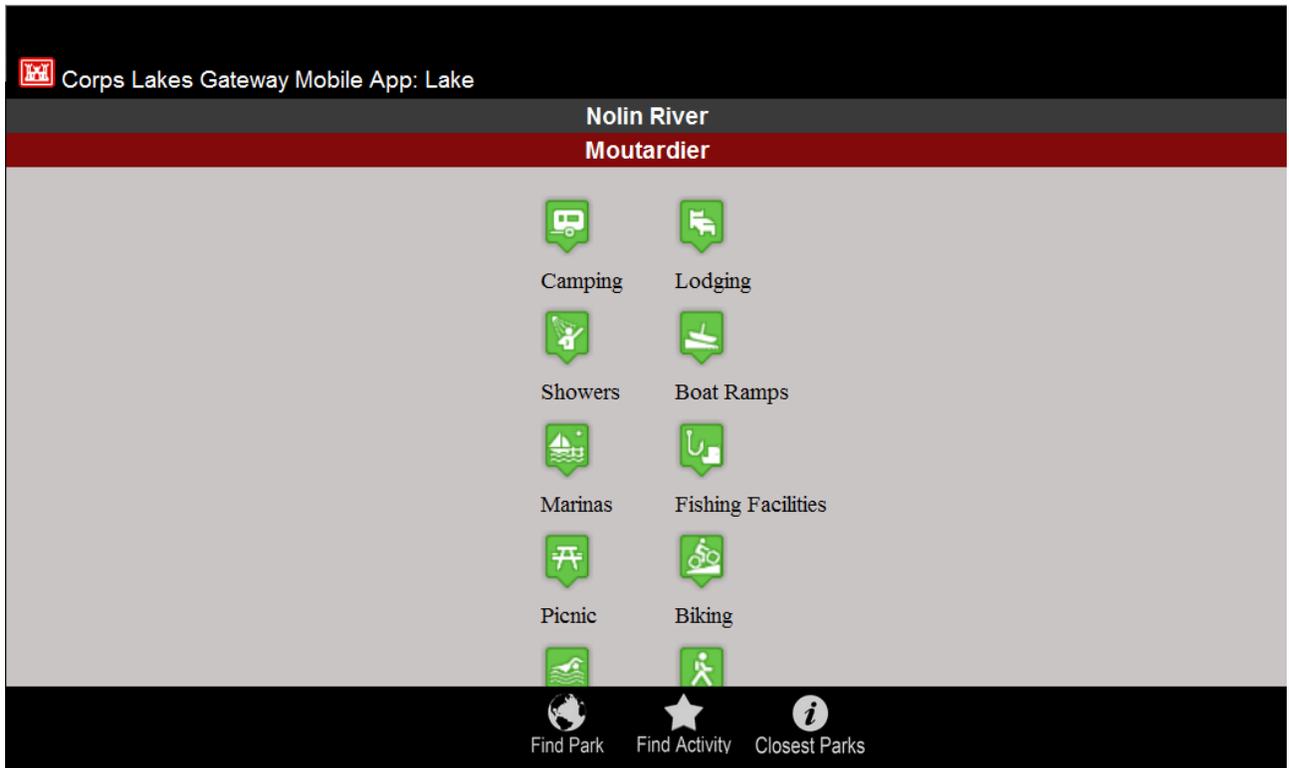
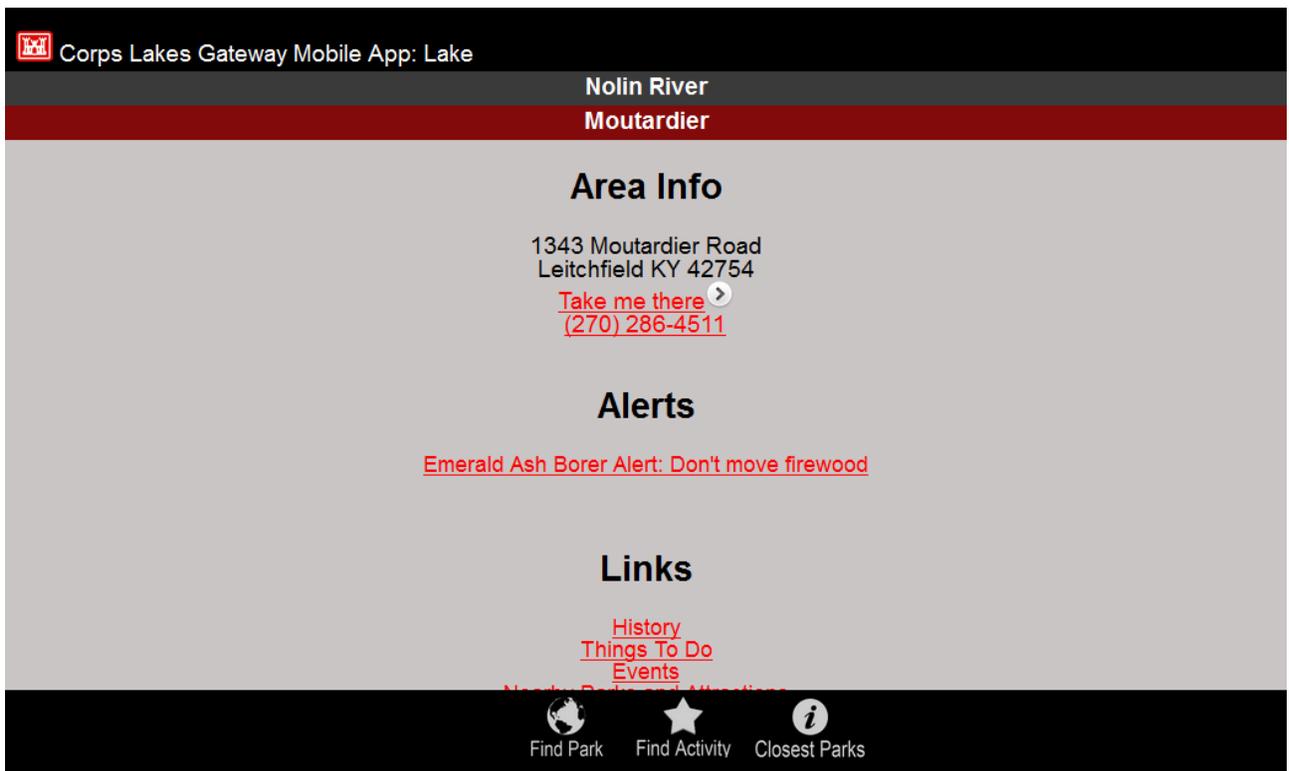**List of Lake Areas**

Moutardier (individual lake area page)
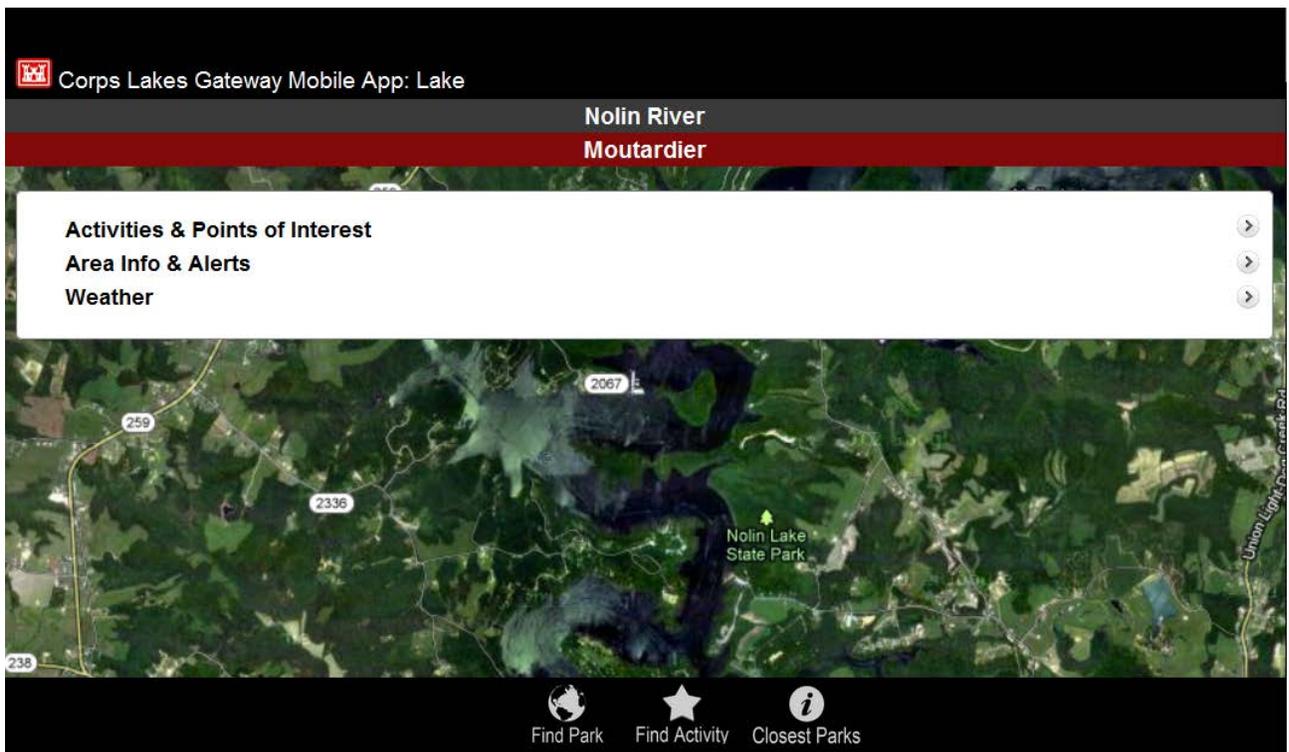
Activities & Points of Interest

Area Info & Alerts

Weather