

# **Bradbury Science Museum Summer 2014**

Mireya Rodriguez  
Elizabeth Starks

# Mobile App Design/Development

Mireya and I developed an iPad app for exhibit interactive to highlight the biological research of flora and fauna on LANL property for EPA compliance.

The purpose of the app is to show off how research is done there, what types of bats and owls live there, and adding fun and interaction to the exhibit.

**environmental  
research & monitoring**

**EXHIBIT GRAND OPENING**

Did you know Laboratory property has a 5,500-year history of occupation? That three threatened and endangered species call this area their home?

Find out how Los Alamos researchers are studying our rich cultural and biological diversity, and trying to understand local climate change and plan a sustainable future.



**Wednesday  
September 17  
4-7 PM**

- Take a free tree seedling to plant in your yard.
- Pick up a free water bottle
- Listen to a talk at 6 p.m. on the Lab's annual environmental report.

*Please join us for an opening reception beginning at 4 p.m., with remarks at 5 p.m. Refreshments will be served.*



REGULAR HOURS:  
Tuesday–Saturday, 10–5  
Sunday & Monday, 1–5

505-667-4444  
[www.lanl.gov/museum](http://www.lanl.gov/museum)

BRADBURY



LOS ALAMOS NATIONAL LABORATORY

# The Exhibit: *Environmental Research & Monitoring*

# Development Tools

We used Javascript / HTML5 / CSS3 to develop and design the app, using the Cordova PhoneGap wrapper, which exports to iOS or Android (iOS only in this case).

The application is now available for download from the iTunes store.



# The Backend

```
Sublime Text 2  File  Edit  Selection  Find  View  Goto  Tools  Project  Window  Help
owl.batapp
viewAssembler.js — owl.batapp

FOLDERS
owl.batapp
hooks
Index
merges
platforms
plugins
www
assets
js
libs
splitviewnavigator
splitviewnavigator.css
splitviewnavigator.js
viewnavigator
application.js
viewAssembler.js
views
aboutViewTemplate.html
batViewTemplate.html
biologistViewTemplate.html
defaultViewTemplate.html
funFactsViewTemplate.html
owlViewTemplate.html
quizViewTemplate.html
searchResultsViewTemplate.html
searchViewTemplate.html
singleBatMapViewTemplate.html
singleOwlViewTemplate.html
xml
bats.xml
biologist.xml
owls.json
owls.xml
data.js
index.html
config.xml

viewAssembler.js
1
2 var templates = {
3   aboutViewTemplate: "views/aboutViewTemplate.html",
4   defaultViewTemplate: "views/defaultViewTemplate.html",
5   owlViewTemplate: "views/owlViewTemplate.html",
6   findMarketsNearMeViewTemplate: "views/findMarketsNearMeViewTemplate.html",
7   geoPermissionDeniedViewTemplate: "views/geoPermissionDeniedViewTemplate.html",
8   mapViewTemplate: "views/mppViewTemplate.html",
9   marketDetailsViewTemplate: "views/marketDetailsViewTemplate.html",
10  marketMapViewTemplate: "views/marketMapViewTemplate.html",
11  marketsNearMeViewTemplate: "views/marketsNearMeViewTemplate.html",
12  searchResultsViewTemplate: "views/searchResultsViewTemplate.html",
13  searchViewTemplate: "views/searchViewTemplate.html",
14
15  loaded: 0,
16  requested: 0
17 };
18
19 var __templatesLoadedCallback;
20
21 function loadTemplates(callback) {
22   __templatesLoadedCallback = callback;
23
24   //load Mousetache HTML templates
25   for (var key in templates) {
26     (function() {
27       var _key = key.toString();
28       if ( _key != "loaded" && _key != "requested" ) {
29         templates.requested ++;
30
31         var templateLoaded = function( template ){
32           onTemplateLoaded( template, _key );
33         }
34
35         $.get( templates[ _key ], templateLoaded, "html" );
36       }
37     })();
38   }
39 }
40
41 function onTemplateLoaded(template, key) {
42
43   //alert( key + ": " + template);
44   templates[ key ] = template;
45   templates.loaded ++;
46
47   if ( templates.loaded == templates.requested ) {
48     __templatesLoadedCallback();
49   }
50 }
```

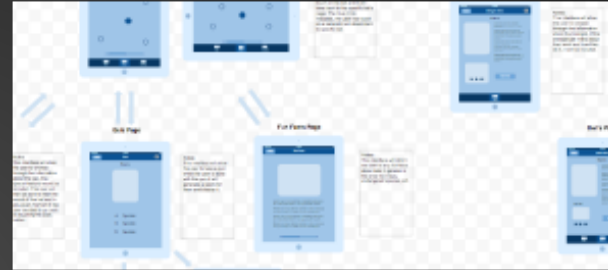
```
application  Find  View  Goto  Tools  Project  Window  Help
application.js — owl.batapp

viewAssembler.js
189
190   for ( i = 0; i < data.length; i++ ) {
191     var icon = data[i].firstChild.nodeValue;
192     owlsIcon = icon;
193   }
194   return;
195 }
196
197 function onOwlsViewClick( event ) {
198   var view = {
199     title: "Choose an Owl",
200     view: viewAssembler.owlView()
201   };
202
203   window.viewNavigator.pushView( view );
204 }
205
206 function onBatsViewClick( event ) {
207   var view = { title: "List",
208               view: viewAssembler.searchView(),
209               };
210   window.viewNavigator.pushView( view );
211   event.stopPropagation();
212   return false;
213 }
214
215 function onBioViewClick( event ) {
216   var view = { title: "Nearby",
217               view: viewAssembler.findNearbyView()
218               };
219   window.viewNavigator.pushView( view );
220 }
221
222 //acquire location
223 navigator.geolocation.getCurrentPosition( onGeoSuccess, onGeoError,
224                                           event.stopPropagation(),
225                                           return false;
226 }
227
228 var onGeoSuccess = function(position) {
229   /* console.log('Latitude: ' + position.coords.latitude
230                  'Longitude: ' + position.coords.longitude
231                  'Altitude: ' + position.coords.altitude
232                  'Accuracy: ' + position.coords.accuracy
233                  'Altitude Accuracy: ' + position.coords.altitudeAccuracy
234                  'Heading: ' + position.coords.heading
235                  'Speed: ' + position.coords.speed
236                  'Timestamp: ' + new Date(position.timestamp)
237                  ');
238 }
239 */
240 }
241 }
242 }
```

# Design

We consulted with exhibit design team and biologists to determine user interface, what the app should do, and what content should go in it.

Using exhibit design swatches and typefaces, we matched the exhibit design and designed icons in Adobe Illustrator.



# Content

**Flammulated Owl**



*Psilosops flammeolus*

A small owl of mountain pine forests, the Flammulated Owl is common in scattered localities throughout the West. It has short, feathered ear tufts, dark eyes, and is gray or brownish gray.

**Adult Size:** Small Owls  
**Diet:** Subsists nearly entirely on insects, especially crickets, moths, and beetles  
**Habitat:** Breeds in open pine forest in mountains, especially Ponderosa pine forest

**Did you Know?**

Although the Flammulated Owl is one of the smallest owls, its hoot is one of the lowest- frequency owl songs in North America

▶ Play Call

**Sourcing content:**  
found resources and  
acquired permission,  
edited audio and images;  
created templates for  
content developers to use.

# Content Sources



Cornell Ornithology Lab,  
BatCON, LANL Wildlife  
biologists, Bradbury  
Science Museum  
exhibit developers



# Installation



# Installation



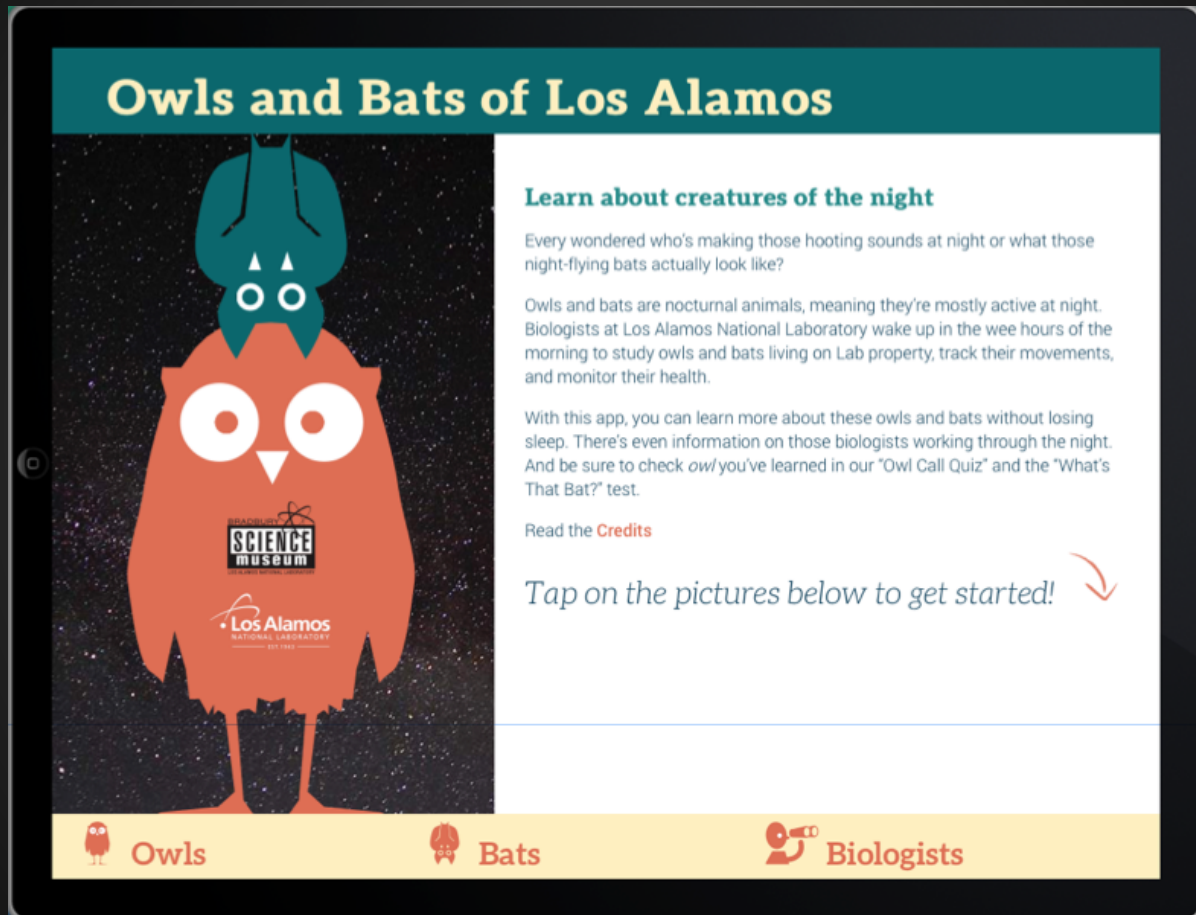
# Installation



# Installation



# Screen shots



# Screen shots



# Screen shots

## Flammulated Owl



### *Psiloscops flammeolus*

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▶ Play Call



Back to Owls

# Screen shots

## Hoo's that? Name that Owl


*Play the Owl Call, then  
choose the correct name*

 ▶ Play Call

- Western Screech-Owl**
- Flammulated Owl
- Great Horned Owl

[Next Question >>](#)

Score: 0 right answers out of 5 possible.

 [Back to Owls](#)



# Screen shots



# Screen shots

## Big Brown Bat



### *Eptesicus fuscus*

Big Brown Bats clearly rank among America's most beneficial animals. A colony of 150 Big Brown Bats can consume enough adult cucumber beetles in one summer to prevent egg-laying that would produce 33 million root-worm larvae, a major pest of corn. Their common maternity roosts today can be found in buildings, barns, bridges, and even bat houses.

**Habitat:** Found in virtually every American habitat from timberline meadows to lowland deserts, though most abundant in deciduous forest areas.

**Adult Size:** 87–138 mm (3.4–5.4 inches)

**Diet:** Small beetles are their most frequent prey, yet they will consume prodigious quantities of a wide variety of night-flying insects.

### Did you Know?

Numerous feeding studies indicate Big Brown Bats consume significant crop and forest pests including ground beetles, scarab beetles, cucumber beetles, snout beetles, and stink bugs, in addition to numerous species of moths and leafhoppers.



Back to Bats

# Screen shots

## Bat Fun Facts

### A Nice Summer Home

Of the 27 bat species living in New Mexico, 15 live on Lab property, or at least use the area for their summer home. Some of these bat species migrate to Mexico or farther south for the winter.

### Holy Backpack, Batman!

To monitor bat populations, Lab biologists use specialized tracking and detection equipment. To find bats, biologists use bat detectors to pick up a bat's ultrasonic calls, which are often two to three times higher than the level of human hearing. To track bats, biologists put a tiny "backpack" on a bat. The figure-eight-shaped backpack fits over their wings, weighs less than a gram, and carries a radio transmitter. After a few weeks, the thin elastic straps disintegrate and the backpack falls off—just enough time to track where they live and nest. Holy bat tracking!

### Natural Pest Control

Bats eat bugs—lots of them—making them very beneficial to have around. Some bats will consume up to their body weight in pesky insects every night. Many bats also are as busy as bees pollinating plants and trees.

### Bat Houses

Just like some birds live in birdhouses, bats will roost in bat houses. For their sleeping quarters, bats prefer warm, out-of-the-way locations; a south-facing second-story location is ideal. They're also particular about their house dimensions. Build a bat house for our bug-eating friends!

### Did You Hear That?

As night-flying creatures, bats have exceptional hearing. To find prey and navigate, bats use echolocation, emitting high-frequency sounds that bounce off objects and send echoes back to their ears. From the echoes, they can locate prey, judge their size, and determine how fast they're moving, all in a split second. Most bats make calls too high for us to hear, but a few are in our hearing range so keep an ear out.



Back to Bats

# Screen shots

## Wildlife Biologists



Biologists study living things (plant or animals), their habitat, and their interactions with the environment. Wildlife biologists here monitor animals like owls and bats to evaluate the health of the environment and the Lab's effects on it. To become a biologist, you need a degree (or two or three) in the biological sciences—and enjoy being outside!

**Features:** Often wears jeans, T-shirt; eyes/ears finely attuned to observation

**Adult Size:** Variable, size not dependent on gender

**Diet:** Primarily easy-to-carry snacks packed in a backpack

**Habitat:** Prefers to work outdoors, but often required to do office paperwork

▶ [Biology at the Lab](#)

▶ [Why I like biology](#)

 [Back to Home](#)

## Did you Know?

The Lab's wildlife biologists specialize in a variety of animal studies, not just owls and bats, but birds, mammals, plants, sensitive species, and even crawfish in the river. If it lives on Lab property, they study it. What animals or plants would you like to study?

# Screen shots

## Credits

**Owl call recordings:** The Macaulay Library at the Cornell Lab of Ornithology

**Owl photos:** Juan Bahamon, Jared Hobb, Robert McMorran, Brian E. Small, Gerrit Vyn

**Bat photos:** Bat Conservation International, [www.batcon.com](http://www.batcon.com)

J. Scott Altenback, Michael Durham/Minden Pictures, Merlin D. Tuttle

**Eastern Screech Owl photo icon:** "Eastern screech owl - gray morph," Photo by Greg Hume

**Mexican Spotted Owl photos:** Los Alamos National Laboratory (LANL)

**Northern Pygmy Owl information:** National Audubon Society and Owl Research Institute

**App Developers:** Mireya Rodriguez and Elizabeth Starks, AmeriCorps/New Mexico Highlands University

**Biologist photos:** LANL

**Consulting Wildlife Biologists:** Leslie Hansen, Chuck Hathcock, Dave Keller, LANL

**Content Editor:** Caroline Spaeth, LANL

**Technical Advice:** Jesus Mondragon, LANL



**Questions?**