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If you are like me, you might wonder how you used to function without your mobile phone. The ability to look up answers to questions on demand, take photos whenever and wherever, and deposit checks without physically going to a bank are just some of the numerous features I appreciate about this device. More than that though is that in my assessment the mobile phone has revolutionized the way in which we carry out wildlife and botanical fieldwork. This singular device can replace standalone topo maps, soil maps, compasses, GPS units, field guides, audio recording and playback systems, cameras, rulers, measuring tapes, flashlights, datasheets, calculators, manual tally counters, stopwatches, timers, pens and pencils, sunrise and sunset charts, and more.

Below by category are some iPhone apps I've found particularly useful for wildlife and botanical fieldwork. Some of these are available for other platforms (e.g., iPad, Android) as well. Clicking the app logo will take you to the iTunes store, where you can learn more, check pricing, download the app, etc.

**MAPS AND MAPPING**

 <p>Offline Topo Maps TrailBehind</p>	<p>Collect, name, and navigate to and from waypoints on USGS topo maps; export maps.</p>
 <p>Topo Maps Phil Endecott</p>	<p>Similar but higher resolution than above; need to download specific quads before use; can also export files as GPX, KML, or CSV files; show distance rings out from waypoint. The latter feature is helpful if, for example, you wanted to search a 0.5-mile radius around a project site for Swainson's hawk nests.</p>
 <p>Wolf-GIS Wolf-Tek, Inc.</p>	<p>Measure distances between two or more points; draw points, lines, and polygons; import, export, and share ESRI shapefiles. Monthly or annual subscription required.</p>
 <p>Google Earth Google, Inc.</p>	<p>Similar to computer version but no streetview, historic images, measuring, etc. Use to open KML/KMZ files; can email yourself a KMZ, for example, to navigate to a field site.</p>
 <p>Avenza PDF Maps Avenza Systems L...</p>	<p>Show GPS position and compass for navigation, measure distance and areas, records tracks, add photos, and load your own geospatial PDF or JPG via email or Dropbox; some free maps but many require separate purchase.</p>
 <p>GPS Kit - Offline... Garafa, LLC</p>	<p>Create waypoints or tracks, create weather station for waypoints, track routes and time, import or export GPX or KMZ files, share tracks and files real time with other users or on the web.</p>



GIS Kit  
Garafa, LLC

Import ESRI shapefiles or KML/KMZ files; collect points, lines, or polygons in the field or draw manually; enter attribute values in the field at time of collection; create user-defined feature classes (e.g., small mammal burrow, wetland boundary, etc.); geo-tag and tether photos to electronic project file; import and export data wirelessly through email or Dropbox or upload to computer via iTunes.



GIS Pro  
Garafa, LLC

This is my go-to app for navigating and mapping in the field. It is essentially the same as GIS Kit, with some added GIS file sharing capabilities that probably are not worth the extra cost unless those capabilities fulfill a specific need. Both apps are unstable, crashing periodically. A minor annoyance in general, but you can lose data, especially when drawing lines or polygons. The workaround is to add points to your lines regularly; points save automatically whereas lines do not. A fine video tutorial on using the app is available [here](#). On-the-ground accuracy can be improved by using an external GPS receiver such as those offered by [Bad Elf](#). When sub-meter accuracy is required (e.g., for delineating wetlands), I use an [iSXBlue](#) receiver, which is about half the cost of a Trimble unit. If you are using this with a WiFi-only iPad, which lack an internal GPS, you'll need an external GPS receiver.



Map Plus

I have not used this app, but it appears to offer most of the same features as GIS Kit and GIS Pro for substantially less cost. The app itself is free, but in-app purchases are required for full functionality.



Measure Map  
Global DPI, LLC

Measure area of created polygons; save or export as KML, CSV, image (PNG), or PDF and send via email or Dropbox; great for determining approximate areas of field sites or other features.



PeakFinder USA...  
Fabio Soldati

Identify mountain peaks from your position.



Theodolite  
Hunter Research...

Estimate distances with optical rangefinder; measure heights; triangulate the location of a distant object or feature; share map markers via text message; share location info real-time with as many as 20 people; take photos that show coordinates and link to position in Google Maps.



SoilWeb for the i...  
CA Soil Resource...

Get details about the soil underfoot, including soil taxonomy, land classification, hydraulic and erosion ratings, geomorphology, and plants. Great for wetland delineations or assessing the potential for rare plant occurrence.

UTILITIES



Tally Counter  
Pixel Research La...

Add or subtract with satisfying audible clicks; replaces standalone manual counter.



Convert Units  
FREE app - Uni...

Convert value of units of numerous categories; the most useful to me are area and length.



Calculate percent difference, percent increase, percent decrease, and percentages of one number relative to another.

FILE SHARING



Carbonite Mobile  
Carbonite, Inc.

Remotely access any saved file on your computer; must subscribe to Carbonite back up service.



Dropbox  
Dropbox

Share files with others, access stored files, upload or download KML/KMZ files or ESRI shapefiles between Dropbox and mapping app such as GIS Pro; must sign up for an account. This is an essential part of my mobile workflow.

DATA COLLECTION AND MANAGEMENT



Fulcrum  
Spatial Networks, Inc

Create custom data forms and collect data in the field; must sign up for an account.



Mendeley (PDF R...  
Mendeley

Manage your PDF reference library; build, search, read, highlight, and annotate files.



FileMaker Go

Search for and enter data in any created database; requires FileMaker Pro software for your computer. I can access a database I created for Fresno County bird records, for example.



eBird by Cornell...  
Cornell University

Enter bird lists, notes, and photos into eBird while in the field; access those records in the field; email completed bird lists; use eBird tools on computer to search, sort, and graph data. I use this app almost every time I'm in the field.



iNaturalist

Similar to eBird but allows user to document occurrence of any organism, from protozoans and plants to birds and mammals; can participate in online discussion forum.

**FIELD GUIDES**



The Sibley eGuid...  
mydigitalearth.com

The digital version of the popular field guide; includes additional illustrations not in printed guide plus audio files of recorded calls and songs; sort by taxonomic or alphabetic order; narrow search by state, general size and shape (e.g., sandpiper-like, slender bill, robin-size, etc.); compare any two species side by side (a feature I find particularly useful); create lists and export via email; more and higher quality illustrations than iBird Pro.



iBird Pro Guide to...  
Mitch Waite Group

Illustrations and photos plus links to Flickr pages; interesting facts; order and family facts; add your own photos and field notes (which can be exported via email); search by key word, alphabetically by first or last part of name, family, or 4-letter banding code; play calls and songs; more text and probably more user-friendly than Sibley; this is the app I typically recommend for beginning to intermediate birders.



Audubon Insects...  
Green Mountain D...

I also have those for [mushrooms](#), [butterflies](#), [fishes](#), [reptiles and amphibians](#), and [mammals](#). They pale in comparison with Sibley and iBird Pro type apps but are still handy references.



Southern Califor...  
Earthrover Software

Although a guide to the herps of SoCal, it covers most reptile and amphibian species of the San Joaquin Valley; excellent reference; recordings of vocalizations for many species; extensive text; numerous photos of herps and habitats (e.g., 14 for CTS, 32 for Blainville's horned lizard). One of my favorites.



California  
Rattlesnakes

By the same author (Todd Battey) as the SoCal herps guide; provides detailed coverage (including fine range maps) of all seven species of rattlesnakes in the state as well as the three recognized subspecies of western rattlesnake and two subspecies of sidewinder.



iTrack Wildlife  
NatureTracking.com

Photos of skulls, scat, tracks and other sign of 67 species of North American mammals; quite good.

**Jepson eFlora**



California Wildflo...  
Earthrover Software

Not an app, but the entire Jepson Manual is available via your mobile device through this link.

Photos and descriptions with direct links to The Jepson Manual, Jepson Interchange, and CalPhotos; I also have the guide to [Sierra Nevada Wildflowers](#), and guides to wildflowers or plants of regions outside of the San Joaquin Valley (e.g., [Joshua Tree](#), [Death Valley](#), [San Gabriel Mountains](#)).

**WEATHER**

WeatherBug - We...  
Earth Networks, Inc.

Current conditions, forecasts, and radar and satellite layers (including automated time loops) for your current location or areas you select.



AeroWeather Lite  
Lakehorn AG

Current weather at any airport you select, including visibility. Great for flight planning when conducting aerial survey work but also if you want to know about local fog conditions.



LightTracker  
PMLab

Sunrise, sunset, twilight, moonrise, moonset, moon phase, and moon location in sky.