Mobile Apps and Maps
for Catchment Data Capture

This review has been prepared by members of the CaBA support team to help CaBA partnerships identify and use mobile apps and maps which are most suited to capturing data and evidence related to catchment management. We've included weblinks for the apps and maps; a summary of what the app or map can be used to record; the intended audience; details of the platforms and formats; online demonstration videos or tutorials if available; information about customisation and updates; how to access the collected data and links to the developer or provider of the app for more information.

If you are thinking about embarking on app development do contact us as we may be able to put you in touch with someone who is working on the same thing: info@catchmentbasedapproach.org

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PlantTracker

Mobile app and web map for crowd-sourcing information on invasive non-native plant species. Version 2 now released and over 15,000 records submitted since 2012..

Theme: Invasive non-native plant species

Mobile: Available on the App Store   ANDROID APP ON Google play   Coming Soon Download from Windows Store

Web App: planttracker.org.uk

Demo: youtu.be/94mOQbtw5VI

End User Interface: Aimed at general public as well as specialists. Users are now asked for their level of experience before submitting records. Identification guide includes photos, typical habitat, impacts and spread and users can toggle the option to view confusion species . This version now collects additional information on any treatment which has been applied and also allows submission of Himalayan Balsam Rust fungus spread.

Database and Verification: Data are held in iRecord – the Biological Record Centre's system which is build on the Indicia platform. Records are verified by the project partners (SEPA, Environment Agency and Nature Locator) and then published. Anyone can view the map of verified reports.

Data Access: Once verified, data are auto-uploaded to the National Biodiversity Network Gateway data.nbn.org.uk. Users with a registered account can download the data here: data.nbn.org.uk/Datasets/GA001172   (n.b. you need to be logged in to see the Download Dataset link at the bottom of this screen). You can also access information on management and treatment programmes at nonnativespecies.org

Customisation and Updates: The app is not customisable (developer can be contacted below for information on future releases or for bespoke applications.) Future updates and improvements will depend on availability of funding but the app is well used and has already had several updates.

CaBA Partners Also Use: River Recorder and ESRI Collector are used by some groups who prefer to verify records locally. Some Scottish rivers trusts use a system developed by ExeGesIS for accurate mapping of vegetation stands and monitoring management and treatment response.

Developer: naturelocator   natural apptitude   naturelocator.org

In partnership with:

SEPA Scottish Environment Protection Agency   Environment Agency   Scottish Natural Heritage Dualchas Nàdair na h-Alba All of nature for all of Scotland Nàdar air fad airson Alba air fad   BRC Biological Records Centre

riverobstacles

Mobile app and web map for crowd-sourcing information on natural and man-made barriers to fish migration such as weirs, sluices, culverts, waterfalls, fallen trees, etc. .

**Theme:**   Barriers to fish migration and in-river obstacles

Mobile: Available on the App Store   ANDROID APP ON Google play

Web App: www.river-obstacles.org.uk

Demo: youtu.be/94mOQbtw5VI

End User Interface: Aimed at anglers and hill walkers as well as specialists such as river and fisheries trusts. Users are taken through the assessment step-by-step and can record type and size of obstacle, location and photo and also provide an assessment of passability to different fish species if known. ID guides included.
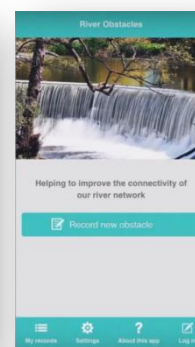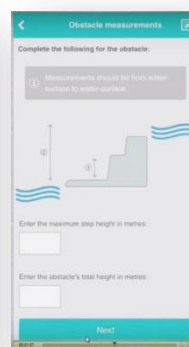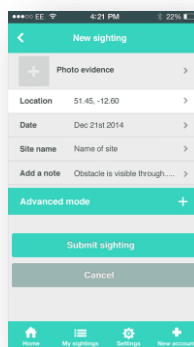
Database and Verification: Data are held in iRecord – the Biological Record Centre's system which is build on Indicia. Records are verified by the project partners (SEPA, Environment Agency and Nature Locator) and manually checked against existing obstacles datasets. Currently the system only allows submission of new records not editing of existing ones so some work is required to cross-reference datasets.

Data Access: Organisations who wish to download the information can request an account and are able to download records from the web app.

Customisation and Updates: The app is not customisable (developer can be contacted below for information on future releases or for bespoke applications.) Future updates and improvements will depend on availability of funding.

CaBA Partners Also Use: ESRI Collector and simple PDF or paper maps have been used in the past but the app has only recently been released so is yet to become widely adopted and tested.

Developer: naturelocator   natural apptitude   naturelocator.org

In partnership with:

SEPA Scottish Environment Protection Agency   Environment Agency   RAFTS

*aqua*invaders

Mobile app and web map for reporting and tracking invasive non-native aquatic species.

Theme: Invasive non-native aquatic species

Mobile:

Web App: www.brc.ac.uk/aquainvaders

Demo: youtu.be/94mOQbtw5VI

End User Interface: Aimed at anglers, divers and recreational water users as well as specialists. Identification guide includes photos, typical habitat, spread, and confusion species. The app covers 12 species of fish, 5 species of crayfish, 4 species of amphibian as well as Killer Shrimp, Zebra Mussel and Mink.

Database and Verification: Data are held in iRecord – the Biological Record Centre's system which is build on the Indicia platform. Records are verified by the project partners before publication. Anyone can browse the published records via the website. Currently the system only allows submission of new records not editing of existing ones so some work is required to cross-reference datasets.

Data Access: Once verified, data are auto-uploaded to the National Biodiversity Network Gateway data.nbn.org.uk. Users with a registered account can access the data here: data.nbn.org.uk/Datasets/GA001353 (n.b. you need to be logged in to see the Download Dataset link at the bottom of this screen).

Customisation and Updates: The app is not customisable but the developer can be contacted below for information on future releases or for bespoke applications. Low levels of usage so the app hasn't yet been updated.

CaBA Partners Also Use: No known alternatives for aquatic invasives.

Developer: naturelocator   natural apptitude   naturelocator.org

In partnership with:

SEPA Scottish Environment Protection Agency

Environment Agency

Scottish Natural Heritage Dualchas Nàdair na h-Alba All of nature for all of Scotland Nàdar air fad airson Alba air fad

BRC Biological Records Centre

BSAC Dive with friends

FreshWaterWatch

Mobile app for the global EarthWatch programme collecting fresh water quality
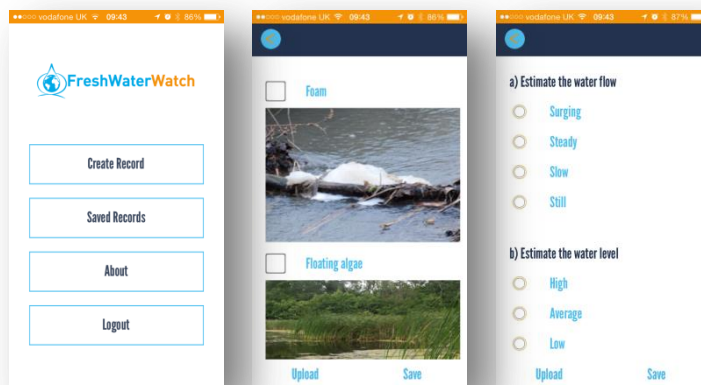
Theme: Water quality

Mobile:

Web App: freshwaterwatch.thewaterhub.org

Demo: youtu.be/IgVIw5ISxGc

End User Interface:

Aimed at a global audience, users sign up on the web app and are taken through a training video, followed by a quiz to test their understanding before they can order water quality testing equipment. The app asks users to login and then enter information on waterbody type, location, photo, landuse, pollution, flow regime, water colour and water quality readings taken with the sampling kit (Nitrate, rPhosphate and Turbidity).

Database and Verification: Data are held in an online system which allows users to view their results and those from other users. FreshWaterWatch have a network of scientific partners who provide feedback on what the water quality results mean and ask for double-checking if anything looks strange. The website allows users to blog about their results and others, and the whole programme encourages users to engage with each other and learn what their results mean in a wider regional, national and global context.

Data Access: There are a number of scientists who have partnered with EarthWatch to access the FreshWaterWatch data for their own research programmes and EarthWatch are keen to widen this network. To discuss your requirements for using the datasets, contact EarthWatch

Customisation and Updates: The app as it is published is not user-customisable, but EarthWatch and Wild Knowledge are keen to work with anyone who would like to develop a bespoke local programme on the FreshWaterWatch platform.

CaBA Partners Also Use: ESRI Collector, WiseCAM.

Developers: wildknowledge.co.uk   eu.earthwatch.org

Supported by:

Collector for ArcGIS and ArcGIS Online

Customisable platform for mobile and web data capture which can be integrated with ArcGIS Desktop. Ideal for staff or trusted volunteer networks to collect and report data, but not ideally suited to crowd-sourcing because the app must be connected to an ESRI account. Requires an ESRI ArcGIS Desktop license.

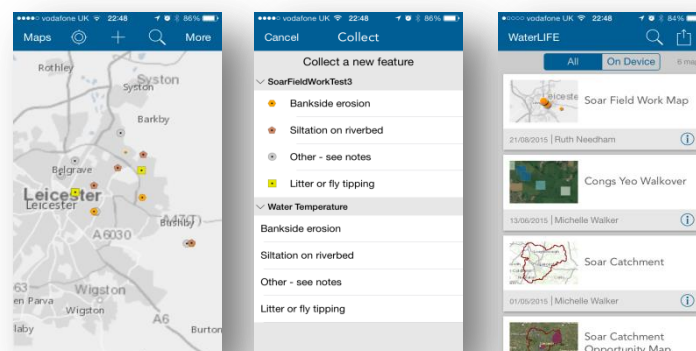**Theme:**   Can collect any type of spatial data and photos

Mobile:

Web App: www.arcgis.com

Demo: youtu.be/UUcJjPzE7mU

End User Interface: The Collector App can be downloaded for free but must be connected to an ArcGIS Online account in order to capture and upload data. Therefore this app is best suited for use with networks of trusted volunteers or staff who you can share your ESRI login credentials with.

Database and Verification: Data are stored in the ESRI cloud (or you can upload to your own ArcGIS Server if you have one). An ArcGIS Online Subscription is required – this is available free with an ArcGIS Desktop Non-Profit license (which currently costs around £100 +vat per year).

Data Access: It is easy to share mapped information with partners via ArcGIS Online as an interactive map or a GIS file which can be downloaded.

Customisation and Updates: Maps and data collection forms are entirely customisable via ArcGIS Desktop or ArcGIS Online and online training and videos are available. App is published by ESRI and is maintained and regularly updated.

CaBA Partners Also Use: Snap2Map can also be used to publish photos to an ESRI map

Developer: www.esri.com/software/arcgis/collector-for-arcgis

Used by:

Snap2Map and ArcGIS Online

Simple app for publishing photos taken on smart phone as an ESRI Story Map. Ideal for staff or trusted volunteer networks to collect and share photos on a map, but not ideally suited to crowd-sourcing because the app must be connected to an ESRI account. Requires an ESRI ArcGIS Online subscription.

Theme: Publishing photos on a map
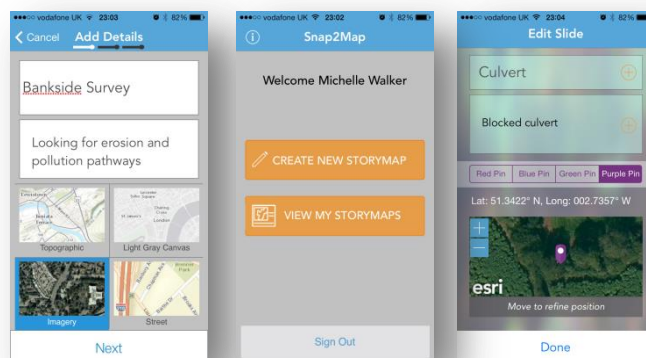
Mobile: Available on the App Store   ANDROID APP ON Google play

Web App: www.arcgis.com

Tutorial: youtu.be/UUcJjPzE7mU

Example output: http://arcg.is/1TjfvxM

End User Interface: The Snap2Map App can be downloaded for free but must be connected to an ArcGIS Online account in order to capture and upload photos to a Story Map. Therefore this app is best suited for use with networks of trusted volunteers or staff who you can share your ESRI login credentials with.

Database and Verification: Data are stored in the ESRI cloud (or you can upload to your own ArcGIS Server if you have one). An ArcGIS Online Subscription is required – this is available free with an ArcGIS Desktop Non-Profit license (which currently costs around £100 +vat per year).

Data Access: It is easy to share mapped information with partners via ArcGIS Online as an interactive map or a GIS file which can be downloaded.

Customisation and Updates: Maps and data collection forms are entirely customisable via ArcGIS Desktop or ArcGIS Online and online training and videos are available. App is published by ESRI and is maintained and regularly updated.

CaBA Partners Also Use: ESRI Collector app can also be used to publish photos to a map. WildMap from WildKnowledge can be used to create a map-based audio-tour with photos, text and interactive content.

Developer: esri   www.esri.com/software/arcgis/collector-for-arcgis

Used by:

THE RIVERS TRUST

trent rivers trust
Merged with the OnTrent Partnership

Eden Rivers Trust

A set of user-customisable apps which can be used to support citizen science, education and public engagement. The apps include WildKey (for producing decision tree ID guides) and WildForm (for data gathering). In addition, WildMap and WildImage are customisable interactive multi-media visitor guides. Below we focus on WildForms but you can find out about the other apps at the Wild Knowledge website. Also see the FreshWaterWatch app review for an example of a bespoke system developed on the WildForms platform.

Theme: Customisable to collect and show any kind of spatial data

Mobile:

Web App: wildknowledge.co.uk

Demo: youtu.be/IgVIw5ISxGc

End User Interface: The WildForm app can be downloaded for free and must be connected to a WildKnowledge account in order to upload data. Administrators can test the forms before publication to ensure that the labels and functions work well. Forms with up to three fields can be published for free.

Database and Verification: Data are stored in an online database which is accessible to the administrator (publisher) of the form to allow data verification.

Data Access: Data can be downloaded as CSV file and captured photos can be automatically uploaded to a Flickr account. Data can also be mapped within the web app using Google Maps.

Customisation and Updates: The free account allows you to publish forms with up to three customised fields. For additional fields you need a subscription account (contact WildKnowledge for pricing). The developer can also create fully customised and branded apps and/or websites.
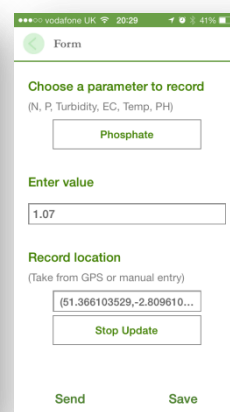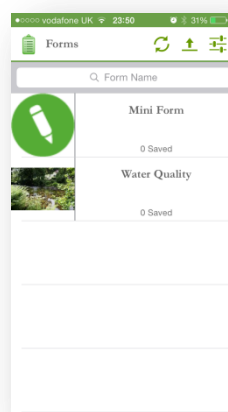
CaBA Partners Also Use: ESRI Collector and Snap2Map.

Developer: wildknowledge.co.uk

Used by:

EpiCollect+ RiverEYE

RiverEYE is a trial application by Sarah Taigel (University of East Anglia) built on the open source EpiCollect+ platform by Imperial College. RiverEYE has been trialled by River Waveney Trust volunteers to collect information on different issues within the Waveney catchment.

Theme: River Issues (EpiCollect is customisable to collect and show any kind of spatial data)

Mobile: Available on the App Store   ANDROID APP ON Google play

Web App: epicollectserver.appspot.com

Demo: youtu.be/yzLvgA1A1ms

Example Output:

http://plus.epicollect.net/RiverEYE2/RiverEYEReport

End User Interface: The EpiCollect+ app can be downloaded for free and users then search for a project (e.g. RiverEYE2) in order to use the customised form to upload data. The project administrator develops the form using the epicollect web interface. Forms can be published for free.

Database and Verification: Data are stored in an online database which is accessible to the administrator (publisher) of the form to allow data verification.

Data Access: Data can be downloaded as CSV file or displayed on a map within the web interface. EpiCollect can also make data available as web services (REST) for integration with other web mapping apps.

Customisation and Updates: The EpiCollect platform is open source, which means that anyone can use and adapt the code. To use or develop the RiverEYE project on the app, contact Sarah Taigel.

CaBA Partners Also Use: ESRI Collector and Snap2Map for recording river issues.

Developer: Imperial College London   www.epicollect.net   UEA University of East Anglia   futurelandscapes.wordpress.com

Used by: Wensum Alliance   RIVER WAVENEY TRUST
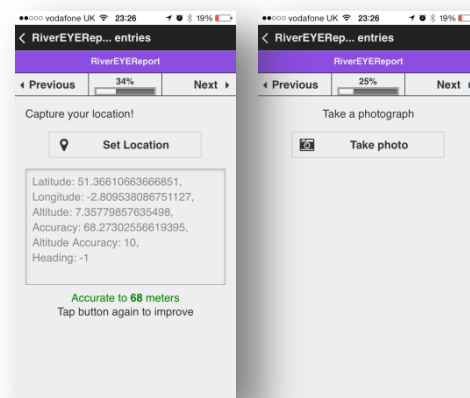
Fieldtrip GB

FieldTrip GB is a mobile mapping and data capture app designed to support educational field trips and citizen science projects. The app has been developed by EDINA at the University of Edinburgh..

Theme: Entirely user customisable

Mobile:

Web App: fieldtripgb.edina.ac.uk/authoring/

End User Interface:

The FieldTrip GB app uses open source data to provide a detailed basemap (including rights of way) which can be downloaded to the app for offline use. Users can capture images, notes, audio recordings and GPS trails straight away without even connecting to a database. Users are required to login via a Dropbox account in order to upload data, and access bespoke forms for data entry.

Database and Verification:

Data are stored in Dropbox so users require a Dropbox account (available free of charge). The authoring website allows records to be reviewed, downloaded and managed.

Data Access:

Data can be downloaded as CSV, KML or GeoJSON formats, or displayed on a table or map within the web interface.

Customisation and Updates: Contact EDINA

CaBA Partners Also Use: EpiCollect, ESRI Collector and Snap2Map

Developer: EDINA   edina.ac.uk/

Project partners:

Wireless Sensing Mobile app and web map for gathering water quality data, primarily from remote wireless sensors but also manual measurements.

Theme: Water Quality and Physical Chemistry

Mobile:

Web App: www.wisecam.co.uk

End User Interface: Aimed at rivers trusts and universities who are collecting water quality and physical chemistry data on a regular basis. The app was primarily developed to collect wireless sensor data but users can also choose to input manual water quality readings and download these from the website afterwards. Form has been designed to collect water quality (NO_3-, PO_4^{3}-, NH_4^+, turbidity) and physical (EC, T and P) measurements.
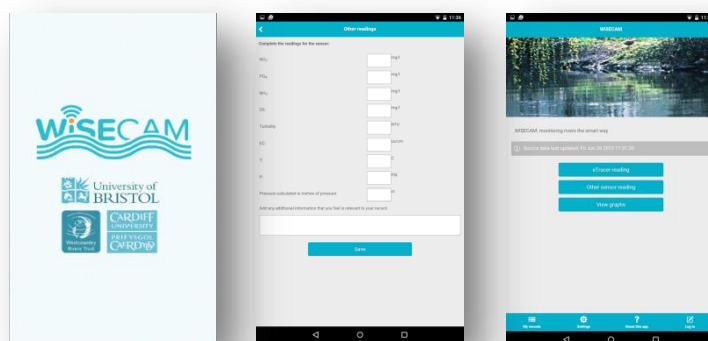
Database and Verification: Data are held in an online database hosted by the developer and currently accessible by the University of Cardiff, University of Bristol and Westcountry Rivers Trust.

Data Access: Organisations who wish to download the information can request an account and are able to download records from the website.

Customisation and Updates: The system is currently being trialled and developed as part of a wider wireless sensing research programme. Future developments may include an online map or iPhone version - contact the developer for more information.

CaBA Partners Also Use: ESRI Collector and FreshWaterWatch.

Developer: naturelocator.org

In partnership with:

Cartographer

Web-based data management system for entering, managing and displaying environmental data. Cartographer was developed to manage data for the Urban River Survey and has now been adapted to allow Thames21's Thames River Watch volunteers to enter water quality data and query the results.

Theme: Physical River Quality and Water Quality, but could be adapted to suit any kind of survey

Web App: https://cartographer.io/

Demo: youtu.be/4ZYCtEctvJ4

Example Output: http://www.thames21.org.uk/thames-river-watch-water-quality

http://urbanriversurvey.org/

End User Interface: Cartographer is an integrated system for crowd sourcing data, with web entry forms for volunteers to submit records, a management interface for verifying and analysing data and managing volunteers, and a public map interface to share the results. There is no mobile app but volunteers can enter data via the web form on a smart phone web browser provided they have an internet connection.
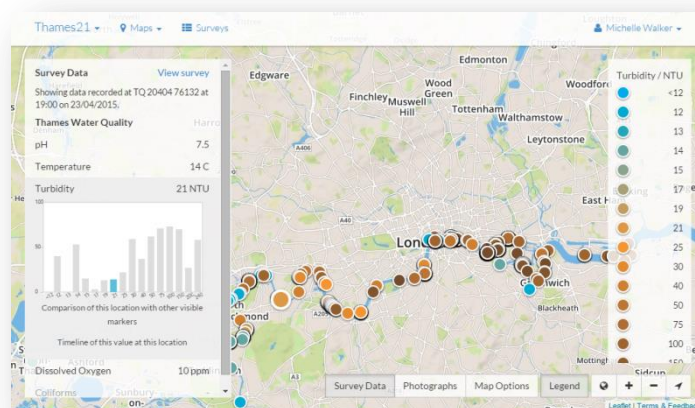
Database and Verification: Data are held in an online database hosted by the developer and accessible by the partner organisations and their volunteer surveyors. Verification is undertaken by the partner organisations.

Data Access: Partner organisations and their volunteers are able to download records from the website. Anyone can view the data via the output web maps.

Customisation and Updates: The system would need customisation for rolling out to other partners – contact the developer for more information about options and costs.

CaBA Partners Also Use: ArcGIS Online and FreshWaterWatch.

Developer: untyped   untyped.com

Used by:

THAMES21   Queen Mary University of London   THE ROYAL PARKS FOUNDATION   Environment Agency

River Recorder

App and web based data management system developed by Norfolk Rivers Trust but customisable for any other catchment.

Theme: River issues, wildlife, invasive species

Mobile: Available on the App Store   ANDROID APP ON Google play

Web App: norfolkriverstrustapp.org

End User Interface:

Developed by Norfolk Rivers Trust for use by their volunteers to report wildlife sightings and river issues such as diffuse or point source pollution and invasive species. Users first select a username and enter an email address to register. Then they select a named river then a type of event and sub-category. There are ID guides for species and issues, and users can upload a photo.

Database and Verification:

Data are held in an online database hosted by the developer and currently accessible by Norfolk Rivers Trust who then verify the data. This web interface could be customised to allow access to different organisations.

Data Access:

Anyone can view the data on the website but only the administrator can download the data. Invasive species data are automatically uploaded to the NBN Gateway.

Customisation and Updates:

The system is being offered to others to develop and use at cost – contact Norfolk Rivers Trust for more information.

CaBA Partners Also Use: ESRI Collector, PlantTracker, AquaInvaders, FreshWaterWatch.

Developer: NORFOLK RIVERS TRUST   www.norfolkriverstrust.org

In partnership with:

Environment Agency   NBN National Biodiversity Network

Riverfly Partnership WebMap

Web-based data management system for entering, managing and displaying Riverfly Partnership invertebrate survey results.

Theme: Invertebrate monitoring

Web App: www.riverflies.org/riverflies-gis-home

End User Interface: The Riverfly Partnership system is accessible to volunteers registered with the scheme. Volunteers can enter their latest survey results and view them alongside other national results. Environment Agency staff can set and adjust trigger levels for survey sites and partner organisations can add new users and sites.

Database and Verification:

Data are held in an online database hosted by the developer and accessible by the partner organisations and their volunteer surveyors. Verification is undertaken by the partner organisations.

Data Access:

Partner organisations and their volunteers are able to download records from the website. Anyone can view the data via the output web maps.

Customisation and Updates:

The system will be maintained and updated by the Riverfly Partnership.

CaBA Partners Also Use: Natural Access, Google Maps.

Developer: www.fba.org.uk

Project partners:

Research Data Management

Web-based data management system for entering, managing and displaying environmental data. Natural Access web platform is a standardised framework for research data management that has been customised for Action for the River Kennet (ARK) to manage riverfly survey data.

Theme: Invertebrate monitoring (but customisable to any data theme)

Web App: www.naturalaccess.org.uk

End User Interface: The ARK Research Data Management System is accessible to volunteers registered with Natural Access. Volunteers can enter their latest survey results and data can then be graphically viewed on-line.

Database and Verification:

Data are held in an online database hosted by the developer and are

accessible by approved users. Verification is undertaken by approved validators. A wide range of administration functions are made available to ARK to manage the system and research data.

Data Access:

Approved users are able to download records from the website. Data are also available as an offline Excel workbook, updated regularly.
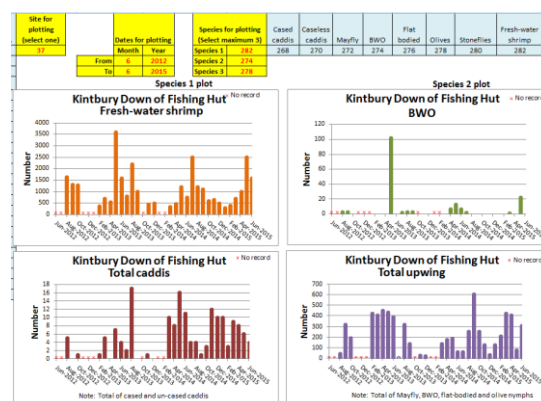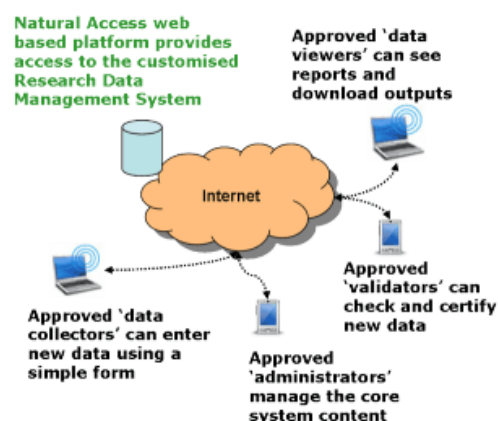
Customisation and Updates:

Contact the developer for more information.

CaBA Partners Also Use: Riverfly Partnership WebMap, Google Maps.

Developer: Natural Access www.naturalaccess.org.uk

Used by:

Others to Consider….

PDF Maps – Wyre Rivers Trust demonstrate how they use the annotation feature of Adobe to annotate PDF maps as a simple solution to capturing line and polygon data in the field: https://youtu.be/C48Br8HRrlI

Indicia / iRecord – Open source biological recording toolkit developed by OPAL and the Biological Records Centre http://www.indicia.org.uk/

Fieldscope – national geographic Citizen Science Mapping toolkit

http://education.nationalgeographic.com/programs/fieldscope/

Defra Field Toolkit – developed by ADAS and CEH for ecological targeting of agricultural diffuse pollution mitigation measures, including a mobile mapping and data capture element. Contact ADAS for more information.

Hard Copy Identification Guides

Opal (Open Air Laboratory)   http://www.opalexplorenature.org/

Field Studies Council   http://www.field-studies-council.org/publications.aspx

GateKeeper   http://www.gatekeeperel.co.uk/