



Sentinel[®] GIS

Surveillance Quick Start Guide

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Table of Contents

About Sentinel GIS	1
Sentinel GIS Modules	1
Larviciding.....	1
Adulticiding.....	1
Surveillance	1
Service Request.....	2
System Components, Hardware and Software Requirements, Installation Instructions	2
Configure DataLink GIS Options.....	6
Surveillance Application Configuration Utility.....	7
Create a Surveillance Map for the Handhelds	7
Extract Data	7
Synchronize (Send Files).....	7
Mobile Operation.....	7
Synchronize (Receive Files/Merge/Send Files)	7
Surveillance Tools.....	7
Analysis	7
DataLink GIS Options	9
Run and Close Options.....	9
Transfer Options	9
Path Options	10
Automated Processes Options	11
Devices	12
Set Password.....	14
Surveillance Application Configuration Utility.....	14
Agency	15
General	16
Pick Lists.....	17
Pick List Types.....	18
Sort Pick Lists/Save Sort.....	18
Laboratories	19
Mosquitoes.....	20
Chickens	21

Surveillance Toolbar Options.....	22
Update Symbology.....	22
Set Zone Layer	23
Identify Layers.....	23
Sentinel Chicken Flocks.....	24
Create Flock Sites.....	24
Edit Flocks	25
Create Flocks.....	26
Assign Chickens to Flocks	27
Create a Map in ArcMap	28
Layer Properties.....	30
Symbology and Labels.....	30
Display Scale	31
Visible Fields.....	32
Extract Data	32
Receive Files	35
Merge.....	35
Send Files.....	36
User Interface	37
Main Toolbar	37
Surveillance Toolbar	39
Creating New Features with GPS or Pen.....	41
Mosquito Trap Sites	41
Landing Count Sites.....	41
Dead Bird Location	42
Editing Site Details.....	42
Creating New Surveys	42
Mosquito Trap Surveys	43
Sentinel Chicken Flock Surveys.....	44
Landing Count Surveys.....	44
Accessing Survey History	44
Mosquito Trap Surveys	45
Sentinel Chicken Flock Surveys.....	45
Landing Count Surveys.....	46

Using the Task List/Find Utility	46
Working with Service Requests	47
View Service Requests	47
Sort Requests	48
View Details	48
Zoom To.....	48
Place Service Request.....	49
Complete Service Request	50
Mosquitoes.....	51
Create/Edit/Delete Surveys.....	52
Click New Survey to enter trap set/retrieve details on the desktop. Select the trap site to create the survey for, then click OK.....	52
Enter Speciation/Abundance Data.....	53
Create/Edit Mosquito Pools	54
Enter Lab Results	55
Closing Surveys.....	57
Chickens	58
Process Samples.....	58
Send to Lab.....	59
Enter Lab Results	59
Dead Birds	61
Add Samples.....	61
Send to Lab.....	62
Enter Lab Results	62
Larval Samples	64
Edit/Delete Samples	64
Enter Speciation and Abundance Data.....	65
Close Sample.....	65
Create New Features.....	66
Edit Existing Features	69
Edit Attributes.....	69
Edit Feature Locations	70
Generate Map Data	72
Specify Selection Criteria for All.....	72
Mosquitoes.....	72

Abundance	72
Disease	72
Chickens	73
Dead Birds	73
Species	73
Disease	73
Landing Counts	73
Mosquito Larvae	73
Create Reports	74
Mosquitoes	74
Abundance Tabular	74
Abundance Zone	74
Disease Detail	74
Disease Summary	74
Larvae Abundance Tabular	74
Larvae Abundance Zone	74
Report Criteria	75
Chickens	76
Disease Detail	76
Disease Summary	76
Dead Birds	77
Abundance Summary	77
Disease Detail	77
Disease Summary	77
Landing Counts	78
Landing Count Detail	78
Landing Count Summary	78

Introduction

About Sentinel GIS

Sentinel GIS is your complete solution for recording and managing data critical to controlling mosquitoes. This easy-to-use package features mobile GIS solutions for mosquito control, automated synchronization between the desktop GIS and the mobile GIS, and supervisory tools making it easy for supervisors to customize and maintain their workflow processes. Applications are based on industry standard Esri ArcGIS and ArcPad software yet they are fully customizable for your specific needs.

Sentinel GIS offers four application modules. Pick and choose the modules that fit your mosquito control needs. Modules can be added onto the package when you are ready to implement new control methods.

Sentinel GIS Modules

Larviciding

To control mosquito populations, field inspectors first locate standing water bodies that serve as mosquito breeding grounds and apply control agents if mosquito larvae or pupae are present. Field inspectors prepare for field work by synchronizing their handheld device with a desktop computer using DataLink GIS. In the field, they navigate to the water bodies needing inspection. Once at the site, the crew maps the site with GPS, records an inspection, or views a past inspection. Inspectors can record the application of multiple biological agents along and view past treatment history. Sentinel GIS helps manage the inspection schedule on a per-site basis.

Adulticiding

In Adulticiding, fog-spraying is used to kill adult mosquitoes. The Adulticiding application manages spraying activities to efficiently schedule personnel and equipment while minimizing chemical usage and costs. Supervisors prepare for spraying activities by downloading user-specific application settings, accompanying maps, and GIS layers into their handheld device. In the field, the sprayer operator logs in to the application, which then records spray activities, including location, time, chemical type and amount. Spray areas can be viewed on a map. Back at the office, supervisors automatically transfer, merge, and update the GIS. ArcGIS provides desktop tools for map display and query including the creation of fog areas. Supervisor tools are available for managing personnel, equipment details, and chemicals used. Pre-defined report templates quickly generate required spray activity reports.

Surveillance

Collecting data on adult mosquitoes and other disease vectors such as dead birds and sentinel chickens facilitates the formulation of an effective control plan. Surveillance methods include:

1. Monitoring mosquito population distribution and abundance over time via traps and landing counts
2. Testing trapped mosquitoes for diseases affecting human or animals
3. Testing sentinel chickens or dead wild birds for diseases

Using Sentinel GIS Surveillance, supervisors prepare for field activities by downloading GIS data for trap locations, mosquito species, sentinel chicken flock information, data collection forms, and maps into the handheld device. In the field, the technician navigates to or maps trap sites, records trap site surveys, conducts sentinel chicken or dead wild bird surveys, and records landing count rates. This information is automatically transferred into the GIS back at the office. ArcGIS provides desktop GIS tools for map display and query. Supervisor tools enable management of trap information, laboratory surveys, mosquito species, sentinel chicken flock and dead bird details, and laboratory test results. Predefined templates quickly generate a wide variety of map layers and reports for analysis, including mosquito abundance, disease details, and mosquito disease distribution.

Service Request

The Service Request includes a web-based desktop application for creating, tracking and reporting incoming service requests about mosquito or other customer service activity. Information logged includes location, complaints about biting or swarming mosquitoes, or requests for mosquito control. Analyzing this information, the agency can identify the problem sources, apply treatments efficiently and reduce the amount of pesticide used. Supervisors prepare for field activities by downloading service request locations, assigned requests, and accompanying maps into the handheld device. In the field, the inspector maps the service request location, and updates service request details. Back at the office, field data are merged into ArcGIS. Supervisor tools are available to prioritize service requests, establish work zones, and identify trends and problem areas. Predefined report templates summarize service requests over a specified time period.

System Components, Hardware and Software Requirements, Installation Instructions

More details are provided in the Sentinel GIS Installation Guide, which provides complete instructions on installation and configuration for each Sentinel module. System components and hardware and software requirements for installation are also discussed in detail.

Finding Additional Information

Help and User Guides

Sentinel GIS help is available in the Quick Start Guide (Program Files\ElecData\Mosquito\[ModuleName]\ in PDF format) and in the Quick Reference Guide. The Quick Start Guide provides operating instructions for the Sentinel GIS ArcMap toolbars, including setup and configuration, map queries and data generation, and report generation. It also includes instructions for DataLink GIS configuration and operation. Instructions for handheld software operation are also provided.

ArcGIS Desktop Help is available through the Help menu in ArcMap.

ArcPad help is available in the ArcPad User Guide (Program Files\ArcPad x.x\Help\), but it applies to the standard ArcPad interface.

Online self-help resources for handheld devices, including documentation, operating system or firmware updates, support notes and bulletins, white papers, and FAQ's, can be accessed on each manufacturer's Website. For Trimble handheld devices, go to www.trimble.com/support and click the link for your model.

For Juniper Systems handheld devices, go to www.junipersys.com/support and click the link for your model.

Training

Sentinel GIS training is available from Frontier Precision. Remote assistance, including product orientation and informal task-oriented training, is included in technical assistance. Formal instructor-led on-site training is also available in 1-, 2-, or 3-day formats. For information and pricing, please contact Frontier Precision at (208) 324-8006.

ArcPad GPS Training (including Trimble Certified Mobile GIS Training) is also available from Frontier Precision. ArcPad training can be provided for any handheld device with any GPS receiver. Trimble Certified training can be provided for ArcPad with Positions with any Trimble GPS hardware. If you would like to use standard ArcPad for other data collection projects, please contact us for a training schedule or for on-site training options.

Esri Virtual Campus and instructor-led training is available for ArcGIS Desktop. See <http://training.Esri.com/gateway/index.cfm> for help deciding which courses best suit your needs or the needs of your users.

Technical Assistance

Sentinel Support

High-priority unlimited toll-free phone and email support is available from Frontier Precision. If FieldSeeker GIS software maintenance is current, please use the contact information below to contact support. This technical support covers the mobile devices, server setup, and FieldSeeker GIS software configuration and use.

To contact Technical Support:

Frontier Precision
(208) 324-8006, 8 AM – 5 PM MTN
support@frontierprecision.com

When contacting support, please supply your contact details (name, company, email, phone) and the nature of your inquiry. This helps support to locate your information and history more quickly

Please note that high-priority technical support does not include software maintenance for Esri software, or hardware warranty for Trimble GPS equipment or Juniper Systems hardware. Esri ArcGIS software has Support and Maintenance extensions available separately from Esri; see www.esri.com/support for more details. Trimble GPS equipment comes with 1 year hardware warranty standard, which can be extended two additional years. Please contact Frontier Precision for FieldSeeker GIS software maintenance renewal or hardware warranty extension, and Esri for ArcGIS software maintenance.

If you have not purchased software maintenance, product updates and technical support will not be available.

Handheld and GPS Support

Technical support for your mobile device is available from the retail outlet where it was purchased, the equipment manufacturer, the warranty service company (e.g. SquareTrade, Asurion), or Frontier Precision, depending on where you purchased it.

Esri Software Support

ArcGIS Desktop and ArcPad software support as it relates to the use of Sentinel GIS is obtained through Electronic Data Solutions. Technical assistance for issues, bugs, or defects with standard ArcGIS or ArcPad software is obtained through Esri Support. Technical assistance is included in annual software maintenance. Even if maintenance is not current, self-help resources are also available from ESRI's Website.

Live Support from ESRI:

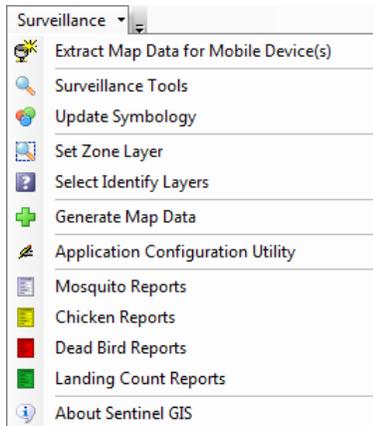
(888)377-4575 toll-free

Online request: <http://support.Esri.com/index.cfm?fa=homepage.policies.gateway>

Self-help resources, including patches and service packs, user discussion forums, documentation, support notes and white papers:

www.Esri.com/support

Surveillance Toolbar



The Surveillance toolbar is available in ArcMap. If it is not visible, turn it on by selecting **Customize > Toolbars**.

The toolbar contains the following items:

Extract Map Data for Mobile Devices(s). Choose layers to extract for mobile devices. All map data and historical survey data is extracted and prepared for sending to the handhelds using DataLink GIS.

Surveillance Tools. Enter mosquito trap speciation and abundance data. Submit lab samples for mosquito pools, chicken blood samples, and dead bird samples. Enter lab results. Configure sentinel chicken flocks.

Update Symbology. Update symbology for 'next action' for mosquito trap sites and chicken flock sites.

Set Zone Layer. Select the layer in the current map Table of Contents (TOC) that represents the zone layer. This is subsequently used in site details for all site types.

Select Identify Layers. Select which layers in the current map should be identifiable in ArcPad. If the map contains many layers, you may only want to view information for some of them when using the Identify tool in ArcPad on the mobile device.

Generate Map Data. Analysis tools for generating spatial abundance and disease data for mosquito trap results, dead birds, chicken blood samples, and landing counts.

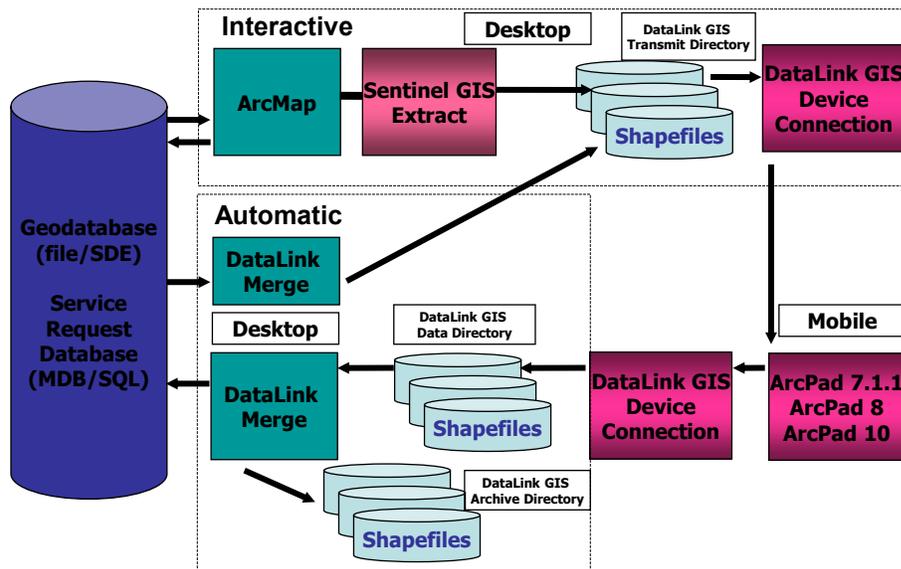
Application Configuration Utility. Set up configuration options for the Surveillance application, including pick lists, GPS tracklog interval, and survey history filters.

Reports. Reports for disease and abundance results, based on user-defined criteria such as date range, all/selected sites, and other parameters specific to the report.

About Sentinel GIS. Obtain version and help information.

Workflow

Sentinel GIS Data Flow



The diagram above illustrates the Sentinel GIS data flow. This will assist you in understanding a typical workflow.

Typical Sentinel GIS workflow involves initial setup tasks, regular data synchronization, and analysis including reports and map data generation.

Setup tasks - including configuring DataLink GIS and the Surveillance configuration utility, creating a Surveillance map, and extracting data for the mobile devices - generally are performed once, and then only periodically adjusted as needed.

Synchronization tasks - including receiving data from mobile devices, merging data to the database, and sending data back to the mobile devices - usually occur on a regular basis.

Analysis activities occur whenever needed.

Here is a summary of the typical workflow steps. Each of these items will be covered in more detail in upcoming sections of this guide.

Configure DataLink GIS Options

DataLink GIS manages the data flow between handhelds and desktop PC's, as well as automatic data transactions with the Sentinel GIS geodatabase. Processed field data is archived.

Configuration includes setting file paths, auto-run options, and when to merge field data. Handheld configuration in DataLink GIS includes assigning a handheld ID and transfer set(s), such as Surveillance Data, Larviciding Data, and Service Request Data.

Surveillance Application Configuration Utility

The configuration utility is used to set up pick lists such as employees, trap types, and bird species; general options such as flock sample interval, GPS tracklog interval, and survey history filters; sentinel flocks and chickens, which mosquito species to use for speciation and pooling, and other items.

Create a Surveillance Map for the Handhelds

Create an ArcMap MXD file that will be used as the basis for map appearance in ArcPad on the handhelds. Configuring options such as display scales, easy-to-read symbology and labels, and field visibility, will optimize ArcPad performance and user experience.

Extract Data

Choose which layers to extract for the mobile device.

Synchronize (Send Files)

Connect each handheld to the desktop PC and send files through DataLink GIS.

Mobile Operation

Create trap sites, landing count sites, and dead bird locations using GPS or the pen. Enter survey information for mosquito traps, sentinel chicken flocks, and landing counts. View survey history. Search for tasks to be completed.

Synchronize (Receive Files/Merge/Send Files)

Connect each handheld to the desktop PC and receive files through DataLink GIS. Data is merged to the geodatabase immediately, or at a time specified during configuration. Once all data is merged, data is sent back to each handheld.

Surveillance Tools

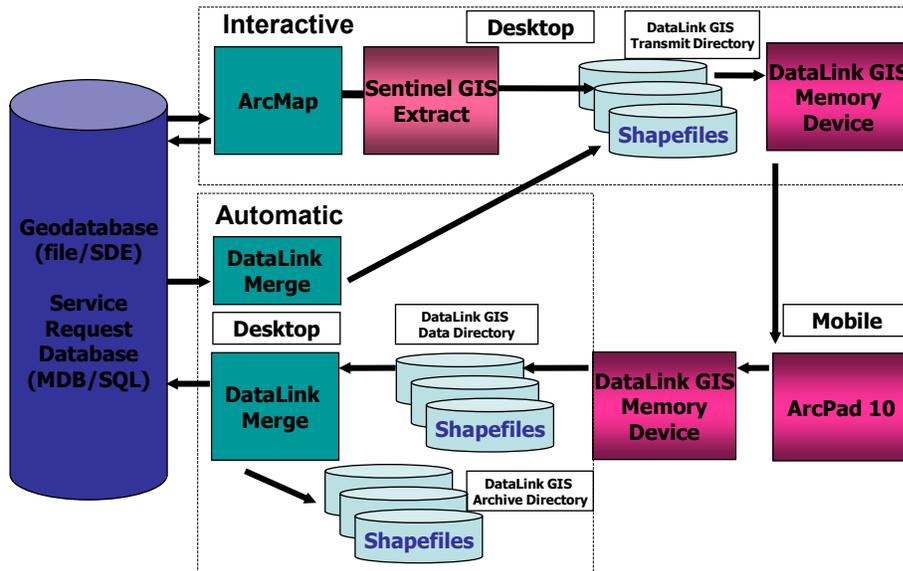
Enter speciation and abundance data for mosquito trap surveys. Send pools, blood samples, or dead bird samples to labs for testing. Enter lab results.

Analysis

Create map layers to visualize distribution and abundance of mosquitoes or disease occurrences based on user-defined settings.

Workflow – Memory Card Device

Sentinel GIS Data Flow



The diagram above illustrates the Sentinel GIS data flow with a Memory Card device. This is intended to support data collection using a Windows laptop, where users can take advantage of increased screen size, processor speed, RAM, and data storage. In most respects the workflow is the same, but there are some important differences.

- DataLink GIS sends ArcPad field data and Sentinel GIS program files, applets, and configuration files to a memory card device on a configured drive letter. This means that the PC with DataLink GIS requires a card reader (if using SD cards).
- The memory card device is removed from the card reader and inserted into the Windows laptop.
- The Sentinel GIS Mobile Application Manager is run from the memory card device (an application shortcut should be created on the desktop of the Windows laptop).
- Sentinel GIS data is collected
- Sentinel GIS is shut down
- The memory card device is removed from the Windows laptop and inserted into the card reader
- DataLink GIS receives data from the memory card device and processes it

Configuration

A small amount of configuration is required prior to using Surveillance. It's easy to adapt the program to your district or organization. When staff, products, or priorities change, the program changes with you.

DataLink GIS Options

DataLink GIS automatically synchronizes data between handheld devices and your PC. Map data, pick lists, and surveys will automatically be sent to any mobile device that is recognized by DataLink GIS. Any data collected in the field will automatically be downloaded and processed when a recognized mobile device is connected.

Run and Close Options



1. Click Options > Run/Close. The top two options are checked by default.
 - a. Automatically run DataLink GIS on mobile device USB connection (*Note: DataLink GIS does not automatically run when a memory card is plugged in*)
 - b. Bring program to front on mobile device USB connection
 - c. Show confirmation prompt before closing program
2. Press OK to save your changes.

Transfer Options



1. Click Options > Transfer. All options are checked by default.
 - a. Automatically receive data files
 - b. Automatically send files

- c. Archive files on mobile device after successful reception. Files will be retained for 7 days.
 - d. Clear data mobile device after successful reception (after archiving, if selected)
2. Press OK to save your changes.

Path Options

Best Practices:

- At a minimum, set the Merge output (Sentinel GIS database or SDE connection file and Sentinel Configuration Manager settings are stored here), Mobile device software (program files, applets, and configuration files are stored here), Archive data to, Data with errors, and Transfer set configuration files (send-only file lists are stored here) to a shared network directory.
- Receive and Transmit paths may be on a network directory or local, but be aware that setting the receive path to a network location increases network traffic and may incur data transfer delays and permissions management.
- Use UNC paths instead of mapped drive letters (for example, \\MY_SERVER\Shared\Sentinel vs. Z:\Sentinel).
- At a minimum, back up the Merge output and Mobile device software folders regularly.

The screenshot shows the 'File Paths' dialog box with the following fields and values:

- Base path: C:\Program Files\DataLink GIS
- Receive data to: C:\Program Files\DataLink GIS\Data
- Transmit data from: C:\Program Files\DataLink GIS\Transmit
- Merge output: C:\Program Files\DataLink GIS\Merged Files
- Mobile device software: C:\Program Files\DataLink GIS\Hand-Held Software
- Archive data to: C:\Program Files\DataLink GIS\Archive
- Data with errors: C:\Program Files\DataLink GIS\Errors
- Transfer set configuration files: C:\Program Files\DataLink GIS\Transfer Sets
- Memory device drive letter: E:\
- Log messages to machine: localhost (Leave blank to log to local machine)

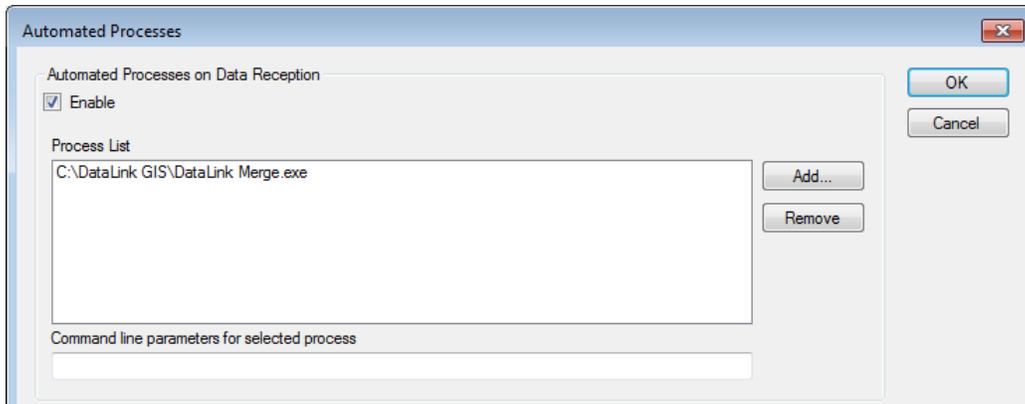
1. Click Options > File Paths. Set file path locations to a local or network location.
 - a. Base path: the default base path is C:\Program Files\DataLink GIS\ for Windows XP and C:\DataLink GIS\ for Windows 7 or 8. Changes to the base path will be inherited by all other paths (except memory device drive letter).
 - b. Receive Data To: This is the location field data will automatically be received to when a recognized device is connected. To avoid data overwrite, sub-folders are created by Transfer Set, Date, Device ID, and Suffix. For example, if Surveillance Data is received from a mobile device whose ID is 'Archer_5' on April 29, 2013, this data would be received to 'c:\Program Files\DataLink GIS\Data\Surveillance Data\20130429\Archer_5-

01.’ If data is received a second time on the same day from the same mobile device the data would be received to ‘...20130429\Archer_5-02.’

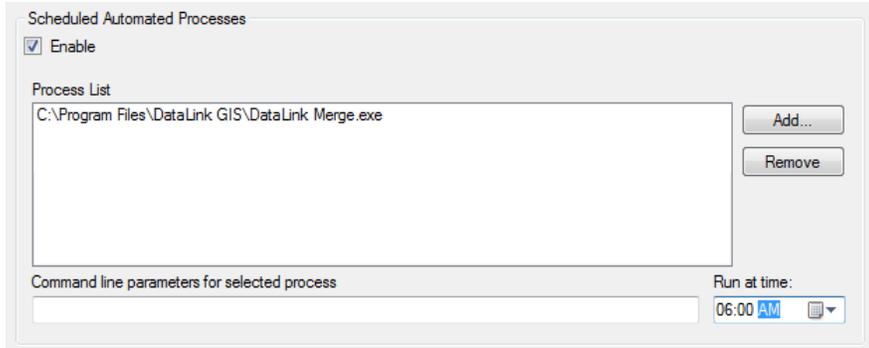
- c. **Transmit Data From:** This is the location where ArcPad map data will be extracted by the Sentinel toolbar in ArcMap or by DataLink Merge. DataLink GIS sends file that are located in this directory to recognized mobile devices.
- d. **Merge Output:** This is the location where the ‘Sentinel GIS’ geodatabase or SDE connection file is created when data is extracted for the first time, or the Sentinel GIS configuration utility is run for the first time. All field data that is processed by DataLink Merge will be merged to the geodatabase that is contained in this path or the SDE repository indicated by the SDE connection file in this path. The centralized Sentinel Configuration Manager (SCM) configuration is also stored in this path.
- e. **Mobile Device Software:** ArcPad applet files and program settings that are contained here will be sent to recognized mobile devices using DataLink GIS. Many options set in the Sentinel toolbar in ArcMap will make changes to configuration files contained in sub-directories of this folder.
- f. **Archive Data To:** When DataLink Merge runs, all valid data in the ‘Receive Data To’ folder is first merged to the geodatabase, and then archived. Sub-folders are created by Transfer Set, Date, Device ID, and Suffix as previously discussed.
- g. **Data With Errors:** If any portion of the DataLink Merge process fails for a particular data folder, it is moved here, so that other data folders can subsequently be processed.
- h. **Transfer Set Configuration Files:** Each module creates a “send-only file list” when data is extracted using the Sentinel GIS toolbar in ArcMap. The configuration files are created in this directory.
- i. **Memory Device Drive Letter:** If mobile data collection will be performed on a Windows laptop, DataLink GIS synchronizes data to a memory device (SD card or other removable memory). Specify the drive letter assigned to this memory device by Windows.
- j. **Log Messages to Machine:** The computer name where the logging server resides. If installed locally, this is ‘localhost’ or blank.

Automated Processes Options

1. Click Options > Automated Processes. Check the box to Enable Automated Processes on Data Reception if you would like DataLink Merge to process field data that is received from a recognized mobile device as soon as it is received. This option works well if you have a small number of mobile devices.



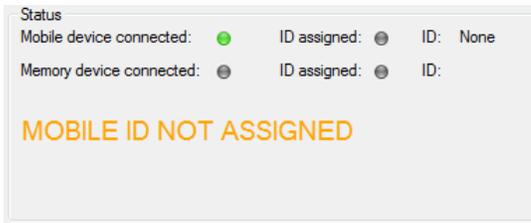
2. Optionally, uncheck the box to Enable Automated Process on Data Reception, and check the box to Enable Scheduled Automated Processes. Press the Add... button and browse to c:\Program Files\DataLink GIS\. Select DataLink Merge.exe. Set the time for the automated process to run. This option works well if you have a larger number of mobile devices. When DataLink Merge runs at the specified time, all data that has been received from recognized mobile devices that has not yet been merged will be processed. **Please Note:** *DataLink GIS must be running at the specified time for the automated process to execute. Another option is simply to run Merge manually from the DataLink GIS toolbar. The Windows Task Scheduler can be used to schedule Merge to run whether DataLink GIS is open or not.*



3. Click OK to save changes.

Devices

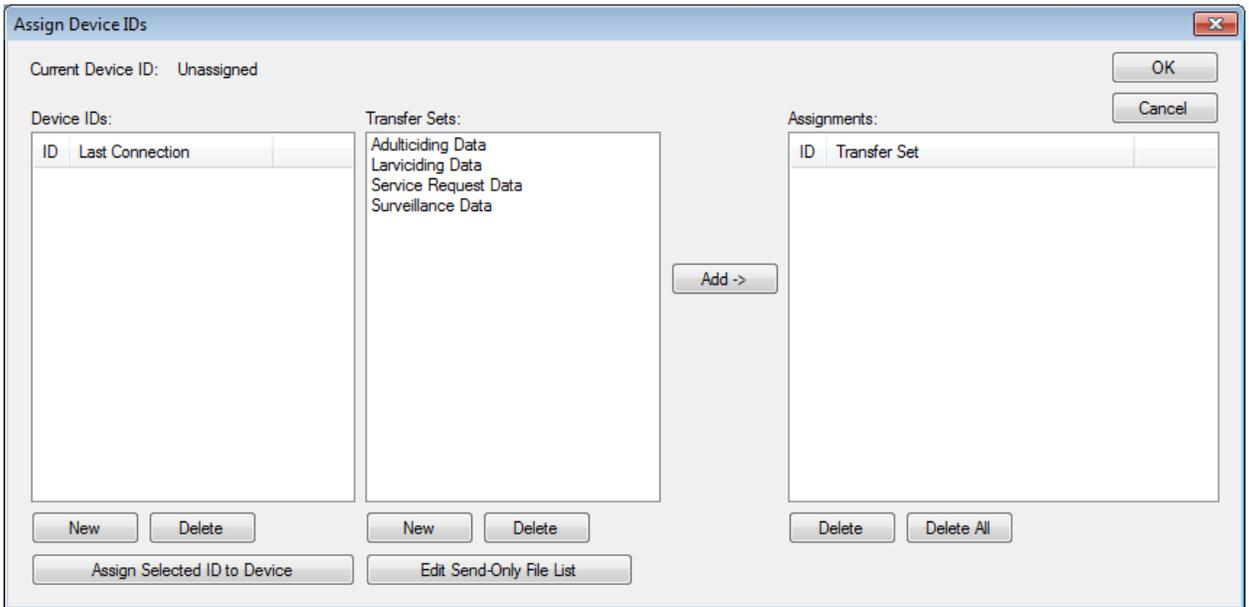
1. Connect your mobile device to your PC using Microsoft ActiveSync or Windows Mobile Device Center.
2. DataLink GIS will show that a device is connected, but not recognized.



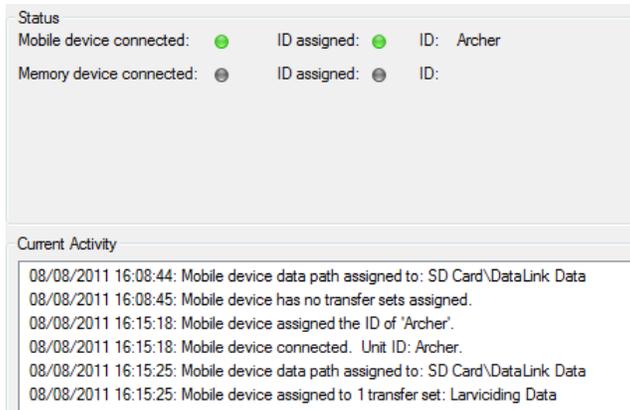
- Click the Devices button.



- The following dialog displays. Device IDs are created and assigned on the left. Available transfer sets are listed in the middle. Device-Transfer Set assignments are listed on the right.



- Click the **New** button under the Device IDs list. Type in a unique device ID and press Enter. The ID will be added to the list. The Device ID list can be created even if a device is not connected.
- Make sure the new ID is highlighted and click the **Assign Selected ID to Device** button. The currently connected device will be given the selected ID. If a mobile device and memory card device are both connected, the user must select one or the other.
- Make sure the new ID is highlighted, and then select the Transfer Set to assign to the device. Press the **Add ->** button to assign it to the selected device. Multiple transfer sets can be created.
- Click the **OK** button. The display should now change to indicate that the ID is recognized. Also, the activity log will indicate where the data path will be on the device. This is created on the SD Card on the mobile device (if there is one), or on the first non-volatile storage that is found (looking in reverse alphabetical order), such as Built-in Storage, SD-MMC Card, or Storage Card. If no removable memory is found, the data path will be created in \My Documents.



Set Password

All DataLink GIS options can be password-protected. This prevents inadvertent changes to file paths, transfer settings, or device assignments.

1. Click Options > Set Password.
2. Type in the new password. Confirm, then press OK.



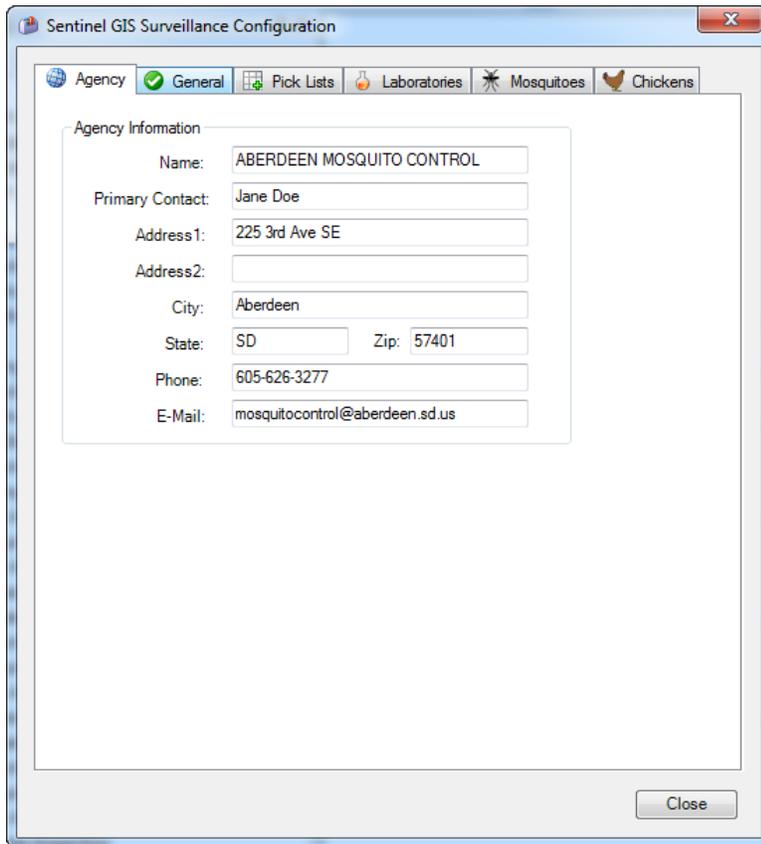
Surveillance Application Configuration Utility

Surveillance configuration options allow you to adapt the program to your operation, and to adjust as time goes on.

1. Start ArcMap.
2. Select Surveillance > Application Configuration Utility.

Agency

Enter your agency information. This will be placed on lab submission reports.



The image shows a screenshot of a software window titled "Sentinel GIS Surveillance Configuration". The window has a menu bar with the following items: "Agency", "General" (with a checkmark icon), "Pick Lists", "Laboratories", "Mosquitoes", and "Chickens". The "General" tab is active. Below the menu bar, there is a section titled "Agency Information" containing several text input fields:

- Name: ABERDEEN MOSQUITO CONTROL
- Primary Contact: Jane Doe
- Address1: 225 3rd Ave SE
- Address2: (empty)
- City: Aberdeen
- State: SD
- Zip: 57401
- Phone: 605-626-3277
- E-Mail: mosquitocontrol@aberdeen.sd.us

A "Close" button is located at the bottom right of the window.

General

The screenshot shows the 'Sentinel GIS Surveillance Configuration' window with the 'General' tab selected. The window contains several configuration sections:

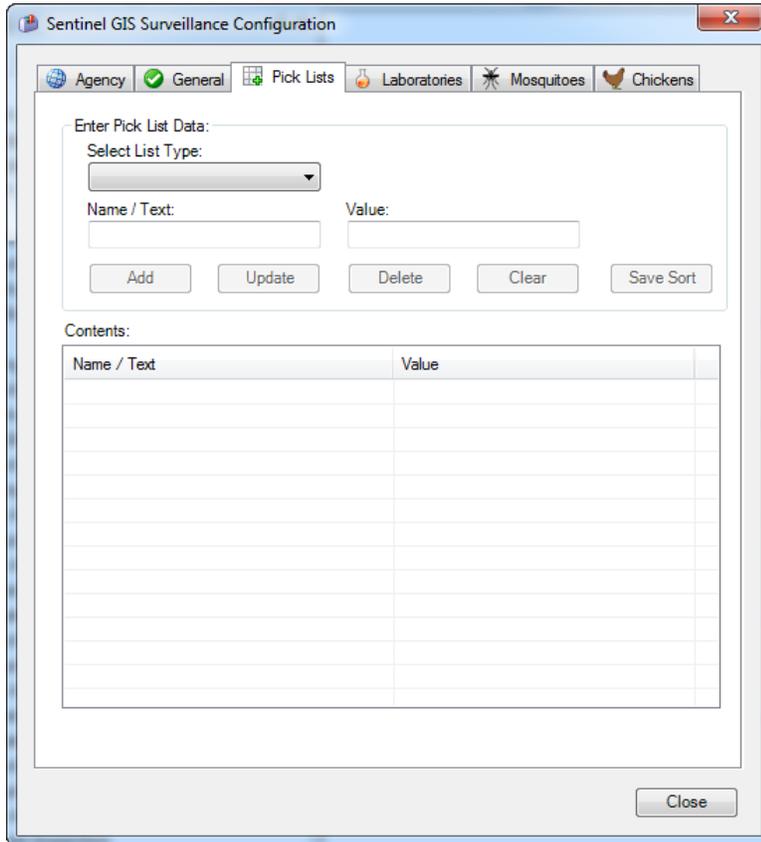
- Pool Size:** A numeric input field with the value '50' and a label 'Enter the number of mosquitoes in a single pool:'.
- Mobile Device Data History:** A dropdown menu labeled 'Output data for:' with the selected option 'All time (no time limit)'.
- TrackLog Interval:** A numeric input field with the value '0' and a label 'Number of seconds between capture (0 = off):'.
- Default Flock Site Sampling Interval:** A numeric input field with the value '0' and a label 'Number of days between samples:'.
- Default Lab Technician Name:** A text input field containing 'John Doe'.
- Service Request:** A checkbox labeled 'Include Service Request in extract to mobile' which is currently unchecked.
- Mobile Auto-Pan to GPS:** A checkbox labeled 'Set auto-pan to GPS 'true' on Device' which is currently unchecked.

A 'Close' button is located at the bottom right of the window.

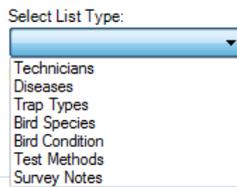
- **Pool Size.** Enter the number of female mosquitoes in a single pool. When trap surveys are processed and speciation and abundance details are entered, this option is used to automatically calculate the number of pools to create.
- **Mobile Device Data History.** Survey history is available on the handhelds. These filter settings help keep file size down and improve performance. Each time data is extracted from the database to send to the handhelds these filter settings are used.
 - Time limit: no limit, last day, week, month, year
- **Tracklog Interval.** A GPS tracklog can be recorded on the handhelds whenever the Surveillance application is running. (This tracklog will not be visible on the handheld map.) Configure the logging interval here. If set to 0, no tracklog is recorded.
- **Default Flock Sampling Interval.** If sentinel chicken flocks are used in surveillance activities, configure how often samples should ideally be taken. The sampling interval is used to determine the next sample date for flock sites.
- **Default Lab Technician Name.** Enter the default lab tech name. This is used for lab submissions.

Pick Lists

Pick lists are easy to configure. They are used by the handheld and desktop editing tools.



1. Select the pick list you would like to edit.



2. To add to the list, type in 'Name/Text' and 'Value' then press Add. The 'Name/Text' appears in the pick list on the handheld, while the 'Value' gets stored in the database.
3. To modify an item already on the list, select it, enter new text for Name/Text, enter new test for Value, and press Update.
4. To delete an item from the list, select it and press Delete.
5. The "Clear" button is only enabled when an existing list item is selected. Pressing "Clear" will clear the contents of Name/Text and Value so you can enter a new pick list item. It will not clear the list or delete the selected value from the list.

Pick List Types

- **Technicians.** Employee list.
- **Diseases.** Diseases tested for; used in entry of lab results for pools, dead birds, and chicken blood samples.
- **Trap Types.** Adult trap types; used for trap surveys (set trap).
- **Bird Species.** List of bird species; used for dead birds.
- **Bird Condition.** Condition of dead bird sample.
- **Test Methods.** Used for entry of lab results for pools, dead birds, and chicken blood samples.
- **Survey Notes.** Used for quick entry of common notes when setting or retrieving a trap.

Sort Pick Lists/Save Sort

Pick lists can be sorted by dragging and dropping an item to its desired place in the list. For example, you can drag most often used choices to the top of the list.

Contents:

Name / Text	Value
Crow	Crow
Blue Jay	Blue Jay
Raven	Raven
Robin	Robin

Pick lists can also be sorted alphabetically. Click on the column heading for Name/Text or for Value to sort from A to Z. Click again to sort from Z to A.

Contents:

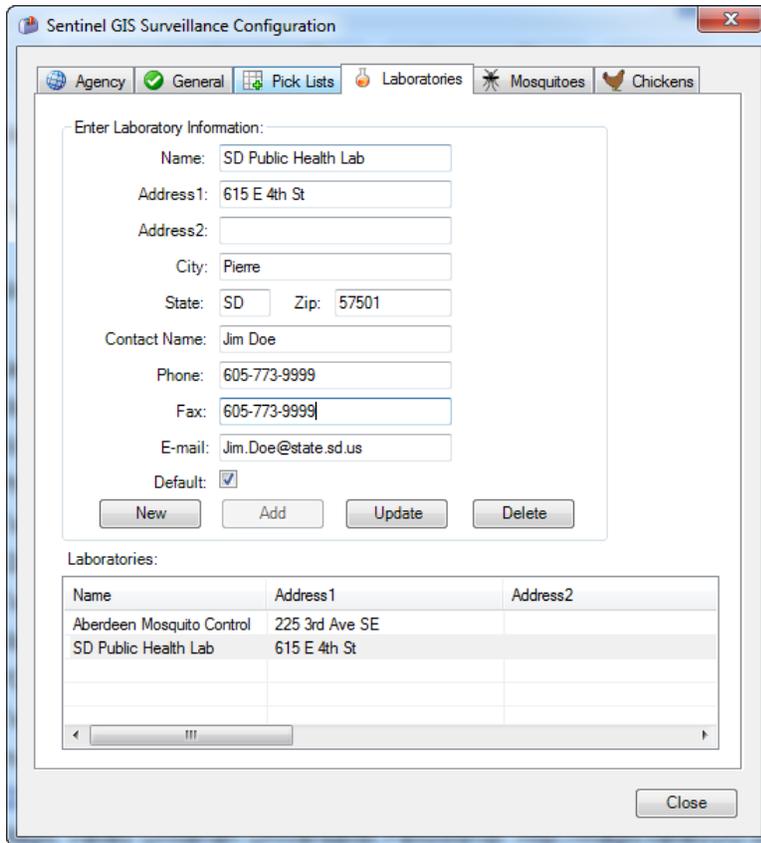
Name / Text	Value
Blue Jay	Blue Jay
Crow	Crow
Raven	Raven
Robin	Robin

Click Save Sort to save changes to the pick list order.



Laboratories

Configure the laboratory details for labs that you will send samples to (including internal labs). These details will appear in lab submission reports.



The screenshot shows the 'Sentinel GIS Surveillance Configuration' window with the 'Laboratories' tab selected. The form contains the following fields:

- Name: SD Public Health Lab
- Address1: 615 E 4th St
- Address2: (empty)
- City: Pierre
- State: SD Zip: 57501
- Contact Name: Jim Doe
- Phone: 605-773-9999
- Fax: 605-773-9999
- E-mail: Jim.Doe@state.sd.us
- Default:

Buttons: New, Add, Update, Delete

Laboratories:

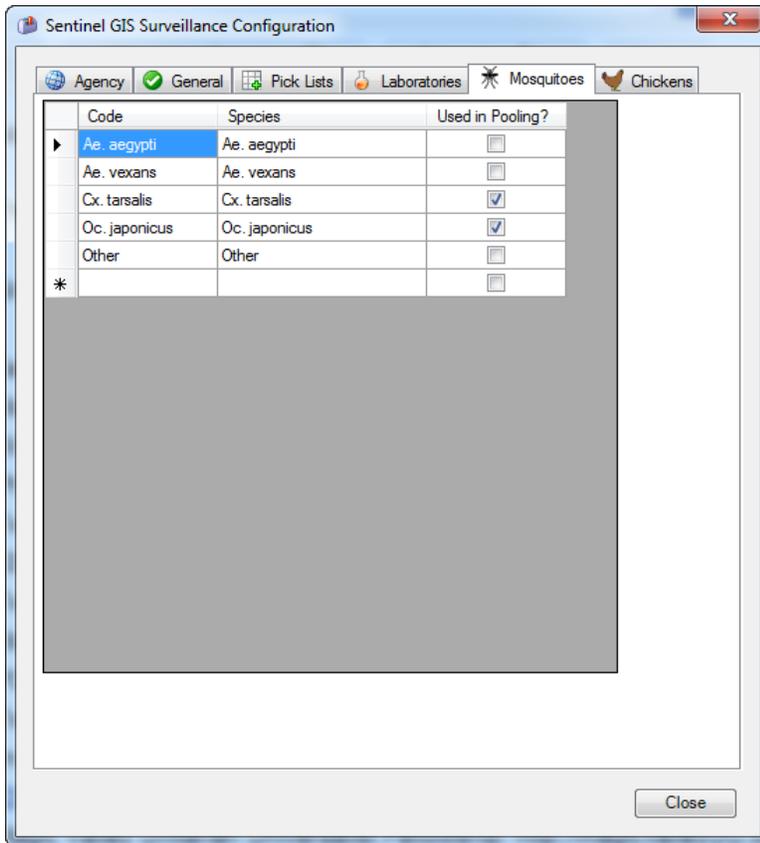
Name	Address1	Address2
Aberdeen Mosquito Control	225 3rd Ave SE	
SD Public Health Lab	615 E 4th St	

Close

1. To add a new laboratory, enter information then press Add.
2. To edit existing lab details, select a lab from the list at the bottom, type in additions or corrections, then press Update.
3. To clear information, press the New button.
4. To delete an existing lab, select it from the list at the boom, then press Delete. Confirm the action when prompted.
5. Check the Default option if one lab will be used most of the time.

Mosquitoes

Configure which mosquito species that will be available for speciation and abundance entry in desktop Surveillance Tools, and which will be used in pooling.



1. Uncheck the 'Used in Pooling?' box for any species that will not be pooled and tested.
2. To delete a species item, click the row head then press the Delete key on your keyboard.

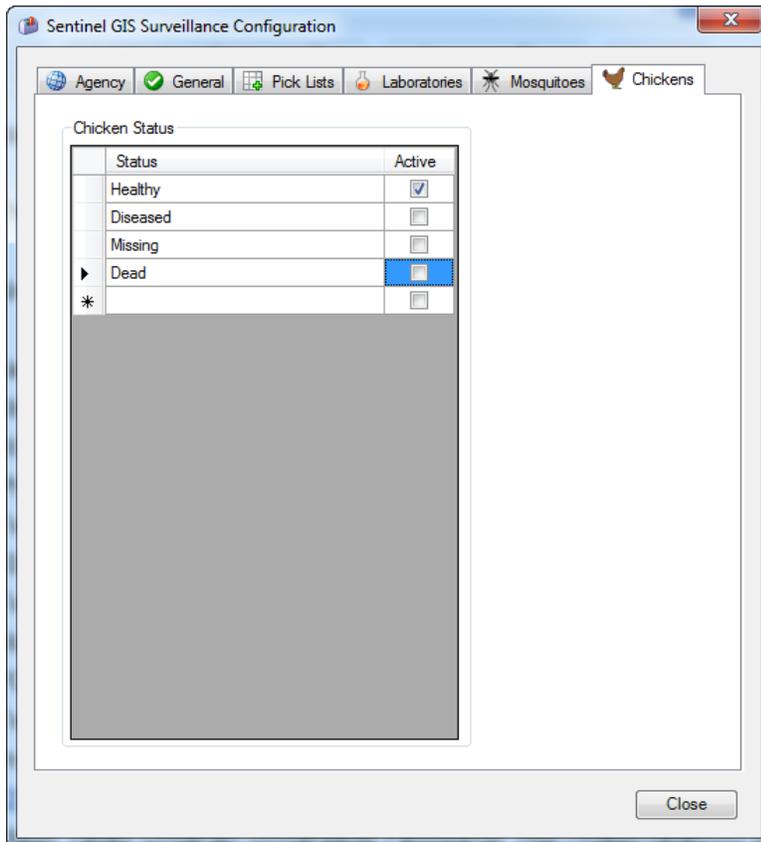
▶ Ae. vexans	Ae. vexans	<input checked="" type="checkbox"/>
▶ albopictus	albopictus	<input checked="" type="checkbox"/>
An. barberi	An. barberi	<input checked="" type="checkbox"/>
An. bradleyi	An. bradleyi	<input checked="" type="checkbox"/>

3. To edit an existing entry, click in the data cell for Code or Species and type the adjusted information. The change is saved when the focus changes (when you click the mouse cursor somewhere else).
4. To add a new species entry, click in the first blank line at the bottom of the table and start typing. The new record is saved when the focus changes.

Chickens

Configure the pick list for chicken status entry. This is used when sentinel flock surveys are conducted, and blood samples records are created for individual chickens.

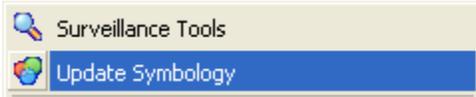
Specify whether the entry represents active or inactive status. Inactive chickens will not be sampled in future surveillance activities.



Surveillance Toolbar Options

Update Symbology

Click the Surveillance toolbar, then select Update Symbology. This updates the symbology if field data from handheld devices has not been merged recently.



When data from handheld devices is merged to the database, symbology is updated. But perhaps it has been some time since data was merged. For example, perhaps handhelds were last synchronized before the weekend. On Monday morning when you look at your map, it may not correctly reflect the required actions for the current day.

Symbology for Flock Sites is based on the next required action.

- TrapSite
 - Inactive
 - Active
- DeadBird
 - Inactive
 - Active
- LandingSite
 - Inactive
 - Active
- FlockSite
 - Inactive
 - Sample
 - No Action Required

The next required action is based on the next action date. For example, chicken flocks may have a 14-day sampling interval. When a flock survey is completed, the flock site would be set to 'No Action Required' and the next sample date would be set for 14 days from the current date.

Set Zone Layer

The zone layer must be a polygon layer and must be loaded in the current map.

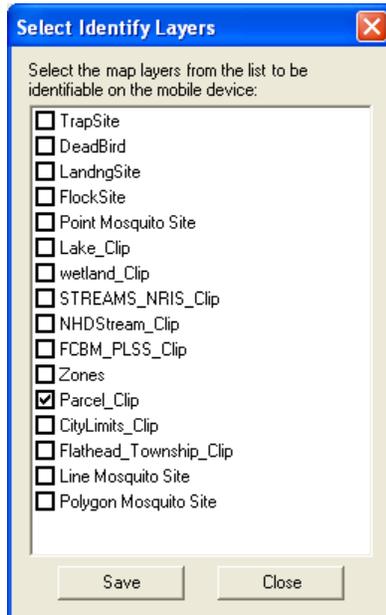
Click the Surveillance toolbar, then click Set Zone Layer. Specify the layer name, and the field containing zone names. Each zone name must be unique.



When the zone layer is configured, new sites that are created will automatically record the zone they are geographically in. The mobile application also lets you search for task list items and sites by zone and zoom to a particular zone.

Identify Layers

Select which layers should be identifiable in ArcPad. Any layer configured in this manner will display information when the Identify tool is used in ArcPad.



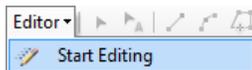
Sentinel Chicken Flocks

If sentinel chicken flocks will be used in surveillance activities, flock sites must be created on the desktop in ArcMap. No option exists to create them on the handhelds. Flocks are created and assigned to flock sites.

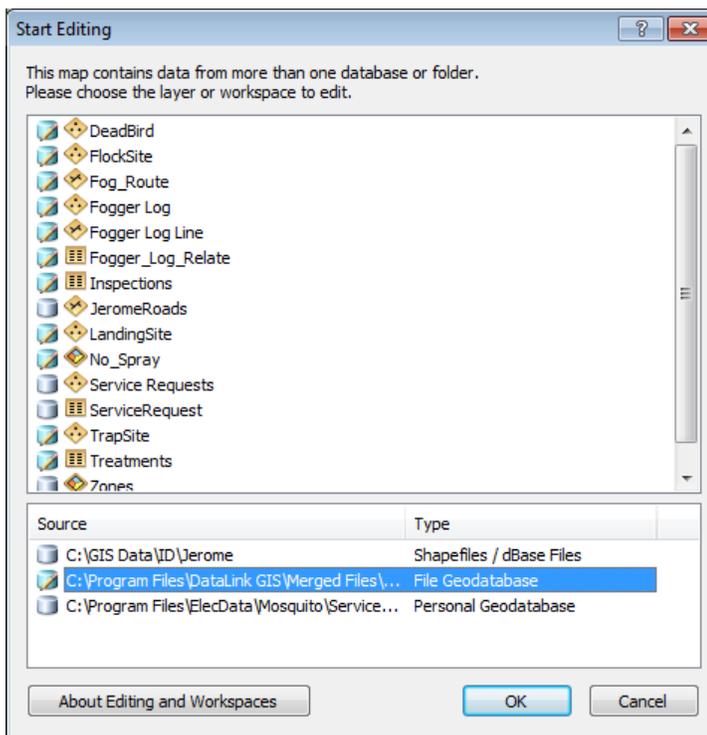
Create Flock Sites

Flock sites are created using standard editing tools in ArcMap.

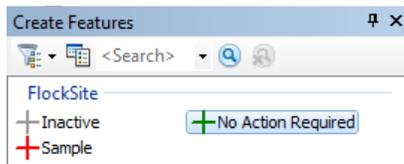
1. Click Editor > Start Editing. If the Editor toolbar is not displaying, turn it on by clicking View > Toolbars > Editor.



2. If some map data exists in other locations besides your SentinelGIS geodatabase, you will be prompted to select your edit workspace. Select the geodatabase and start editing.



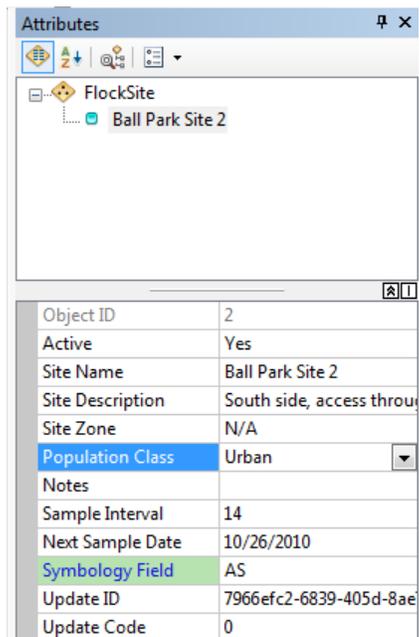
- In the Create Features dialog, choose one of the categories for **FlockSite**.



- Click on the map to add a new Flock Site.
- Click the Attributes button on the Editor toolbar.



- Enter attributes for the new site.



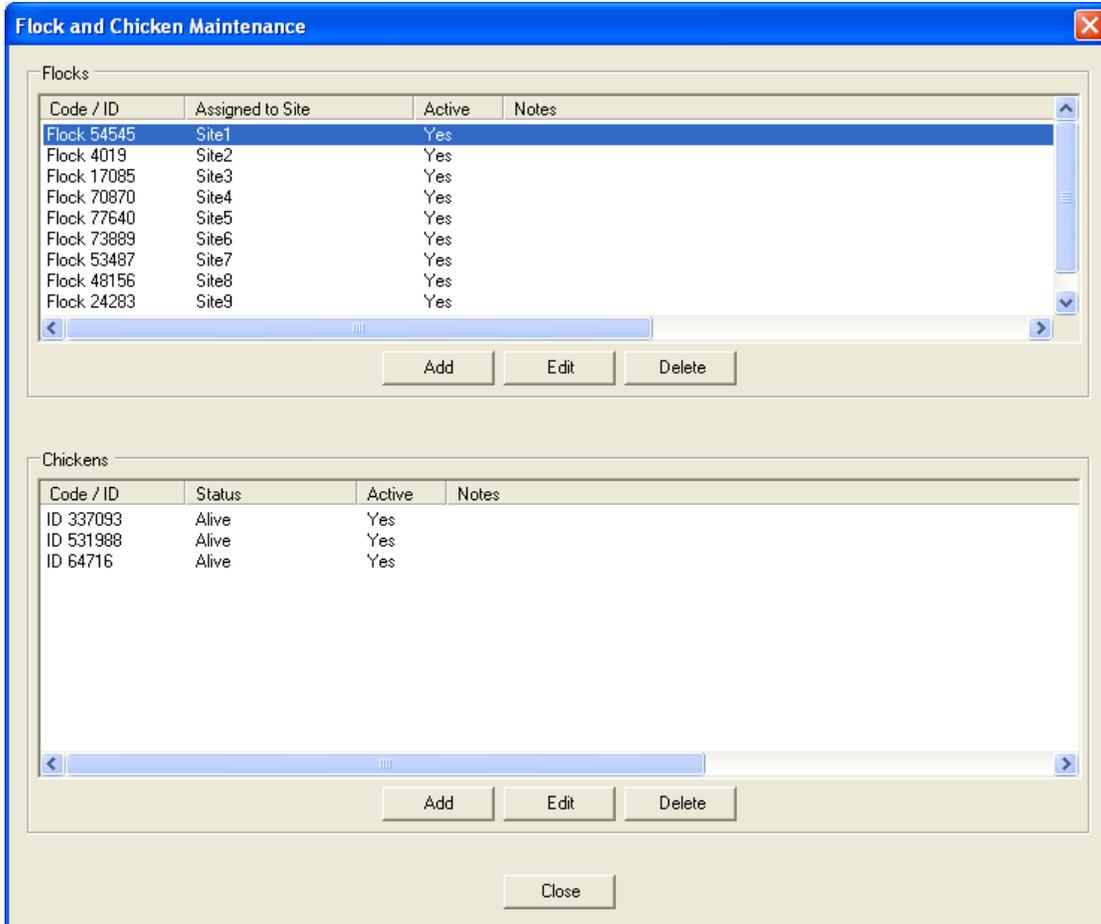
- When finished adding all new sites, click Editor > Stop Editing. When prompted, save your edits.

Edit Flocks

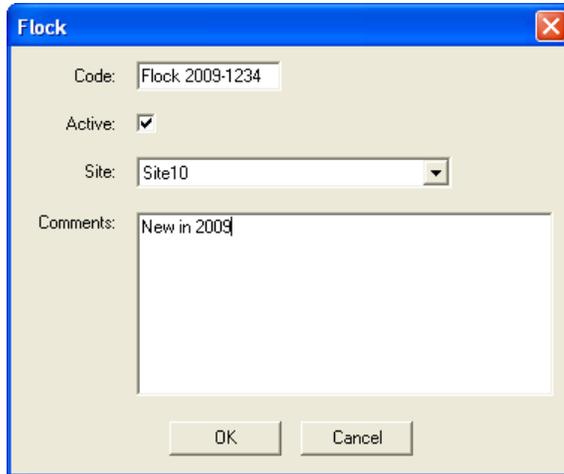
- Click Surveillance > Surveillance Tools.
- Click the Sentinel Chickens tab.

Create Flocks

1. Click the Edit Flocks button in the upper right. The Flock and Chicken Maintenance dialog displays. The top area displays sentinel flocks. The bottom area displays chickens assigned to the currently selected flock.



2. In the Flock section, click Add to create a new flock. Enter in the flock details, including the Code (identifier or name), whether the flock is active, which Flock Site the flock will be assigned to (note: only flock sites that have already been created and named will be listed), and Comments. Click OK to save the new flock.



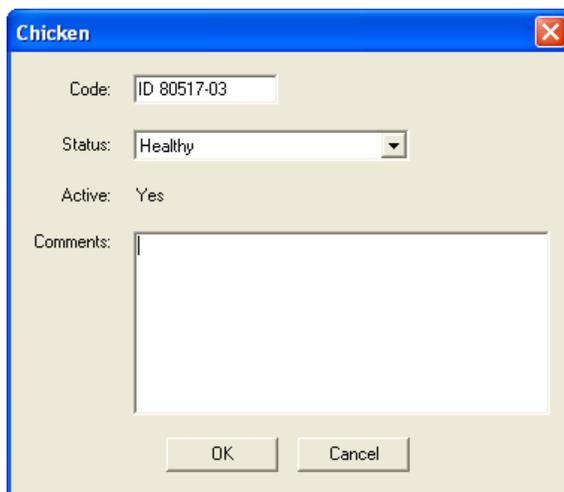
The screenshot shows a dialog box titled "Flock" with a close button (X) in the top right corner. It contains the following fields and controls:

- Code:** A text input field containing "Flock 2009-1234".
- Active:** A checked checkbox.
- Site:** A dropdown menu currently showing "Site10".
- Comments:** A large text area containing "New in 2009".
- Buttons:** "OK" and "Cancel" buttons at the bottom.

3. (inactive), select the flock then press Edit. After making changes, press OK.
4. To delete a flock, select it and press Delete.

Assign Chickens to Flocks

1. Select a flock, then in the Chickens section, press Add. Enter in the chicken details, including the Code (band number, identifier), the initial Status, and Comments. Click OK. Repeat for additional chickens.



The screenshot shows a dialog box titled "Chicken" with a close button (X) in the top right corner. It contains the following fields and controls:

- Code:** A text input field containing "ID 80517-03".
- Status:** A dropdown menu currently showing "Healthy".
- Active:** A text input field containing "Yes".
- Comments:** A large empty text area.
- Buttons:** "OK" and "Cancel" buttons at the bottom.

2. To edit chicken details, select it (you must select its flock first), then press Edit. Enter changes then press OK.
3. To delete a chicken, select it then press Delete.

Creating a Surveillance Map for the Mobile Devices

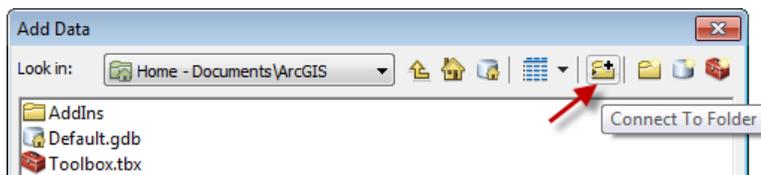
Create a map in ArcMap that contains the layers, symbology, and settings that will be used on the handhelds in the ArcPad map. After the map is set up, extract it for sending to the handhelds with DataLink GIS.

Create a Map in ArcMap

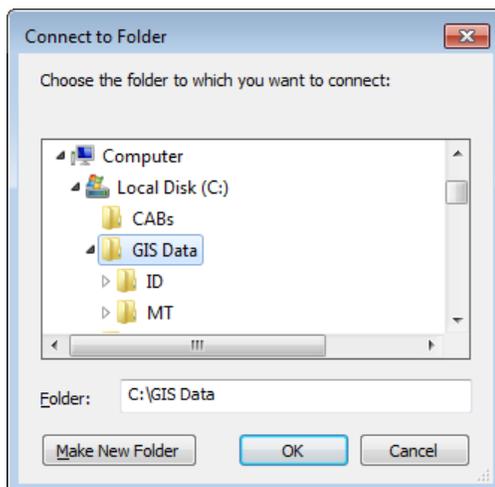
1. In ArcMap, press the Add Data button.



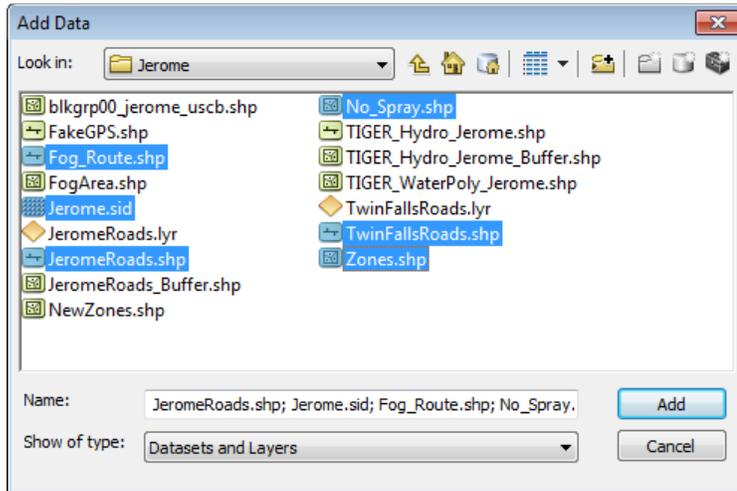
2. If you are using ArcGIS for the first time, press Connect to Folder to set up a folder connection.



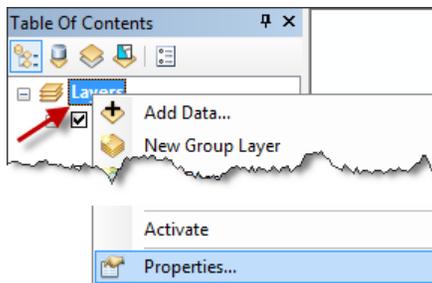
3. Browse to the folder you'd like to connect to and press OK. For example, if all of your GIS data is on C:\GIS Data\ or Z:\Users\Public\GIS Data\, add that folder connection.



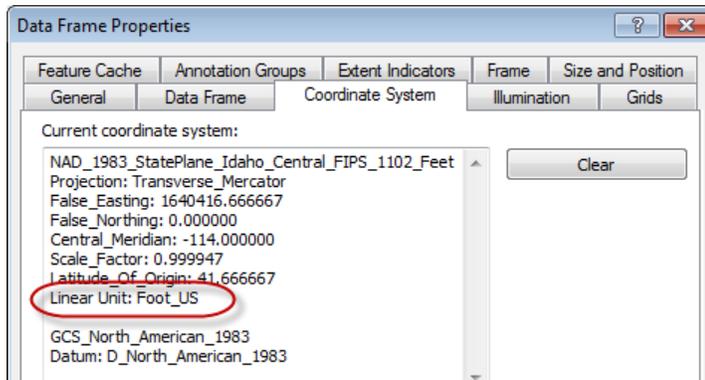
- Browse to the location of the GIS data that you would like to use in the mobile application. (For a full listing of data formats that are compatible with ArcMap, see ArcGIS Desktop Help. Search for “Data formats supported in ArcGIS”. Please note that not all data that is compatible with ArcMap can be extracted for use on a mobile device. For example, ArcGIS Online content, images in an Image Server, or StreetMap data cannot typically be extracted from ArcMap, although there may be alternative methods for creating a static copy of this data.) Select your data layer(s) and press Add. Hold down the Ctrl key on your keyboard to select more than one layer.



- Right-click the data frame and select Properties.



- Verify the coordinate system and map units used in the data frame. By default, this will be the coordinate system of the first layer that is added into the data frame. **Please Note:** *The data that will be sent to ArcPad will be created in the coordinate system of the data frame.*



Layer Properties

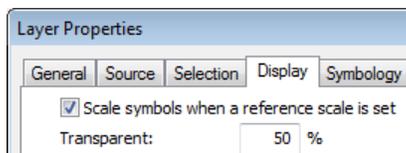
Set layer properties, including symbology, labels, scale ranges, and visible fields. This optimizes the map appearance and program performance in ArcPad.

Symbology and Labels

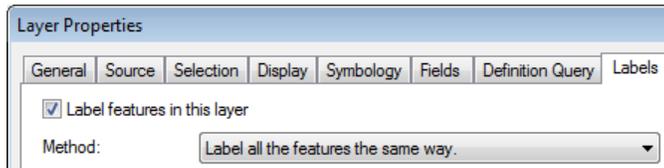
- In the ArcMap Table of Contents, click directly on the symbol for a given layer.



- Select the desired symbol and color in the Symbol Selector and press OK.
- To set transparency for polygon features, so that other features are visible on the map underneath them, right-click the layer name in the Table of Contents and select Properties. In Layer Properties, select the Display tab. Enter the % transparency and click Apply.



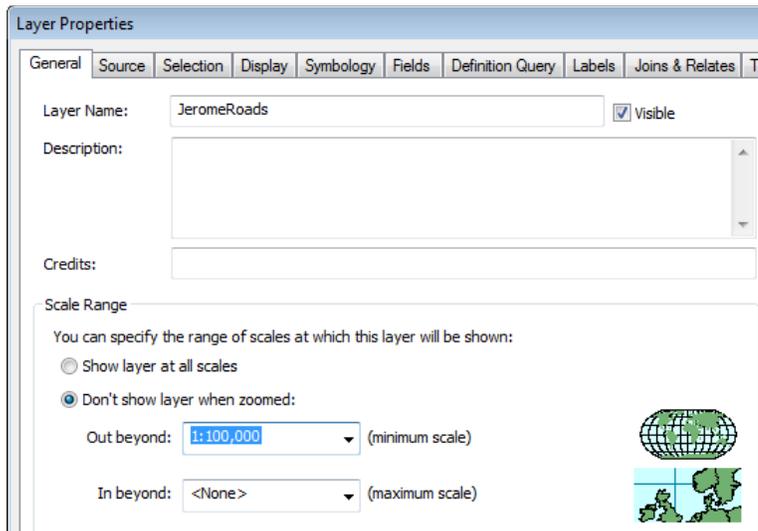
- Click on the Labels tab. Check the box to label features. Specify font settings and click Apply.



Display Scale

Configuring display scale settings improves ArcPad performance and map readability. If a layer contains thousands of features and would take a long time to draw at the full map extents, set the display scale so that the layer is only drawn when you zoom in on the map.

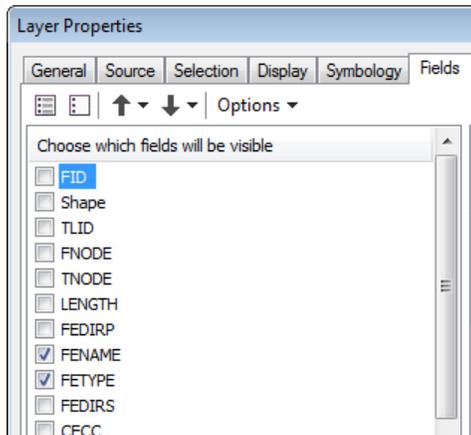
- In Layer Properties, click on the General tab. Click the radio button 'Don't show layer when zoomed: Out beyond:' and specify an appropriate scale. Click Apply.



Visible Fields

Turning off fields for background layers such as roads, parcels, section lines, etc., greatly reduces file size and improves program performance.

1. In Layer Properties, click on the Fields tab. Uncheck the box next to any fields that are not needed on the mobile device.

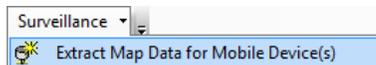


2. Click Apply, or OK to close Layer Properties.

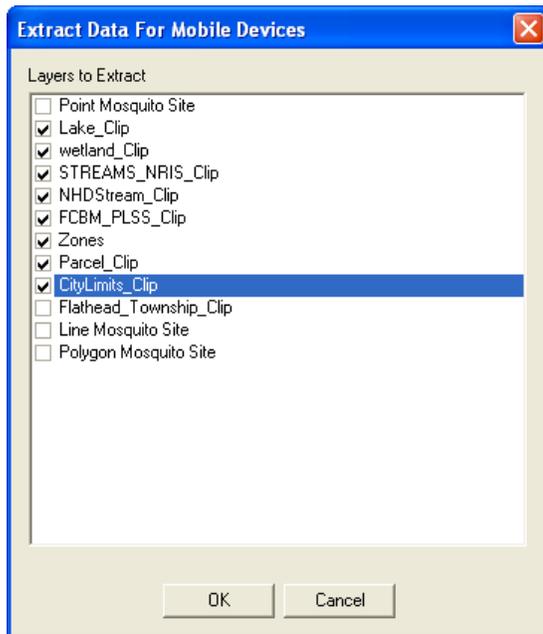
Extract Data

Extract data after the map is set up and saved the way you would like. You do not have to extract data each time you connect handheld devices. If you add new layers to the map, or make symbology changes, you should extract again. If you collect new Sentinel data, it will automatically be extracted for sending to the handhelds when DataLink Merge runs.

1. Click the Surveillance drop-down and select Extract Map Data for Mobile Device(s).

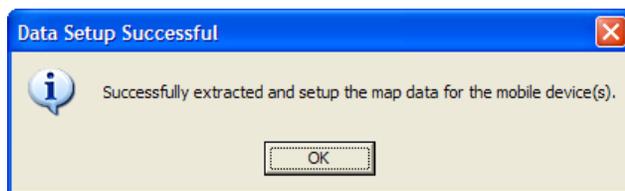


2. Select which layers to extract as background layers. All surveillance layers (flock sites, trap sites, landing count sites, and dead bird locations) are extracted automatically.



3. The following actions take place.
 - a. The full extent of all selected vector (point, line, polygon) data in the active data frame will be extracted to a staging area and compared to data in the DataLink GIS Transmit directory (typically c:\Program Files\DataLink GIS\Transmit\Surveillance Data\All\Send Only\). If data in the staging area is not different from that already in the DataLink GIS directory, it will not be re-extracted or re-sent to the handhelds. **Please Note:** *Raster data is not extracted for use in the mobile device due in part to file size limitations for MrSID encoding, and performance and storage limitations on many mobile devices. Also note that the full extent of all vector data is extracted, regardless of zoom extent and layer visibility.*
 - b. A Send-Only file list will be created for DataLink GIS. All vector data that is extracted is added to this list. Files on this list will not be received by DataLink GIS after data is collected in the field. When DataLink GIS sends files to the mobile device, it will only send files on this list if the data on the PC is newer than the data on the mobile.
 - c. An ArcPad.apm (.apm = ArcPad map file) file is automatically created that references all of the map data. All symbology, labeling, and field visibility settings will be retained in the ArcPad map.
 - d. If it does not exist already, a SentinelGIS file geodatabase will be created in the DataLink \Merged Files\ directory. If SDE was selected during install, SDE connection details must be specified. An SDE database must be created manually in ArcCatalog before specifying connection details to it. The Surveillance program will create all required feature classes, tables, and domains. **Please Note:** *The feature classes in this geodatabase will assume the same spatial reference as the data frame.*

- e. You will be notified if data was successfully extracted. Press OK.



3. If you have not already done so, you will be prompted to save your ArcMap MXD file (your map document).
4. Choose a location for your ArcMap Document (.mxd), enter a File name, and press Save.

Synchronizing Data With Mobile Devices

DataLink GIS synchronizes map data, survey records, Sentinel program files and configuration files with all recognized mobile devices.

Receive Files

DataLink GIS is usually configured to automatically receive (and archive, then clear) data files from the handhelds whenever one is connected. (See the Configuration section of this manual, under 'DataLink GIS.')

If this option is not turned on, it can be manually performed in DataLink GIS.

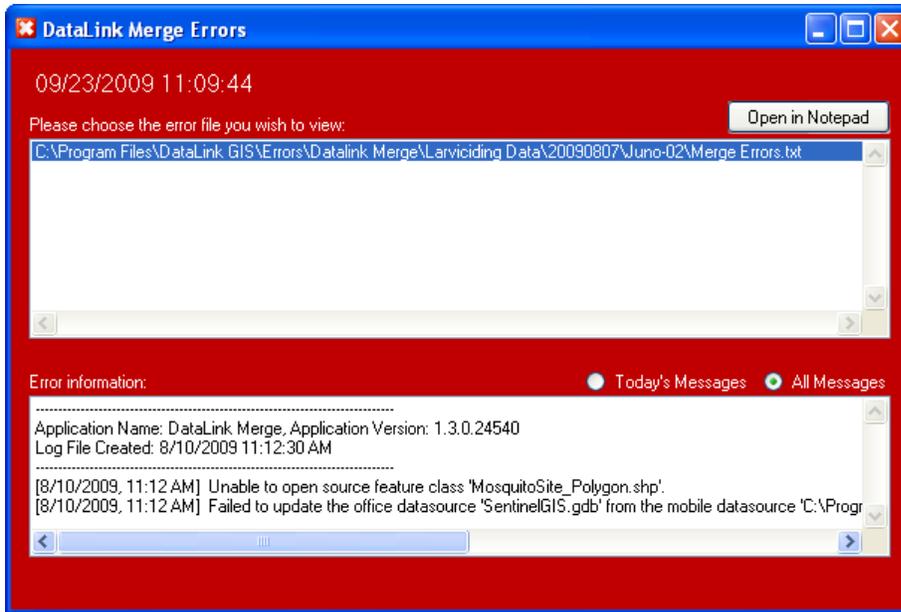
1. Press the Receive button in DataLink GIS.



Merge

DataLink GIS is usually configured to automatically merge data as soon as it is downloaded from a handheld. The Merge process manages transactions with the geodatabase, pushing new and modified data into it, and extracting updated information from it. All data that has been received from handhelds is evaluated by the Merge process, merged to the geodatabase, and archived. Updated information is extracted from the geodatabase to the DataLink Transmit directory.

If any errors are encountered while merging data, the program will report the problem, move the offending data to the configured DataLink GIS \Errors folder, and continue processing remaining data. The DataLink Merge Errors program will list the location of any problem files and the reason for the error.



This program can be run manually at any time by pressing the Merge button in DataLink GIS.



DataLink Merge can also be configured to run at a specific time, rather than each time data is received from a handheld. (See the Configuration section > DataLink GIS Options.) DataLink GIS must be running at the specified time in order for the Merge process to run successfully.

Send Files

DataLink GIS is usually configured to automatically send files, after it has received any new data from a handheld and successfully merged it. If this option is turned off, data can be sent manually in DataLink GIS.

1. Press the Send Files button to transfer the GIS data, pick lists, surveys, program files and configuration settings to your connected mobile device. **Caution: if map data, including Sentinel data, is newer on the desktop than it is on the handheld, handheld data will be overwritten.**



Mobile Operation

User Interface

Main Toolbar



1 2 3 4 5 6 7

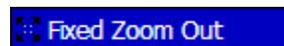
1. Zoom In tool. Click the tool, then tap and drag a diagonal line on the map. A Zoom box will display until you release the tap/drag motion. After releasing, the map will zoom in on the extent you selected.

- a. Submenu: Fixed Zoom In. Select this button to zoom in on the center of the map.



2. Zoom Out tool. Click the tool, then tap and drag a diagonal line on the map. A Zoom box will display until you release the tap/drag motion. The larger the box, the farther out the map will zoom after you release.

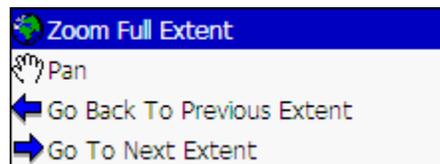
- a. Submenu: Fixed Zoom Out. Select this button to zoom out from the center of the map.



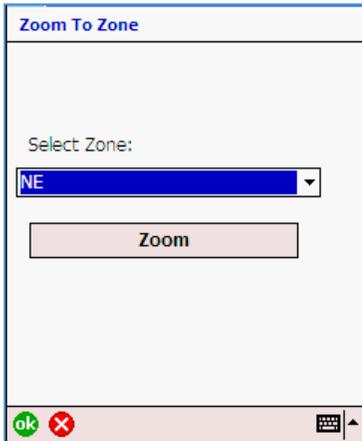
3. Zoom Full Extent. Tap the button to zoom to the full extent of the map.

- a. Submenu: Pan, Go Back to Previous Extent, Go to Next Extent

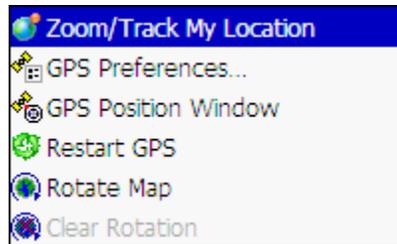
- i. Pan: Click the tool, then tap and drag the map to move it around in any direction.
- ii. Go Back to Previous Extent: tap the button to go back.
- iii. Go to Next Extent: tap the button to go forward.



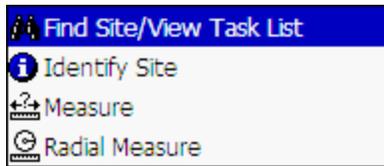
4. Zoom to Zone. If a zone layer is configured (see Configuration section, in the Surveillance Toolbar Options sub-section), you can select the zone then press Zoom.



5. Zoom/Track My Location. Tap this button to center the map on your GPS location.
 - a. Submenu: GPS Preferences, GPS Position Window, Restart GPS, Rotate Map, Clear Rotation.
 - i. GPS Preferences: Tap this button to change GPS Preferences. These changes will only apply to the current session, and will be reset when Sentinel is restarted. (See the Sentinel GIS Installation Guide for more information about GPS Preferences, and changing GPS settings permanently for all handhelds.)
 - ii. GPS Position Window: Tap this button to open ArcPad's GPS Skyplot and other information screens to view GPS status and quality.
 - iii. Restart GPS: Tap this button to re-connect to the GPS receiver.
 - iv. Rotate Map: Tap this tool, then tap and drag on the map to change the map rotation to a direction other than North.
 - v. Clear Rotation: Tap this button to reset the map orientation to North.

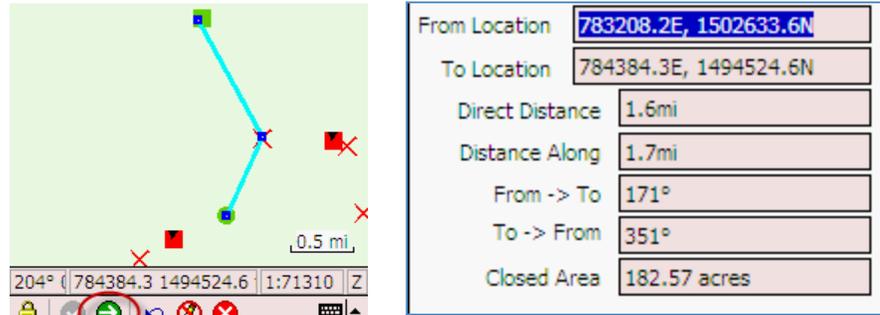


6. Find Site/View Task List. Tap this button to open the Find Site/Task List dialog. This is discussed in more detail in an upcoming section ([Using the Task List/Find Utility](#)).
 - a. Submenu: Identify Site, Measure, Radial Measure.

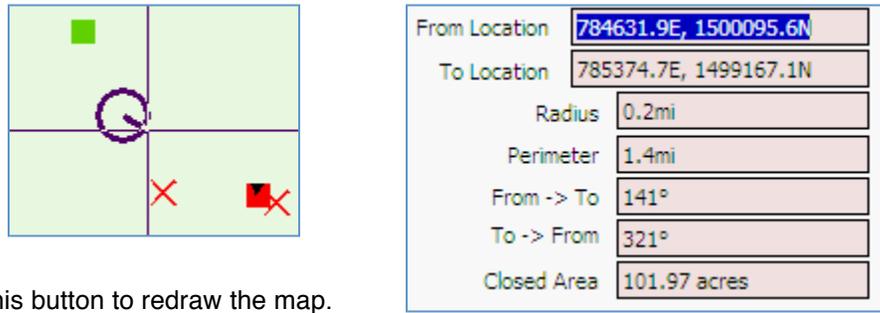


pl, then tap a feature to view information about it. The configured (see Configuration section, under [Identify](#)

- ii. Measure: Tap this tool, then tap on the map to add vertices to a 'measure line.' Then tap the Proceed button (green arrow) to view the measurement.

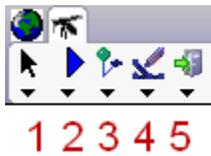


- iii. Radial Measure: Tap this tool, then tap and drag on the map to define the radius of a circle. When you release the tap/drag, measurement info will display.

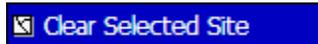


- 7. Refresh: Tap this button to redraw the map.

Surveillance Toolbar



- 1. Select. Tap this tool, then tap a Surveillance feature to select it. This tool works with Trap Sites, Flock Sites, Dead Bird locations, and Landing Count Sites.
 - a. Submenu: Clear Selected Site.



- 2. Create Sites. Tap the drop-down to select the site type and method. GPS collection begins as soon as the option is selected. Pen collection takes place after the tool is selected and you tap on the map. *Note: Sentinel chicken flock sites can only be created on the desktop using ArcMap.*



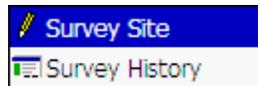
3. Modify Site Information. Select a site first with the Select tool, then tap this button to modify site information.

- a. Submenu: Delete Selected Site. Select a site first with the Select tool, then tap this button to delete it. Only sites created on the current day can be deleted on the handhelds.



4. Survey Site. Select a trap, flock, or landing count site first with the Select tool, then tap this button to perform a survey.

- a. Submenu: Survey History. Select a site first, then tap this button to view history.



5. Exit. Tap this button to exit the application. There is no need to save before exiting.

- a. Submenu: About Sentinel GIS. Tap to view version information.



Creating New Features with GPS or Pen

New trap sites, dead bird locations, and landing count sites can be recorded in the field using GPS or the pen. GPS collection follows the rules set in ArcPad's GPS Preferences. (For more information see the *Sentinel GIS Installation Guide* or *ArcPad Reference Guide*.)

Mosquito Trap Sites

Enter the trap site name. The zone is automatically entered if a zone layer is configured. Optionally enter a description, the population class, the status, and notes. Tap OK to save the site.



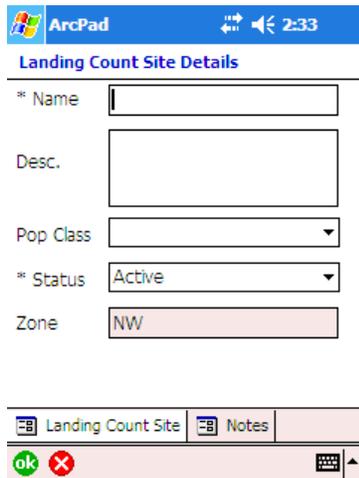
The screenshot shows the ArcPad interface for creating a 'Trap Site'. The title bar indicates 'ArcPad' and the time '2:32'. The form is titled 'Trap Site Details' and contains the following fields:

- * Name: City Park SE
- Desc.: Near pool
- Pop Class: Urban (dropdown menu)
- Status: Active (dropdown menu)
- Zone: NW

At the bottom, there are tabs for 'Trap Site' and 'Notes', and a navigation bar with 'ok', a red 'X', and a keyboard icon.

Landing Count Sites

Enter the landing count site name. The zone is automatically entered if a zone layer is configured. Optionally enter a description, the population class, the status, and notes. Tap OK to save the site.



The screenshot shows the ArcPad interface for creating a 'Landing Count Site'. The title bar indicates 'ArcPad' and the time '2:33'. The form is titled 'Landing Count Site Details' and contains the following fields:

- * Name: (empty text box)
- Desc.: (empty text box)
- Pop Class: (empty dropdown menu)
- * Status: Active (dropdown menu)
- Zone: NW

At the bottom, there are tabs for 'Landing Count Site' and 'Notes', and a navigation bar with 'ok', a red 'X', and a keyboard icon.

Dead Bird Location

Enter the species, sex, condition, and estimated date and time of death. The zone is automatically entered if a zone layer is configured. Optionally enter the population class.

Tap the Address tab to enter address information.

Optionally, tap the Notes tab and enter additional notes.

The image displays two screenshots of the ArcPad application interface for entering dead bird location details. Both screenshots show the 'Dead Bird Location Details' form with a blue header bar containing the ArcPad logo and signal strength indicators.

The left screenshot shows the 'Dead Bird' tab selected. The form contains the following fields:

- * Species: Raven
- * Sex: Male
- * Condition: Dead Usable
- * Estimated date & time of death: 9 /24/09 (with a checked checkbox and a time field set to 17:00 (HH:MM))
- Pop Class: Urban
- Zone: NW

The right screenshot shows the 'Address' tab selected. The form contains the following fields:

- Address where dead bird was found:
- Street 1
- Street 2
- City
- State, Zip

Both screenshots show a bottom navigation bar with 'Dead Bird', 'Address', and 'Notes' tabs, and a bottom status bar with 'ok', a red 'X', and a keyboard icon.

Editing Site Details

1. Tap the Select tool.



2. Tap a feature to select it. The feature will appear with a dashed line around it.



3. Tap the Modify Site button.



4. Modify information as needed then tap OK to save.

Creating New Surveys

Recording surveys provides a record of who performed an activity, when they performed it, and where they were when they recorded their activity. Trap site surveys and sentinel chicken flock surveys are also processed in the desktop Surveillance Tools.

1. Tap the Select tool.



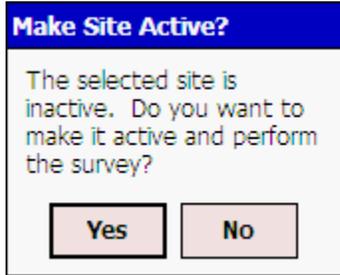
2. Tap a feature to select it. The feature will appear with a dashed line around it.



3. Tap the Survey Site button.



4. If the selected site is inactive you will be asked whether you want to make it active.



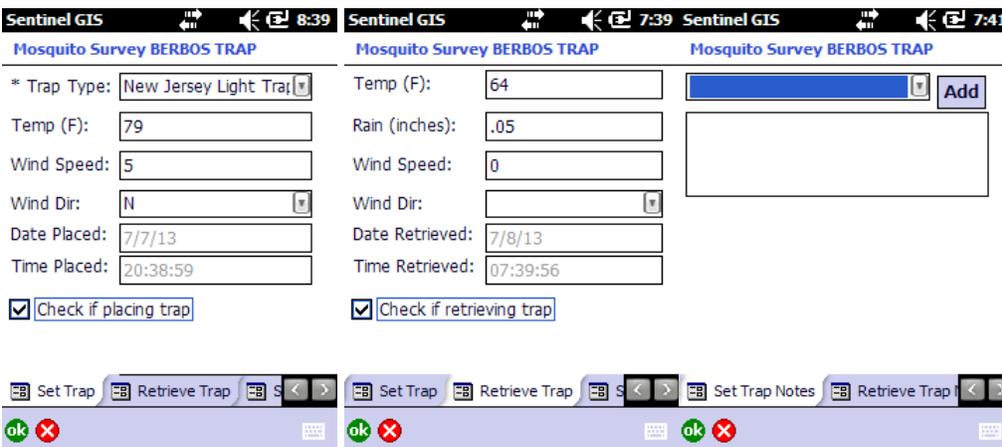
Mosquito Trap Surveys

Select the trap type. All other information on the “Set Trap” page is optional. A trap survey is considered complete if the date and time for “Retrieve Trap” is entered. Completed trap survey records are used to enter mosquito species and abundance information on the desktop (Surveillance Tools). Trap surveys can also be entered on the desktop, as an alternative to recording them in the field.

To record that a trap is being set, check the box “Check if placing trap.” The current date and time are entered. Optionally enter weather information. Additional notes can be recorded on the “Set Trap Notes” page. To enter notes, select a note from the drop-down and press Add, or type in notes.

If a trap was set previously, the “Set Trap” information will already be filled in.

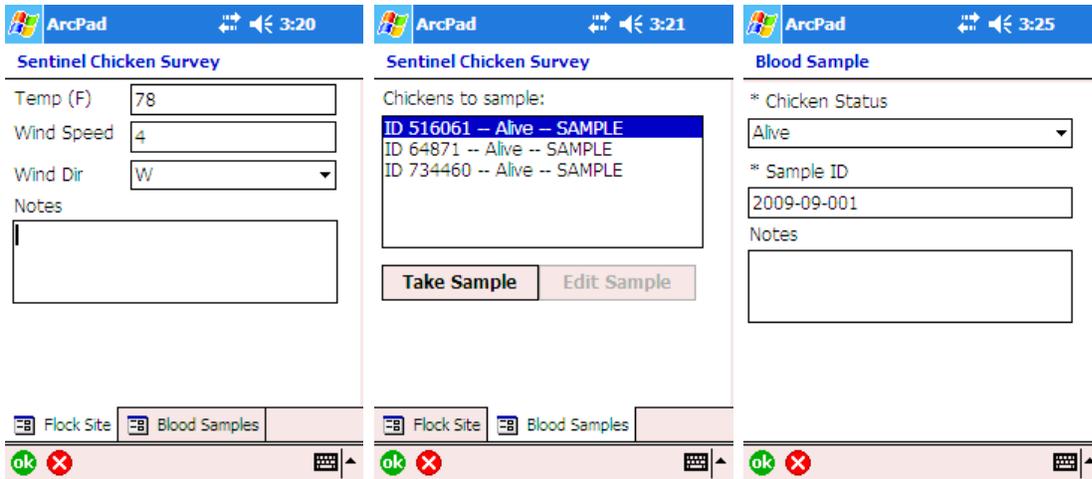
To record that a trap is being retrieved, go to the “Retrieve Trap” page and check the box “Check if retrieving trap.” The current date and time are entered. Optionally enter weather information. Additional notes can be recorded on the “Retrieve Trap Notes” page. To enter notes, select a note from the drop-down and press Add, or type in notes.



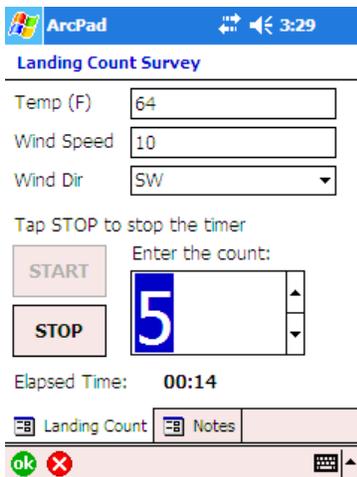
Sentinel Chicken Flock Surveys

Optionally enter the weather information and notes.

Tap the Blood Samples tab. All 'Active' chickens will be listed to sample. Tap 'Take Sample', and enter blood sample details. Chicken status and Sample ID are required.

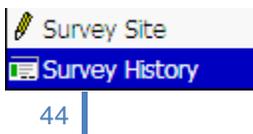


Landing Count Surveys



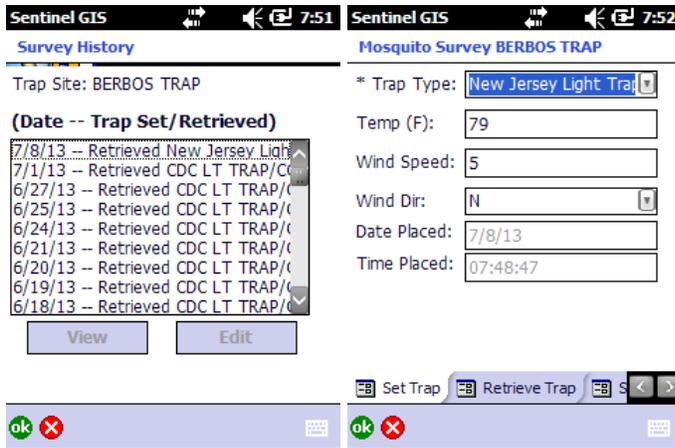
Accessing Survey History

Select a site, then tap the Survey History button.



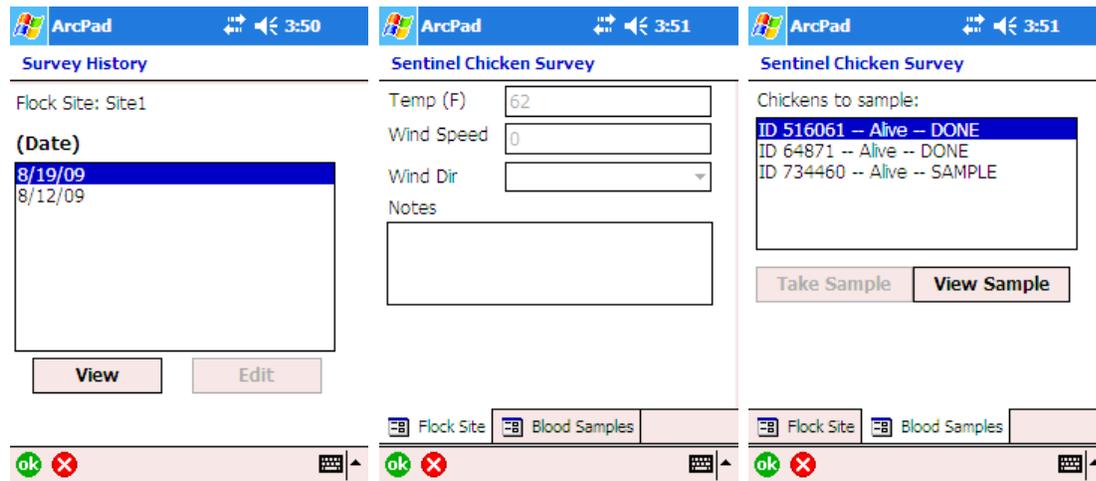
Mosquito Trap Surveys

Surveys are listed in date order. Select a survey record to view or edit it. Only surveys from the current day will be editable.



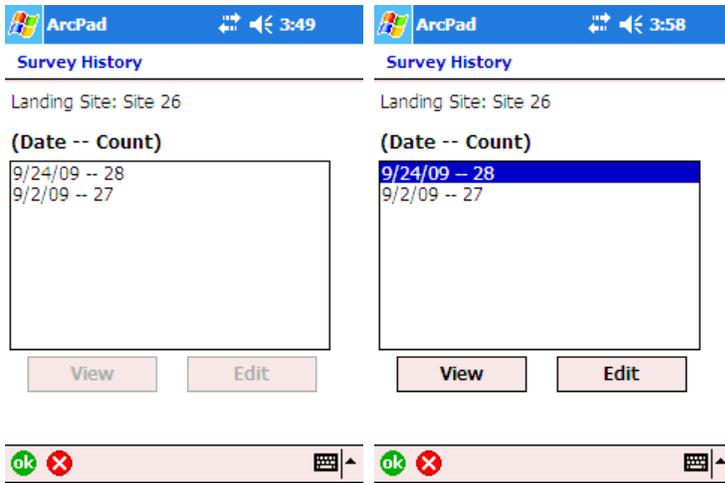
Sentinel Chicken Flock Surveys

Surveys are listed in date order. Select a survey record to view or edit it. Individual samples will be listed. Select a sample to view or edit it. Only surveys and samples from the current day will be editable.



Landing Count Surveys

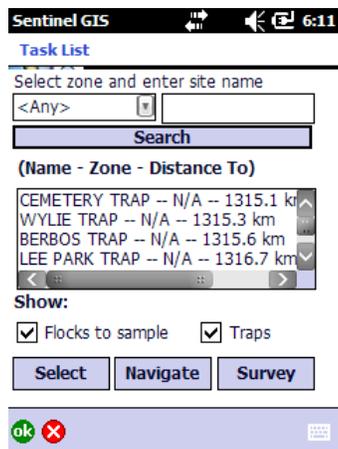
Surveys are listed in date order. Select a survey record to view or edit it. Only surveys from the current day will be editable.



Using the Task List/Find Utility

The task list is used to search for sites that require some action. Search criteria include:

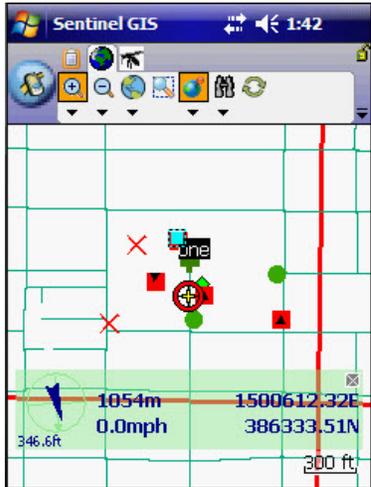
1. Zone number
2. Site name (partial matches are supported)
3. Action
 - a. Flocks to sample
 - b. Traps



Results are listed by distance. Those sites that are closest to the current GPS position (or the center of the map if there is no GPS position) are listed first. These values are updated if the Task List is closed and reopened.

After finding sites that meet your criteria, take one of the following actions:

1. Select. This selects the site and zooms to it on the map.
2. Navigate. This makes the selected site the Navigation target. Navigation directions are displayed in the ArcPad GPS Position Window (Compass tab), and in the GPS dashboard while viewing the map.



3. Survey. This opens the survey form.

Working with Service Requests

If you have purchased the Service Request module, service requests will also be available in Surveillance.

The service request toolbar contains two tools.

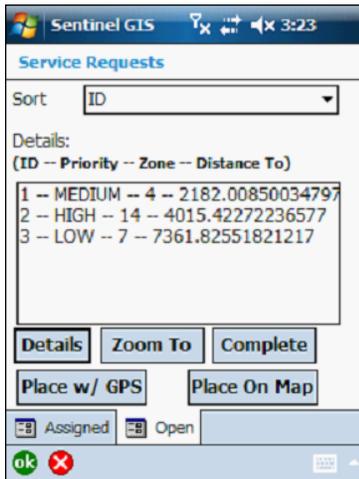
1. View Service Requests. Tap this button to view all service requests that are open, or assigned to you.

2. Identify Service Request. Tap this tool, then tap a service request in the map to view details for it.

View Service Requests

The Service Request dialog contains tools for viewing, sorting, locating, and completing service requests that are assigned to the technician or that are open (unassigned).

Press the View Service Requests button to open the dialog.



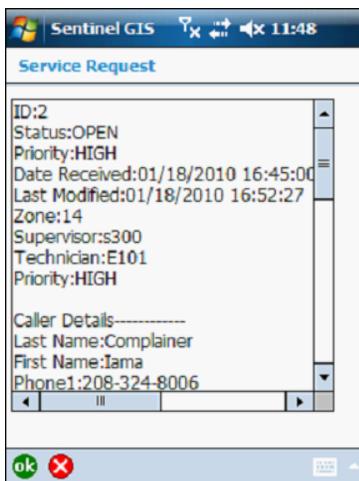
Sort Requests

The Assigned tab shows the Service Requests assigned to the technician currently logged in. They are sorted by Service Request ID, but can also be sorted by Priority, Zone, or Distance. **Please Note:** The distance is displayed in the coordinate units of the ArcPad map. If a service request has not been geocoded or placed on the map, the distance will be calculated from the current location to 0,0 and so may display as a large number.



View Details

Select a Service Request and press 'Details.' All information entered for the request is visible, but can't be modified. Click OK to close the details and return to the Service Request screen.



Zoom To

To zoom to the location of a geocoded Service Request, highlight the request and click Zoom To.

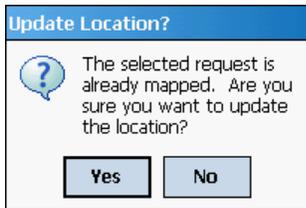
Place Service Request

If the Service Request is in the wrong location on the map, or was not geocoded, it can be placed on the map using GPS, or manually.

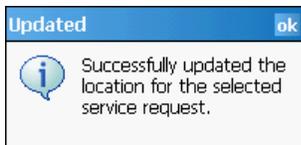
To place the Service Request in your current GPS location, highlight the request in the list and select 'Place w/ GPS.' Ensure you have a valid GPS location and that the GPS receiver is located where you want the Service Request placed.

To place the Service Request on the map manually, first zoom to the location on the map where it will be placed. Then, open the Service Requests dialog. Highlight the request to be placed then press the 'Place on Map' button. Click the map location where the Service Request should be located.

If the Service Request has already been geocoded and is being updated, you will be asked to confirm.

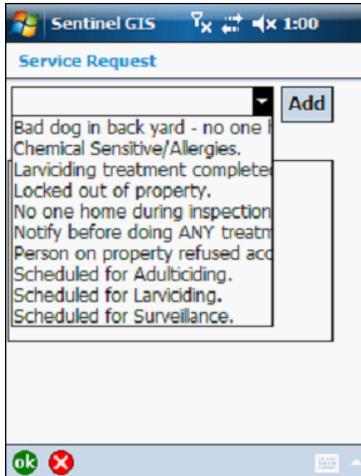


When the location is updated successfully a dialog will display. Press OK to dismiss it.

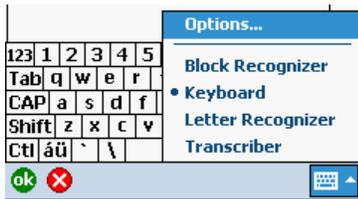


Complete Service Request

Select the Service Request and press Complete. Enter field notes by selecting from the list and pressing Add. The list of pre-built field notes is configured in ArcMap, in the Service Request Configuration Utility.



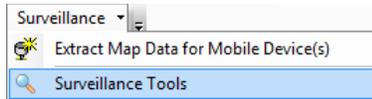
Additional notes can be entered by clicking in the Notes text box and using the keyboard, transcriber, or any other input method supported by the mobile device.



Press OK to save the field notes and complete the Service Request.

Surveillance Tools

Desktop Surveillance tools are accessed in ArcMap, from the Surveillance toolbar.

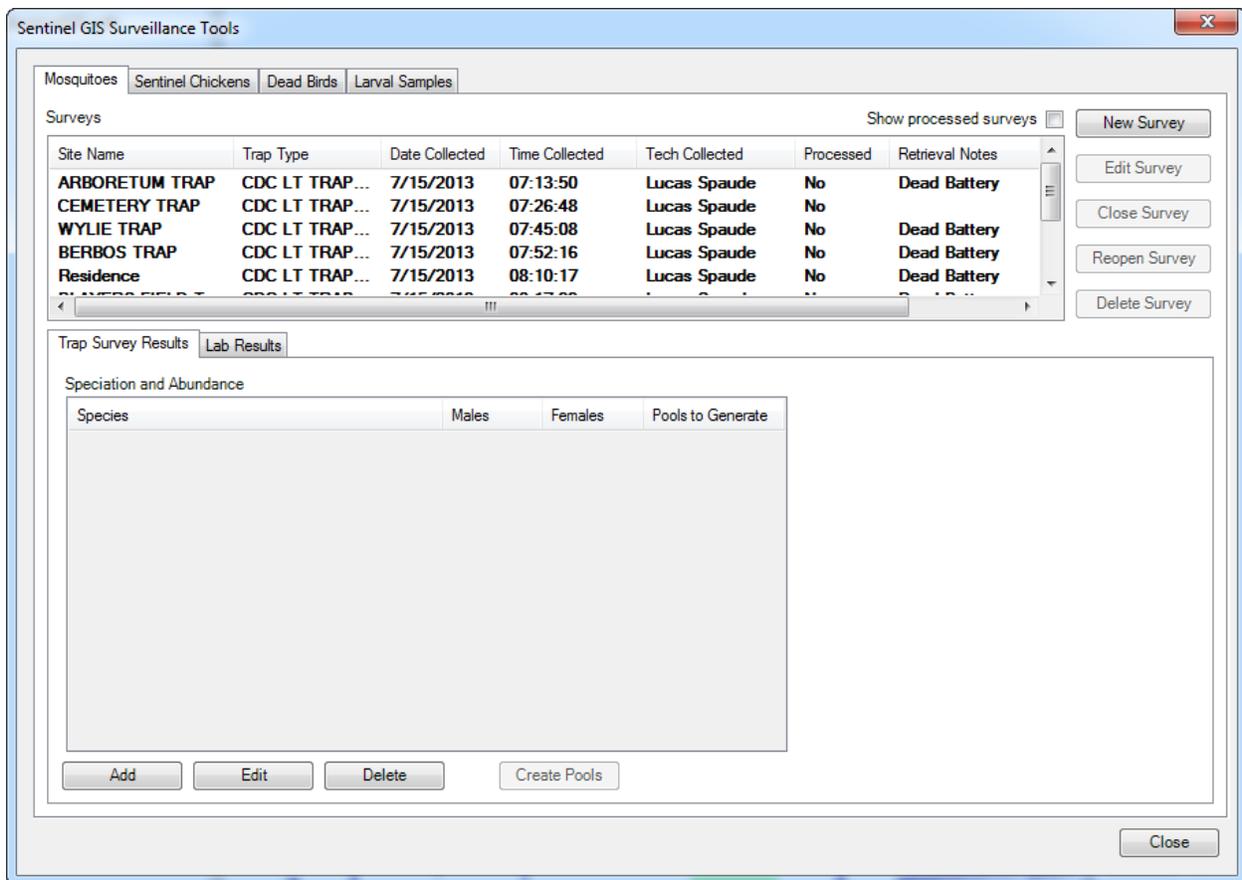


Mosquito trap results are processed. Speciation and abundance data are entered and mosquito pools are created. Pools are sent to labs for testing, and disease results are entered.

Sentinel chicken blood samples and dead bird samples are sent to labs for testing, and disease results are entered.

Mosquitoes

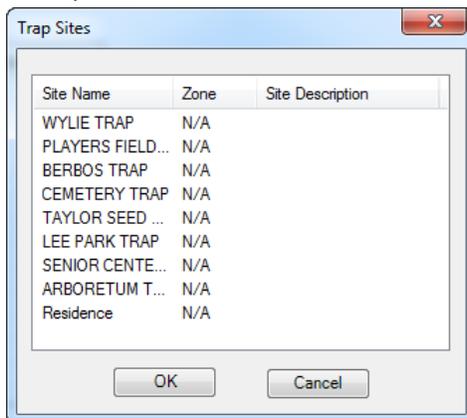
After trap site surveys are received from handheld devices and merged to the database, all 'Trap Retrieved' surveys not yet processed will be available. New surveys can be created, and existing surveys can be edited or deleted. Click 'Show processed surveys' to show all surveys, including surveys that are closed. Surveys that have speciation and abundance data entered will display in bold text.



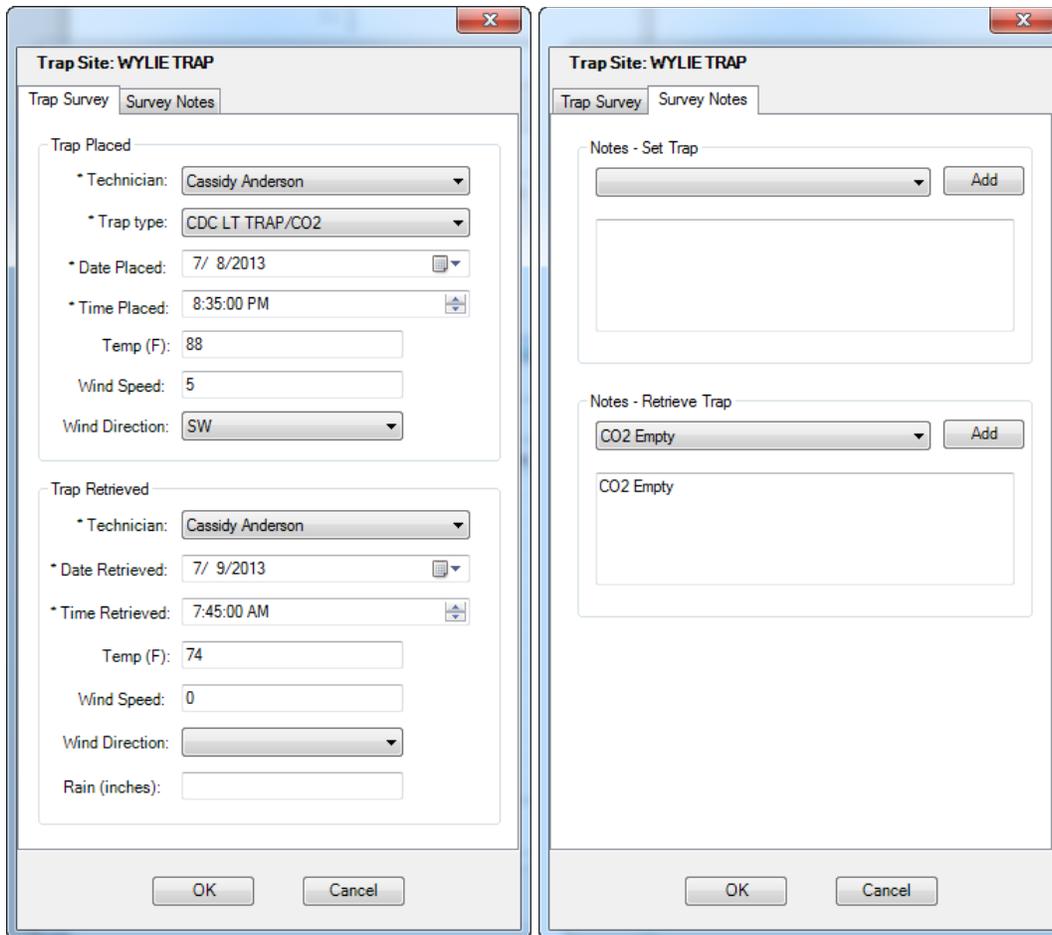
If no speciation and abundance data will be entered for a survey, select it and click Close Survey. To re-open a survey, select it and click Reopen Survey.

Create/Edit/Delete Surveys

Click New Survey to enter trap set/retrieve details on the desktop. Select the trap site to create the survey for, then click OK.

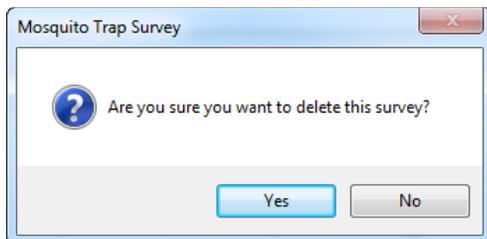


Enter trap type and other details, including notes (optional), and press OK.



To edit an existing survey, select it from the list then press Edit Survey. Make changes as needed then press OK.

To delete an existing survey, select it from the list then press Delete Survey. You will be prompted to confirm this action. Only one survey can be deleted at a time.



Enter Speciation/Abundance Data

1. Select a survey from the list. Press the Add button to enter a species count.

- The Pool Editor displays. Pools can be edited or deleted. Pools can also be added if there are remaining mosquitoes yet to be pooled.

Mosquitoes Remaining (not assigned to pools)

Species	Females

Pools

Pool ID	Species	Females	Lab	DateSent	Sent By
12d587e...	Cx. pipiens	50	State Health Lab	9/23/2009	Shaun Smith
d6bcc22...	Cx. pipiens	17	State Health Lab	9/23/2009	Shaun Smith
f8f1f6f9-d...	Cx. quinquefasciatus	12	State Health Lab	9/23/2009	Shaun Smith

Buttons: Add, Edit, Delete, Delete All, Print Pool Submission Form, Print Pool Labels, Close

- labels, 8 ½ x 11 portrait page size.
- When finished, press Close. Once pools are sent to a lab, the survey will not be editable.

Enter Lab Results

- Select a survey that has been submitted to a lab. Click on the Lab Results tab.
- Select one or more pools to enter lab results for (Ctrl + select or Shift + select), then press Edit Results.

Sentinel GIS Surveillance Tools

Mosquitoes Sentinel Chickens Dead Birds Larval Samples

Surveys Show processed surveys

Site Name	Trap Type	Date Collected	Time Collected	Tech Collected	Processed	Retrieval Notes
Residence	CDC LT TRAP...	7/15/2013	08:10:17	Lucas Spaude	No	Dead Battery
PLAYERS FIELD T...	CDC LT TRAP...	7/15/2013	08:17:33	Lucas Spaude	No	Dead Battery
TAYLOR SEED TRAP	CDC LT TRAP...	7/15/2013	08:33:36	Lucas Spaude	No	Dead Battery
SENIOR CENTER T...	CDC LT TRAP...	7/15/2013	08:46:54	Lucas Spaude	No	Dead Battery
LEE PARK TRAP	CDC LT TRAP/CO2				No	

Buttons: New Survey, Edit Survey, Close Survey, Reopen Survey, Delete Survey

Trap Survey Results Lab Results

Pool ID	Species	Females	Lab	Test Method(s)	Diseas
4658c8a8-f701-4c87-9876-d614eecd0b71	Cx. tarsalis	16	SD Public Health ...	PCR	West

Buttons: Edit Results, Close

3. In the Edit Lab Results window, enter the date received, date tested, lab tech name, and optionally a confidence value and notes. Select one or more test methods (Ctrl + select or Shift + select). Select the disease(s) tested for. If disease positives were reported, select one or more diseases; or if no diseases were reported select none. Click OK.

The screenshot shows the 'Edit Lab Results' window with the following data:

Field	Value
Date Received	Wednesday, July 24, 2013
Date Tested	Wednesday, July 24, 2013
Lab Tech Name	
Confidence	0
Notes	

Test Methods	Disease(s) Tested For	Disease(s) Positive
PCR	West Nile virus	Encephalitis
RAMP	Encephalitis	None Present
VecTest	None Present	West Nile virus

Closing Surveys

Close a survey after all desired information has been recorded. If species counts are all that are recorded, close the survey after entering that information. If testing is performed, close the survey after test results are entered. Closing the survey removes it from the list that displays when you first open Surveillance Tools. All the information recorded for surveys is still accessible via reports and map data.

Chickens

After flock surveys have been received from handhelds and merged to the database, all unprocessed samples from sentinel chickens will be available for processing. Click 'Show processed surveys' to show all.

If no samples will be sent to labs for testing, select a survey and press 'Close Survey.'

Notes can be entered or edited for chickens or blood samples.

Sentinel GIS Surveillance Tools

Mosquitoes | Sentinel Chickens | Dead Birds

Surveys Show processed surveys Edit Flocks

Site Name	Flock Name/ID	Survey Date	Processed
Site10	Flock 26556	8/29/2009	No
Site10	Flock 26556	8/15/2009	No
Site8	Flock 38470	9/4/2009	No

Close Survey
Reopen Survey

Flock Survey Results | Lab Results

Blood Sample ID	Chicken Code/ID	Status	Active	Lab	Date Sent	Sent By
Fake Sample 1554	ID 69597	Alive	Yes			

Chicken Notes: Update

Blood Sample Notes: Update

Send Selected Samples to Lab Print Submission Form Print Labels

Close

Process Samples

If samples from sentinel chicken surveys will be sent to a lab for testing, select the flock survey first, then select the samples that will be sent. Lab submission forms and labels can be printed. Labels are formatted for 2" x 4" labels, 8 1/2 x 11 portrait page size.

Chicken status can also be changed by right-clicking a blood sample record.

Flock Survey Results | Lab Results

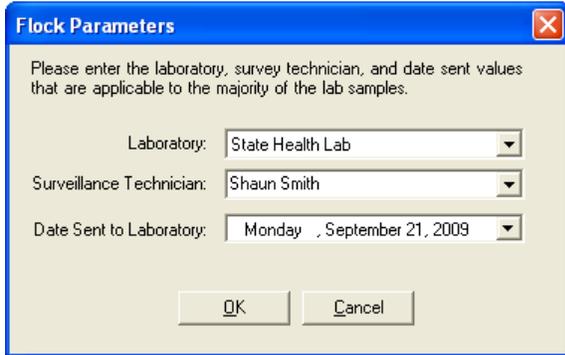
Blood Sample ID	Chicken Code/ID	Status
Fake Sample 1554	ID 69597	Alive

- Alive
- Appears Sick
- Dead
- Missing

Chicken Notes:

Send to Lab

Click 'Send Selected Samples to Lab.' Enter the laboratory, technician, and date sent. Click OK.



Flock Parameters

Please enter the laboratory, survey technician, and date sent values that are applicable to the majority of the lab samples.

Laboratory: State Health Lab

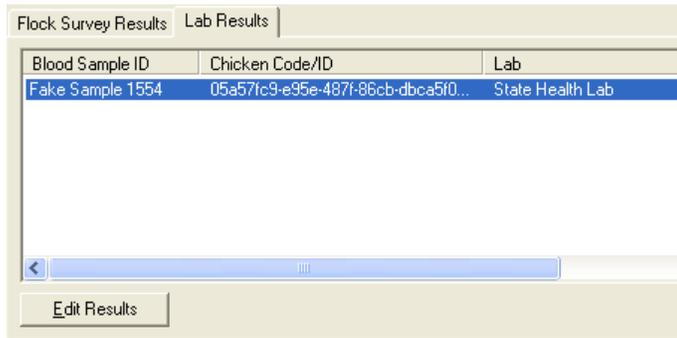
Surveillance Technician: Shaun Smith

Date Sent to Laboratory: Monday, September 21, 2009

OK Cancel

Enter Lab Results

1. When lab results are received, select the flock survey first, then click the Lab Results tab. Select the sample(s) to enter lab results for, then click 'Edit Results.'



Flock Survey Results Lab Results

Blood Sample ID	Chicken Code/ID	Lab
Fake Sample 1554	05a571c9-e95e-4871-86cb-dbca5f0...	State Health Lab

Edit Results

2. Enter the date results were received, the date tested, lab tech name, and optionally a confidence value and notes. Select one or more test methods. Select the disease(s) tested for. If the sample(s) tested positive for any disease(s), select one or more diseases. Click OK.

Edit Lab Results

Date Received: Wednesday, July 24, 2013

Date Tested: Wednesday, July 24, 2013

Lab Tech Name:

Confidence:

Notes:

Test Methods	Disease(s) Tested For	Disease(s) Positive
PCR RAMP VecTest	West Nile virus Encephalitis None Present	Encephalitis None Present West Nile virus

Clear Clear Clear

OK Cancel

Dead Birds

After dead bird locations have been entered on the desktop or received from handhelds and merged to the database, samples can be created and sent to labs, and lab results entered. If a dead bird will not be tested, select it and press 'Close Entry.' Click 'Show processed entries' to view all.

Date Collected	Time Collected	Zone	Species	Sex	Condition	Processed	Address
9/3/2009		SE	Crow	F	Dying	No	235 N. Lincoln, Je
9/3/2009		zone2	Crow	M	Dead Usable	No	
9/3/2009		zone1	Raven	M	Dead Usable	No	
9/3/2009		zone3	Blue Jay	M	Dead Usable	No	
9/2/2009		zone2	Blue Jay	M	Dead Usable	No	
9/2/2009		zone2	Crow	M	Dying	No	
9/1/2009		zone1	Raven	F	Dying	No	
8/31/2009		zone1	Crow	F	Dead Usable	No	
8/29/2009		zone2	Crow	F	Dying	No	
8/29/2009		zone2	Blue Jay	M	Dying	No	
8/28/2009		zone2	Crow	M	Dying	No	
8/28/2009		zone2	Blue Jay	M	Dying	No	
8/27/2009		zone2	Crow	F	Dying	No	
8/26/2009		zone3	Raven	M	Dead Usable	No	
8/25/2009		zone2	Blue Jay	F	Dead Usable	No	
8/25/2009		zone2	Raven	M	Dying	No	

Add Samples

1. Select a dead bird from the list and press Add Sample.
2. Enter a sample ID. Press OK

Please enter a sample ID:

WCM-09-B-001

OK Cancel

Send to Lab

1. Select one or more samples and press 'Send Selected Samples to Lab.' Lab submission forms and labels can be printed. Labels are formatted for 2" x 4" labels, 8 ½ x 11 portrait page size.

Dead Bird Survey Results | Lab Results

Add Sample Edit Sample Delete Sample

Swab Sample ID	Lab	Date Sent	Sent By
WCM-09-B-001			

Notes: Update

Send Selected Samples to Lab Print Submission Form Print Labels

- 2.

Dead Bird Parameters

Please enter the laboratory, survey technician, and date sent values that are applicable to the majority of the selected dead bird samples.

Laboratory: State Health Lab

Surveillance Technician: Shaun Smith

Date Sent to Laboratory: Wednesday, September 09, 2009

OK Cancel

Enter Lab Results

1. After lab results are received, select the dead bird entry, then click the Lab Results tab. Select sample(s) then click Edit Results.

Dead Bird Survey Results | Lab Results

Swab Sample ID	Lab
WCM-09-B-001	State Health Lab

Edit Results

2. Enter the date results were received, the date tested, lab tech name, and optionally a confidence value and notes. Select one or more test methods. Select the disease(s) tested for. If the sample(s) tested positive for any disease(s), select one or more diseases. Click OK.

Edit Lab Results

Date Received: Wednesday, July 24, 2013

Date Tested: Wednesday, July 24, 2013

Lab Tech Name:

Confidence:

Notes:

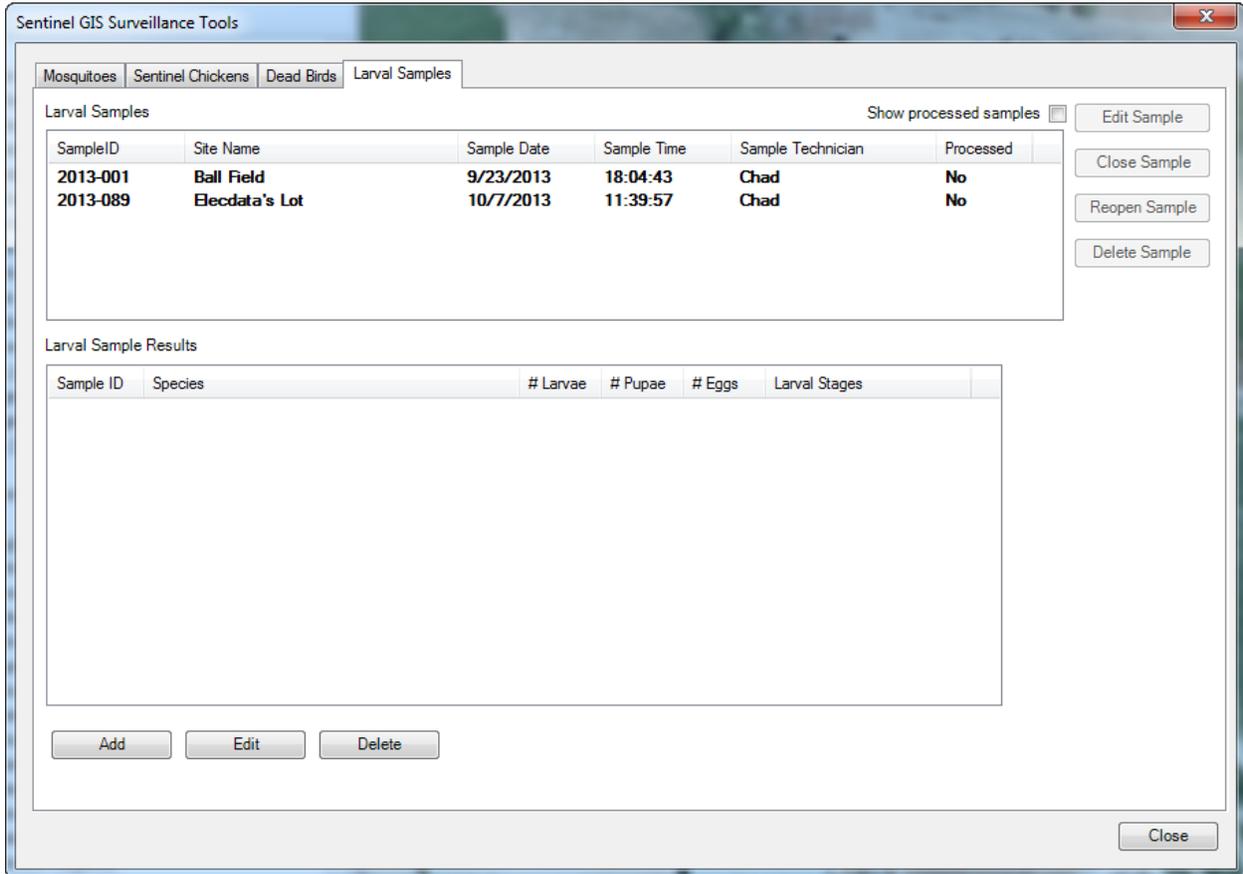
Test Methods	Disease(s) Tested For	Disease(s) Positive
PCR	West Nile virus	Encephalitis
RAMP	Encephalitis	None Present
VecTest	None Present	West Nile virus

Clear Clear Clear

OK Cancel

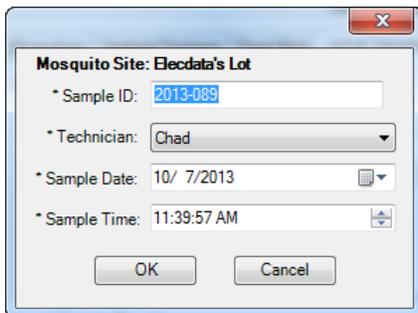
Larval Samples

If Larviciding is installed and the option to record larval samples during inspection is enabled, larval samples can be recorded using the Larviciding mobile tools. If samples have been recorded, they will be displayed on this tab. Field species identification information can be reviewed, and lab identification information can be entered. After a sample has been completely identified, select it and press 'Close Entry.' Click 'Show processed entries' to view all.



Edit/Delete Samples

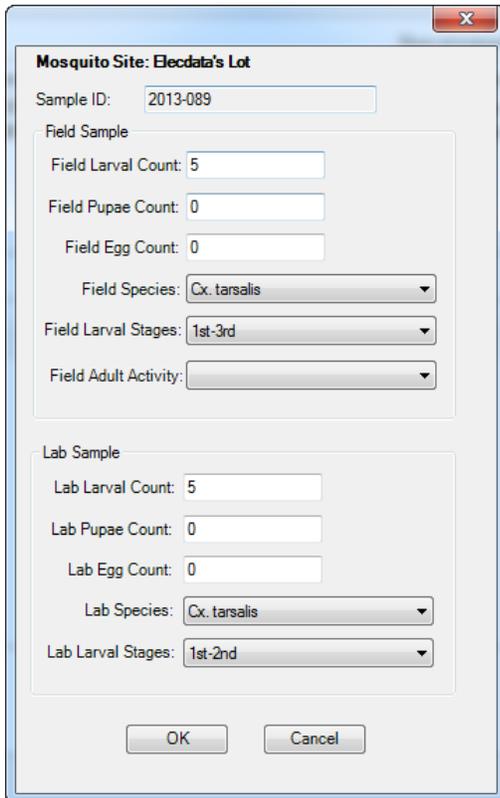
Select a sample then press Edit Sample.



To delete, select a sample then press Delete Sample. Confirm your choice.

Enter Speciation and Abundance Data

Field species identifications can be viewed and edited, and lab identification information entered. Select a Larval Sample Result and press Edit. Enter information as required then press OK.



The image shows a software dialog box titled "Mosquito Site: Elecdada's Lot". It contains two main sections: "Field Sample" and "Lab Sample".

Field Sample:

- Sample ID: 2013-089
- Field Larval Count: 5
- Field Pupae Count: 0
- Field Egg Count: 0
- Field Species: Cx. tarsalis
- Field Larval Stages: 1st-3rd
- Field Adult Activity: (empty dropdown)

Lab Sample:

- Lab Larval Count: 5
- Lab Pupae Count: 0
- Lab Egg Count: 0
- Lab Species: Cx. tarsalis
- Lab Larval Stages: 1st-2nd

At the bottom of the dialog box are two buttons: "OK" and "Cancel".

To add more species identification records, press New. Fill in the information then press OK.

Close Sample

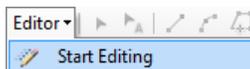
Close a sample after all desired information has been recorded. Closing the sample removes it from the list that displays when you first open Surveillance Tools. All the information recorded for samples is still accessible via reports and map data.

Editing Surveillance Data in ArcMap

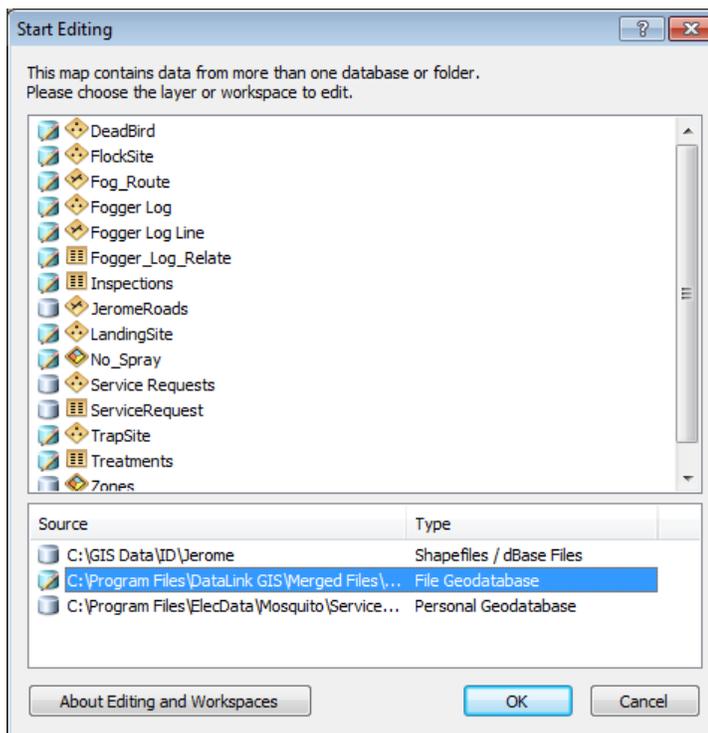
All editing is performed with standard ArcMap editing tools.

Create New Features

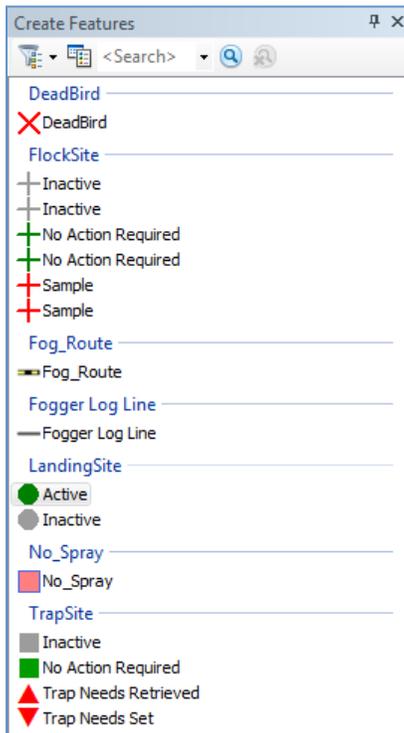
1. Click Editor > Start Editing. If the Editor toolbar is not displaying, turn it on by clicking View > Toolbars > Editor.



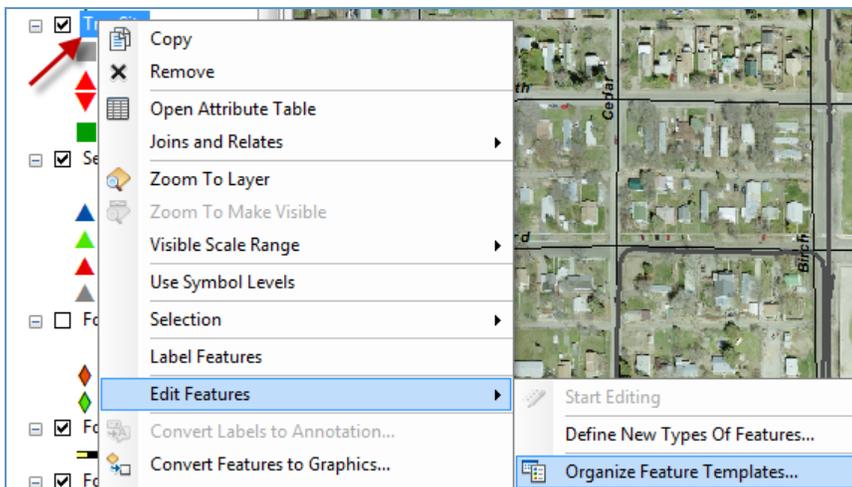
2. If some map data exists in other locations besides your SentinelGIS geodatabase, you will be prompted to select your edit workspace. Select the geodatabase and start editing.



3. In the Create Features dialog, select the feature you'd like to create (DeadBird, FlockSite, LandingSite, or TrapSite).



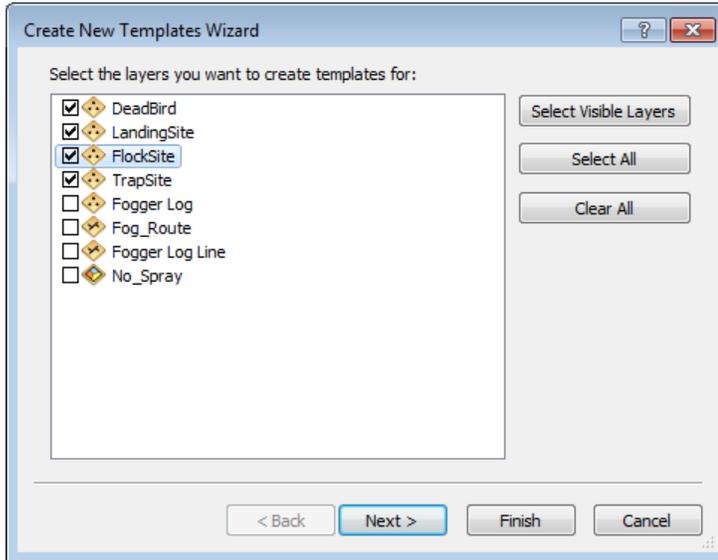
4. If the layer you want to edit does not appear in the Create Features dialog, you must first create an editing template for that layer. Right-click the layer name in the Table of Contents, then select Edit Features > Organize Feature Templates...



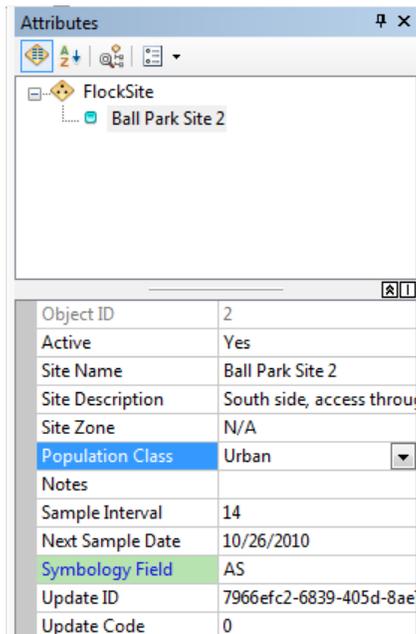
- Click New Template.



- Check the box for each layer you'd like to create a template for, then press Finish.



- Click on the map to add a new feature.
- Enter attributes for the new feature.



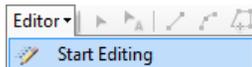
9. When finished adding all new sites, click Editor > Stop Editing. When prompted, save your edits.

Edit Existing Features

Feature attributes and locations can be updated using ArcMap editing tools.

Edit Attributes

1. Click Editor > Start Editing. If the Editor toolbar is not displaying, turn it on by clicking View > Toolbars > Editor.



2. If some map data exists in other locations besides your SentinelGIS geodatabase, you will be prompted to select your edit workspace. Select the geodatabase and start editing.
3. In the Editor toolbar, select the Edit tool, then press the Attributes button.



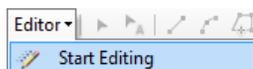
4. Click on a feature to select it. Edit the attributes in the Attributes window.

Object ID	1
Species	Crow
Sex	Male
Condition	Dead Usable
Site Zone	4
Population Class	Urban
Address1	200 Alder
Address2	
City	Jerome
State	ID
Zip	83338
Estimated Date of Death	8/2/2010
Estimated Time of Death	15:00
Technician	Mike
Notes	
Date Collected	8/2/2010
Time Collected	15:20:56
Processed	No
Update ID	9DB898AC-96CC-08CC-{:}
Update Code	0

5. Attributes can also be edited in other ways:
 - a. Open the attribute table and make edits directly in it.
 - b. Use the field calculator to change values for many features at once. (See ArcMap Help for more information on the field calculator.)
6. When finished editing all sites, click Editor > Stop Editing. When prompted, save your edits.

Edit Feature Locations

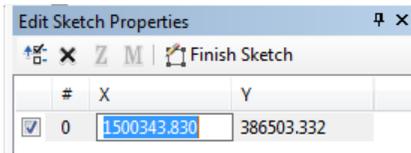
1. Click Editor > Start Editing. If the Editor toolbar is not displaying, turn it on by clicking View > Toolbars > Editor.



2. If some map data exists in other locations besides your SentinelGIS geodatabase, you will be prompted to select your edit workspace. Select the geodatabase and start editing.
3. In the Editor toolbar, select the Edit tool, then press the Sketch Properties button.



4. Select a feature, then click and drag to move it, or double-click it to edit the location manually. Type in the new coordinates for the feature then press Finish Sketch



5. When finished editing all sites, click Editor > Stop Editing. When prompted, save your edits.

Analyzing Surveillance Data

After mapping sites, collecting surveys, and entering surveillance data for species and abundance and disease positives, data can be analyzed by generating map data or running reports.

Generate Map Data

Map data visually and spatially displays the distribution and magnitude of disease reports for mosquitoes, chickens or dead birds, mosquito or bird species, and landing count averages.

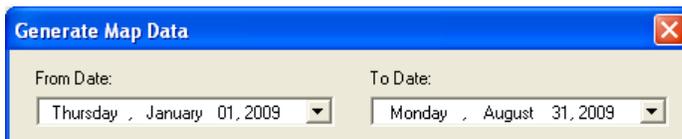
From the Surveillance toolbar, select Generate Map Data.



You will specify criteria for map data generation. Generated map data is added to the current MXD and is also saved in the database.

Specify Selection Criteria for All

Specify a date range for any generated map data.



Mosquitoes

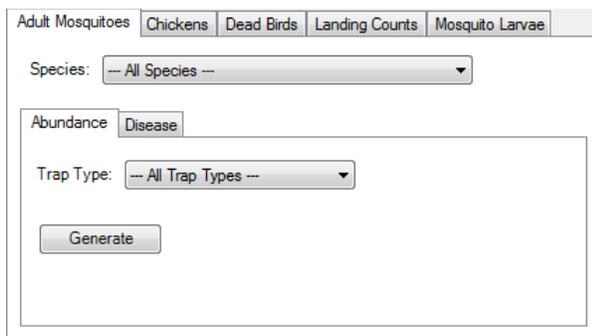
Mosquito surveillance data can be visualized in the following ways.

Abundance

One or all species, one or all trap types. The total number of female mosquitoes will be represented.

Disease

One or all species, one or all diseases. The total number of disease positives will be represented.



Specify your criteria, then press Generate. If no data matches the criteria, the program will tell you so. Otherwise, generated map data will be added to your map Table of Contents.



If you would like to change symbology, you can do so using standard ArcMap tools.

Chickens

Chicken surveillance data can be visualized by one or all diseases. The total number of disease positives will be represented by the map data.

Dead Birds

Dead bird data is already represented on the map. However, generated map data can be visualized in the following ways.

Species

One or all species. The total number of birds will be represented.

Disease

One or all diseases. The total number of disease positives will be represented.

Landing Counts

Data can be visualized by average landing count. No options need to be specified other than date range.

Mosquito Larvae

Data can be visualized by one or all species. The total number will be represented on the map.

Create Reports

Reports detail or summarize disease results for mosquitoes, sentinel chickens, or birds; species or abundance information for mosquitoes or birds; and totals and averages for landing counts.

Mosquitoes

There are six mosquito reports.

Abundance Tabular

This report summarizes the total mosquito counts by species and site for the date range selected.

Abundance Zone

This report shows species, trap, and count details for each trap site, grouped by zone and site, totaled by date.

Disease Detail

This report shows each disease occurrence, grouped by disease and zone, for the date range specified.

Disease Summary

This report shows MIR¹ (Minimum Infection Rate) and MLE (Maximum Likelihood Estimate) values for diseases, based on disease results for tested pools, for the date range specified.

Larvae Abundance Tabular

This report summarizes the total larval mosquito counts by species and site for the date range selected.

Larvae Abundance Zone

This report shows larval species count details grouped by zone and site, totaled by date

¹ MIR is computed by grouping data together based on the week the survey was collected. For each grouping, a summation is made of the number of positive pools and the total number of females. THE MIR value for that week is then computed by the number of positive pools / total number of females * 1,000.

Report Criteria

All or Selected Sites

Reports will include data for all sites by default, unless one or more sites are selected first.

Include Inactive Sites

Reports will include only active sites by default. Check the box to include inactive sites.

Filter by Date Range

Specify the date range for the report. If no date filter is set, all dates will be included.

Other Filters

Report data can also be filtered by zone, trap type, species, or disease.

Report Subtitle

Optionally type a subtitle.

Chickens

There are two report types for sentinel chicken flock samples.

Disease Detail

This report shows each disease occurrence, grouped by disease and zone, for the date range specified.

Disease Summary

This report summarizes disease results, grouped by zone, for the date range specified.

The screenshot shows a window titled "Chicken Reports" with a close button in the top right corner. Inside the window, there is a "Select Report Type:" section with a dropdown menu showing "Disease Detail" (highlighted) and "Disease Summary". Below this is the "Report Criteria" section, which includes radio buttons for "All Sites" (selected) and "Selected Sites", and checkboxes for "Include Inactive Sites" and "Filter by Date Range". There are two date pickers labeled "From Date:" and "To Date:", both showing "Tuesday, July 09, 2013". Below these are two empty text boxes labeled "Zone:" and "Disease:". At the bottom, there is a "Report Subtitle (optional):" text box and three buttons: "Generate Report", "Clear Settings", and "Close".

All or Selected Sites

Reports will include data for all sites by default, unless one or more sites are selected first.

Include Inactive Sites

Reports will include only active sites by default. Check the box to include inactive sites.

Filter by Date Range

Specify the date range for the report. If no date filter is set, all dates will be included.

Other Filters

Report data can also be filtered by zone or disease.

Report Subtitle

Optionally type a subtitle.

Dead Birds

There are three dead bird reports.

Abundance Summary

This report summarizes dead bird occurrences by species and zone, for the date range specified.

Disease Detail

This report shows each disease occurrence, grouped by disease and zone, for the date range specified.

Disease Summary

This report summarizes disease results, grouped by zone, for the date range specified.

Dead Bird Reports

Select Report Type:

- Abundance Summary
- Disease Detail
- Disease Summary

Report Criteria

All Locations
 Selected Locations

Filter by Date Range

From Date: Tuesday, July 09, 2013
To Date: Tuesday, July 09, 2013

Zone:

Bird Condition:

Species:

Disease:

Report Subtitle (optional):

Generate Report Clear Settings Close

All or Selected Locations

Reports will include data for all locations by default, unless one or more locations are selected first.

Filter by Date Range

Specify the date range for the report. If no date filter is set, all dates will be included.

Other Filters

Report data can also be filtered by zone, bird condition, species, or disease.

Landing Counts

There are two landing count reports.

Landing Count Detail

This report shows landing count data, grouped by zone and site, for the date range specified.

Landing Count Summary

This report shows graphs summarizing totals and averages, for the date range specified.

Landing Count Reports

Select Report Type:

- Landing Count Detail
- Landing Count Summary

Report Criteria

All Sites

Selected Sites

Include Inactive Sites

Filter by Date Range

From Date: Tuesday, July 09, 2013

To Date: Tuesday, July 09, 2013

Zone:

Report Subtitle (optional):

Generate Report Clear Settings Close

All or Selected Sites

Reports will include data for all sites by default, unless one or more sites are selected first.

Filter by Date Range

Specify the date range for the report. If no date filter is set, all dates will be included.

Other Filters

Report data can also be filtered by zone, bird condition, species, or disease.

Report Subtitle

Optionally type a subtitle.