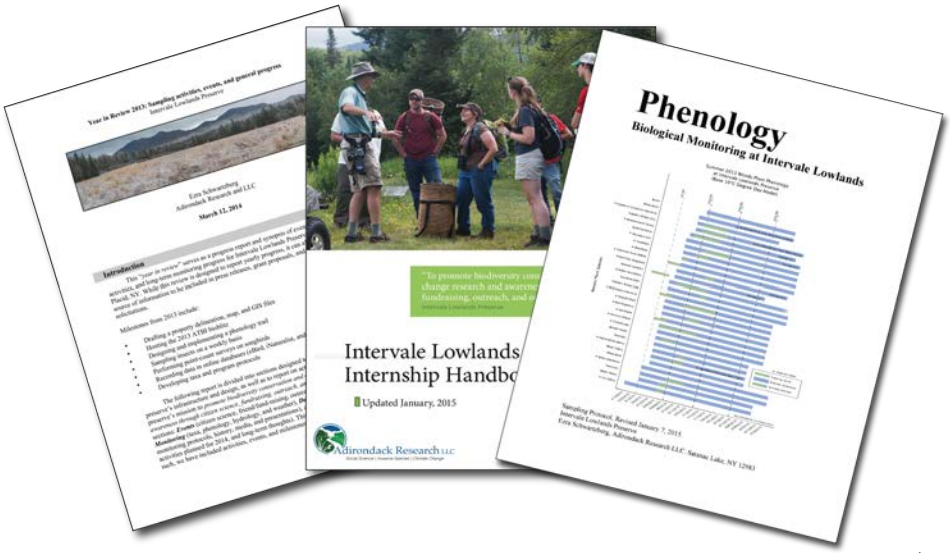
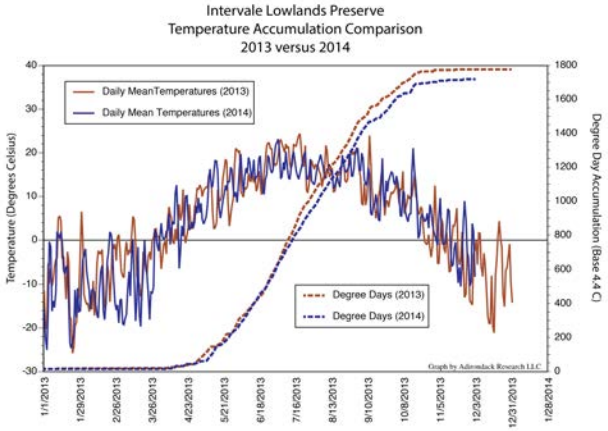
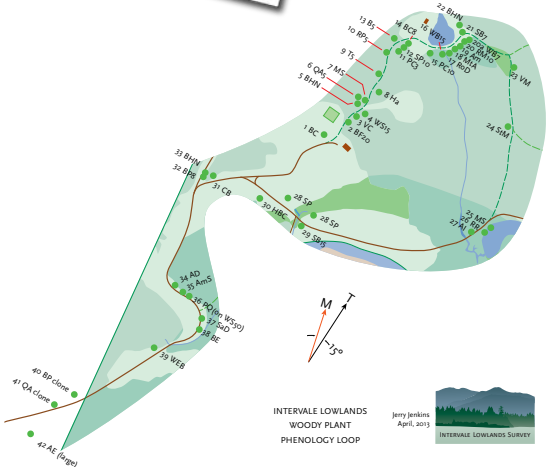
Yearly Analysis and Data Backup

Protocols at Intervale Lowlands Preserve







Sampling Protocol, Revised April 2015.
Intervale Lowlands Preserve
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Overview

This protocol outlines the yearly preliminary analysis and data back-up procedure for the monitoring effort at Intervale Lowlands Preserve. It is necessary to compile a list of backed up data, events and activities, and other items like reports, photos, maps, and lists of findings. The purpose of this yearly compilation is to process data on a regular basis so that it can be easily accessed for grants, award applications, and media packets. This also provides a place to view yearly progress on sampling activities and ecological changes.

This protocol is broken down into four sections: 1) Raw data backup, 2) Preliminary data calculations, 3) other achievable materials, and 4) year end and information backup summary report.

Raw data backup includes all data recorded through data networks (e.g. eBird, iNaturlaist, Nature's Notebook, NestWatch, SiteSage, and RainWise) plus data collected via other sources and stored as Microsoft Excel spreadsheets, BIOTA insect collection database, etc.

Preliminary data calculations include preliminary analyses of temperature data (e.g. degree day calculations), phenology dates of interest (e.g. budbreak, flowering, senesce), snow cover dates extracted from video, as well as pre-calculated information that can be accessed through data networks, including house electric production and NestWatch results.

Other achievable materials include the www.intervlelowlands.org website, photos, time lapse video, GIS and other mapping files, posters and presentation slides, new reports, and the end of year report and summary of backed up files.

The end of year report is a yearly compilation of the year's activities. This includes a list of surveys conducted, raw data archived, preliminary analyses performed, a checklist of backed up and analyzed data, key findings as tables and figures, and a list of press, publications, and events.

Archiving Raw Datasets

We use data networks to collect, store, and share data from our monitoring programs. These datasets follow the formatting of the network from which they are a part of and are in that raw, unanalyzed format. Each data network has it's own format and we simply download and store data in the same format that it is exported. These datasets are used for preliminary analyses (e.g. calculating budbreak dates from Nature's Notebook, number of new species, etc.). Raw datasets also include data collected outside of data networks, such as phenology data on plants not included in the pre-existing list of species from Nature's Notebook, our internal database of insect collections written in BIOTA, Amphibian survey data, and earthworm data. Some of the Raw data is redundant. For example, earthworm data are stored as Excel files but are also entered into iNaturalist and frog data are stored as Excel files but are also entered into Nature's Notebook.

The following subsections of *Archiving Raw Datasets* describe how each dataset is downloaded, named (filename), and stored.

iNaturalist

iNaturalist is used for collecting and storing all species occurrence observations other than birding observations that are collected using eBird, phenology studies, and plant survey data.

Downloading data:

The following is a step by step guide to downloading data in proper format.

1. Point browser to http://www.inaturalist.org/projects/intervale-lowlands-preserve
2. Scroll to bottom of page and select ***csv***
3. Sign in to your user account
4. Complete form requests by leaving sections 1-2 as is and checking off the following for section 3
    a. Basic: Leave as is
    b. Geo: Leave as is
    c. Taxon: Leave as is
    d. Taxon Extras: Select
        i. taxon-class-name
        ii. taxon_order_name
        iii. taxon_family-name
    e. Observation Fields: Select
        i. Field:notes
        ii. field:number of individuals
        iii. field:original collector/ observer
        iv. field:original observer
5. Select ***Export***
6. Choose to be emailed with data query results, or wait for download to appear in window
7. Select ***Download*** in the Export Complete window
8. Locate downloaded zip file and decompress it into a csv file
9. Open file in MS Excel to check that the number of lines of data equal the number of observations in iNaturalist plus 1.

Naming and archiving data file:

All files should be named in a standard format and stored using a specified folder structure. In general the objective for file naming is to keep the original file name given during export, then add a date to the beginning. For example, if an iNaturalist export file is downloaded with the name **observations-4642.csv**, it should be renamed to **150417_observations-4642_inat.csv**, where the date is written as YrMoDa and the file ends with the network name in abbreviation.

Observation data files are all stored under a folder structure (2014 data backup, Data from networks). These folders are stored under an umbrella folder called 2014 Backup), where 2014 is the year and is updated annually.

eBird

eBird is used for archiving all avian data including incidental observations and acoustic point count surveys. Nest box surveys are recorded and downloaded through a different database called NestWatch.

Downloading data:

The following is a step by step guide to downloading data in proper format.

1. Point browser to http://ebird.org/ebird/eBirdReports?cmd=Start
2. Select ***Download Data*** from bottom of page
3. Sign in with username and password
4. Select ***Request Access*** under Basic Dataset (EBD)
5. Fill out the request form with the following information
    a. Organization: Intervale Lowlands Preserve
    b. Project Title: Avian Monitoring Program
    c. Project Type: General
    d. Abstract: We monitor birds on Intervale Lowlands Preserve throughout the year with incidental observations and acoustic point count surveys. At the end of each year we download our data and store it in our own backup file. Every few years we perform analyses on these data.
6. Check of terms of use acceptance
7. Select ***Submit Request***
8. Wait for email from eBird
9. Once email is received, visit http://ebird.org/ebird/data/download from your browser to get started
10. Select Basic Dataset (EBD)
11. Under Custom Download sect the following
    a. all species
    b. choose region, then type in Essex and choose Essex, NY, United States (US)
    c. Choose date range (January - January, last year to this year
    d. Select include unvetted data
12. Select Make Request
13. Wait for email with download link
14. Open email and download linked .zip file
15. Decompress and open .txt file for main dataset in Excel
16. Save as 150420_eBird.xls

Sorting data:

The data file downloaded from eBird contains data for all of Essex County. All other sites in the county need to be deleted from the sheet to leave the Intervale Lowlands site records. Intervale Lowlands Preserve's Locality name is Intervale Lowlands Preserve.

1. Scroll down to first Intervale Lowlands Preserve record.

2. Select cell directly above first record
3. Hold down shift and select the first cell on the sheet
4. Delete lines above Intervale Lowlands Preserve
5. Repeat procedure for cells occurring after Intervale Lowlands Preserve and delete
6. Save file as **150418_eBird.xls**, where the date is written as YrMoDa and the file ends with the network name.
7. Archive file under folder (2014 data backup, Data from networks)

Phenology Trail - Nature's Notebook

Nature's Notebook is used for collecting archiving all plant phenology data, excluding amphibian monitoring and nest box surveys. Nature's Notebook collected data include 60+ trees and shrubs along the phenology trail and five flowering plants (goldenrod, joe pye, milkweed, thyme, lupine) included in bee sweepnet surveys. This download procedure is for plants on the phenology trail and does not include download instructions for anuran call surveys. That is in a separate section.

Downloading data:

The following is a step by step guide to downloading data in proper format.

1. Point browser to https://www.usanpn.org/results/data
2. Select ***Raw Data***
3. Check off the following optional fields
    a. ObservedBy person ID
    b. Submission ID
    c. SubmittedBy Person
    d. Submission Datetime
    e. Partner Group
    f. Site Name
    g. Protocol ID
    h. Observaiton Group ID
4. Enter Start and End Dates (Jan 1-Decemebr 31 for the past year)
5. Select NY
6. Do not make any restrictions for species, phenophases, or partner groups
7. There is not need to download ancillary data sheets
8. Enter email address
9. Select ***Download Data***
10. Wait for file download (called datasheet.zip)
11. Decompress zip file and open up **observation_data.csv**

Sorting data:

The data file downloaded from Nature's Notebook contains data for all of New York State. All other sites in NY need to be deleted from the sheet to leave the Intervale Lowlands site records. Intervale Lowlands Preserve's site ID is 9044 and all records are pre-sorted in order of site ID.

8. Scroll down to first 9044 record.
9. Select cell directly above first record
10. Hold down shift and select the first cell on the sheet
11. Delete lines above 9044
12. Repeat procedure for cells occurring after 9044 and delete
13. Save file as **150418_observation_data_NN.xls**, where the date is written as YrMoDa and the file ends with the network name in abbreviation.
14. Archive file under folder (2014 data backup, Data from networks)

Anuran Call Surveys - Nature's Notebook

Downloading data:

The following is a step by step guide to downloading data in proper format.

12. Point browser to https://www.usanpn.org/results/data
13. Select ***Raw Data***
14. Check off the following optional fields
    a. ObservedBy person ID
    b. Submission ID
    c. SubmittedBy Person
    d. Submission Datetime
    e. Partner Group
    f. Site Name
    g. Protocol ID
    h. Observation Group ID
    i. Observation comments
15. Enter Start and End Dates (Jan 1-Decemebr 31 for the past year)
16. Select NY
17. Select amphibian as functional group
18. Do not make any restrictions for species, phenophases, or partner groups
19. Choose NY and NY Phenology Project, then select Intervale Lowlands Preserve
20. There is not need to download ancillary data sheets
21. Enter email address
22. Select ***Download Data***
23. Wait for file download (called datasheet.zip)
24. Decompress zip file and open up **observation_data.csv**
25. Save file as **150418_Anuran_calls_NN.xls**, where the date is written as YrMoDa and the file ends with the network name in abbreviation.
26. Archive file under folder (2014 data backup, Data from networks)

NestWatch

NestWatch is used to collect, store, and analyze nestbox data on the preserve. We currently use this platform to record nesting observations for eastern bluebird, tree swallow, and merganser.

Downloading data:

The following is a step by step guide to downloading data in proper format.

1. Point browser to http://nestwatch.org/explore-data/
2. Select ***Your Data*** form dropdown menu
3. Login
    a. Username: intervalelowlands
    b. Password: birding4ever
4. Scroll to bottom of the Your Data page
5. Under Download Breeding Data select
    a. All nest sites
    b. Last years date
    c. Individual site visits
    d. Excel
6. Select ***Download Now***
7. Download Site Description and Species Summaries, then combine sheets from these two worksheets into the original Excel table (Breeding Data) so that all sheets are in same document.
8. Save as 141008_NestWatch.xls
9. Archive file under folder (2014 data backup, Data from networks)

Other Phenology Data

Data on phenology of plants not included in nature's Notebook are stored as a separate Excel file.

Downloading data:

1. The data for these observations is not downloaded because it does not come form a shared network. Simply save the phenology file as 150420_nonNN_Intervale_Phenology. Archive file under folder (2014 data backup, Self-stored data)

House Electric Usage and Production

SiteSage is used to collect, store, and analyze house electric data for both the main house and the guest house.

Downloading data:

The following is a step by step guide to downloading data in proper format.

1. Point browser to https://sitesage.net/index.php
2. Login
    a. Username: [ask Larry]
    b. Password: [ask Larry]

3. Select Report Card
4. Select ***Export Data*** from bottom of browser window
5. Choose date range for entire year
6. Open in Excel
7. Switch location to Farmhouse and repeat steps 4-6
8. Combine both files in a single Excel sheet
9. Save as 150420_yeardata_SiteSage.xlsx
10. Archive file under folder (2014 data backup, Data from networks)

Weather Station

RainWise.net the main weather recording and reporting platform that we use at Intervale Lowlands. In addition to RainWise.net, we use a few other services that perform preliminary analyses on our data, or that have web-based interpretations of weather data that we collect. The auxiliary platforms include NEWA (Cornell's Network for Environment and Weather Applications, Wind Alert, AWEKAS, PWS, and Weather Underground.

Downloading data:

The following is a step by step guide to downloading data in proper format.

1. Point browser to https://rainwise.net/weather/larry12946
2. Select Download
3. Enter dates do download data from 1/1/YEAR to 12/31/YEAR
4. Selected Export
5. Save as 150420_yeardata_RainWise.xlsx

Snow Monitoring Camera

We record snowcover, including first date of continuous snow cover and and last date of snow cover at a single site on the Upper Loop Trail. The camera takes a single image every 24 hours at 12:00PM.

Downloading data:

The following are instructions to downloading camera card data and measuring snow level.

1. Press main button on time lapse camera
2. Turn camera off and extract memory card
3. Place card in computer or card reader and copy files to a data storage directory
4. Open files in QuickTime viewer
5. Pause video and move slider from one day to the next
6. Record snow level in Microsoft Excel
7. Save as 150420_yeardata_Snowcover.xlsx

PhenoCam Monitoring Camera

We have a "PhenoCam" installed on the north side of the main house. The purpose of the PhenoCam is to record images everyday of leaf cover and color and is used for measuring phenology throughout the season. Images are sent directly via the internet to Harvard University (http://phenocam.sr.unh.edu/webcam/about/).

Downloading Images:

The following are instructions to downloading camera images.

1. Point browser to: https://phenocam.sr.unh.edu/webcam/accounts/login/?next=/webcam/network/download
2. Create username and password if you don't have one and log in
3. Select site (Intervale)
4. Enter dates do download data from 1/1/YEAR to 12/31/YEAR
5. Enter time as 10:00 to 14:00
6. Hit submit to download .zip file
7. Decompress file and open folder

Creating time Lapse:

1. Use a program to create a time lapse (I use Time Lapse Assembler)
2. Save compiled time lapse under data folder

Downloading data:

1. There are tools available for downloading data from the PhenoCam, but this is beyond our abilities. Contact the PhenoCam program for more information.

Preliminarily processed data calculations

We compile raw data and save these datasets at the end of every season. We also perform a rudimentary set of preliminary analyses on yearly data so that periodic comprehensive data analyses can be performed much more efficiently. Preliminary analyses are also useful for including in the yearly report from the preserve. Some of these calculations include degree day calculations, house energy use, snow-cover dates, and phenology trail phenophase calculations.

Degree Days

Degree days area way to document the accumulation of heat beyond a threshold temperature over a period of time. For our purposes, we use 4.4 degrees Celsius as a

threshold temperature and use a simplified daily temperature average (min+max/2) to base our degree day calculations on.

Calculations

1. Open last year's degree day calculation file in Excel
2. Arrange values from weather station data download to match this file
3. View column functions and copy those functions to new file
4. Copy and past degree day calculation functions to entire data table based on previous year's example for calculating degree days
5. Create second sheet within workbook and name "Degree Day Dates"
6. Record degree day dates for every 100 degree days up to 2000 (choose the date after which the degree days past the 100 dd mark (e.g.. the date after 300, 400, 1200 dd)
7. Save file as 150420_2015_DegreeDaysCalcs.xlsx under Prelim Analysis data

Phenophase calculations with Nature's Notebook data

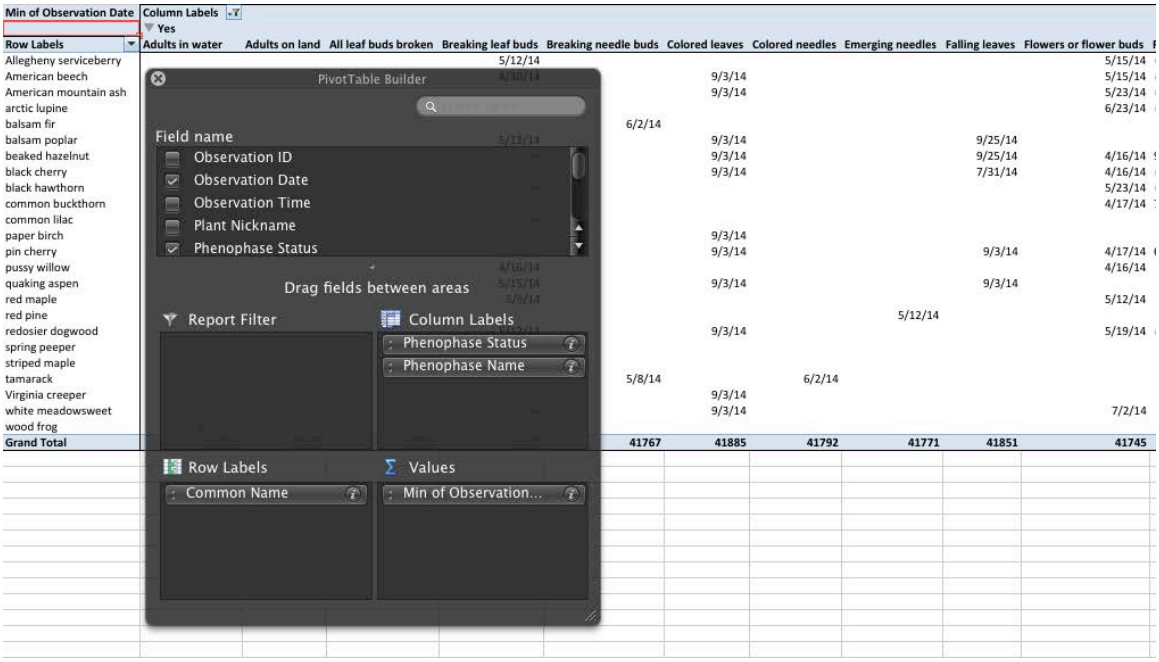
(note: protocol for anuran call surveys not yet developed)

Data recorded in nature's Notebook is in a raw format showing all positive and negative responses for observations of phenophases. To be useful, these data need to be sorted and compiled so that for each species we can know first of year dates for phenophases (budbreak, flowering, senescence) as well as duration of key phenophases (flowering, leaf growth, photosynthesis season).

Nature's Notebook has developed a YouTube video describing how to do these steps: https://www.youtube.com/watch?v=GHlheFVdbo0

1. Highlight entire spreadsheet and select pivot table
2. Drag Phenophase name and Phenophase status to report filter box
3. Under phenophase name, deselect all, then select breaking leaf buds, open flowers, colored leaves
4. Under phenophase status, select only yes
5. Drag day of year to Values area
6. Change day of year parameters to min to get the first day of year for a yes occurrence for that specified phenophase
7. Drag common name to row labels
8. Save file as 150420_phenophaseCalcs.xlsx.

The Pivot Table Builder should look like this:



Electricity production and use

The main house, guest house, and other structures at Intervale Lowlands Preserve use electricity. SiteSage monitors and reports electricity production and usage on the preserve. Each year we calculate total electricity production and use.

Calculations

1. Open Excel file with SiteSage data
2. Create sum for power production and power use for each of the two houses
3. Combine values in a single table to show net production and use for each house and as a combined unit

Archiving other materials

Website data

The Intervale Lowlands Preserve website (www.intervalelowlands.org) is hosted by HostMonster and the web content and themes are managed via Wordpress. Website backup is done through HostMonster using their website backup tool.

Backing up website data:

The following is a step by step guide to creating a website backup.

1. Point browser to https://my.hostmonster.com/web-hosting/cplogin
2. Login (ask Larry for login information)
3. Select Site Backup Pro under File Management
4. Select Backup and Restore Basic on next screen
5. Download Full Cpanel Backup

6. Save files under new directory (approximately 500MB)

GIS Files and Maps

We are constantly adjusting and adding layers to maps on the preserve. Our original maps are in GIS and we have an Adobe Illustrator rendition that we use for the website and signs. All other maps are in KMZ format for use with Google Maps. Current maps are kept and updated via Google Documents, and all maps are uploaded and stored in our backup directory at the end of the season.

Backing up mapping files:

1. Point browser to https://drive.google.com/folderview?id=0B_BsXK7JCc4Qfk9mWVdTRmt0LVp1WGJ5Z1hsQmQ0MmxrZXY1Y3pVaFhUYmZEWGl5WWt0b2M&usp=sharing
2. Download each KMZ file and save under the mapping directory.

End of Year Report and Backup Summary Report

The End of Year Report should be compiled yearly. The previous year's report can be modified by updating it with the following information:

1. Checklist of collected and backed up items (matrix with each year)
    a. iNaturalist
    b. eBird
    c. Phenology Trail - Nature's Notebook
    d. Anuran Call Surveys - Nature's Notebook
    e. NestWatch
    f. Other Phenology Data
    g. House Electric Usage and Production
    h. Weather Station
    i. Snow Monitoring Camera
    j. PhenoCam Monitoring Camera
    k. Website data
    l. GIS Files and Maps
    m. End of Year Report and Backup Summary Report (completed)
2. Preliminary calculations
    a. Degree Days
    b. Phenophase calculations with Nature's Notebook data
    c. Electricity production and use
3. List of preliminary data analysis report (key findings) (individual tables with year as column for each data set)
    a. Number of total species, and number observed this year
    b. Number of events total, and number per type
    c. Energy used and produced
    d. Frog calls

    e. Timing of select phenology events (willow flowering, red maple budbreak)
    f. Timing of 100, 200, and 300 degree days
    g. Numbers of management practices employed
4. List of surveys performed
5. List or research collaborations
6. List of backup files
7. List of press
8. List of publications
9. List of events
10. List of presentations
11. Budget for previous year
12. New equipment purchased