

LICHEN SPECIALIST IDENTIFICATION PROCEDURES

Susan Will-Wolf

Revised from documents co-authored by Bruce McCune, John Dey, Peter Neitlich, and Susan Will-Wolf
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INTRODUCTION AND ACKNOWLEDGEMENTS

The lichen identification specialist has two primary tasks: 1) Assign names to lichen specimens collected by the FIA field crew and record the data; 2) Maintain an official 'chain of custody' log for receipt of all FIA lichen samples and for sending on to the lichen Indicator Advisor (IA) all lichen samples and lichen data.

In some cases the identification specialist also acts as trainer (see Lichen Specialist Training and QA Procedures), whose roles are:

1. Conduct or assist with training of field crews.
2. Conduct or assist with field audits.

This document is revised as needed, to update and clarify language. The lichen indicator field protocols have remained stable since 1994 (McCune and others 1997). The goals and basic lichen specialist protocols for specimen identification and data management have also remained stable since 1994; improvements and updates in data management and documentation of protocols have been made as the program matured. All taxonomic changes made have preserved full backward compatibility since the indicator was first implemented. This document is slightly revised from a 2007 version that evolved from earlier specialist chapters in training manuals authored by Bruce McCune, Peter Neitlich, and Susan Will-Wolf, and from critiques and contributions by the many contractor lichen specialists and office assistants to FIA lichen Indicator Advisors.

McCune, B., J. Dey, J. Peck, K. Heiman, and S. Will-Wolf. 1997b. Regional gradients in lichen communities of the southeast United States. *The Bryologist* 100:145-158.

Will-Wolf, S. & P. Neitlich. 2006. Specialist Chapter. in Training manual: the lichen community indicator in FIA and FHM. USDA Forest Service, FIA program. Internal document. Updated from similar chapters 1995-2005.

GENERAL INSTRUCTIONS

Lichen specimens arrive in one of two ways: **A.** Specimens are sent directly by field crew members or auditors, or **B.** Specimens are sent by the lichen IA. If received from the field crew, first follow the instructions in Part A below, then follow the processing procedures in B.

Maintaining an official 'chain of custody' log: In recent years FIA data have been involved in court cases related to forest management, a reminder that official documentation of chain of custody for FIA samples and data while they are out of FIA custody is a necessary part of standard FIA practice. Copies of emails acknowledging receipt of samples with a list of plots received from the field or elsewhere, and emails accompanying submission of data files and notifying the lichen IA that plot samples are being sent on (with tracking) are acceptable documentation. The lichen specialist copies all emails to the lichen IA so the lichen IA can assume the responsibility for maintaining the official documentation of chain of custody. The plot tracking file with dates of receipt for plot samples is another piece of chain of custody documentation.

A. For Specimens Received Directly From Field Crews

1. Open boxes immediately and check for damp lichens. If any are damp, thoroughly air dry them. Contact the regional logistics coordinator within a day or two to confirm receipt of the plot samples with a list of the plots received. Either copy the lichen IA on email acknowledgement, or email the IA that plots have been received and the regional coordinator has been notified in some other way. By acknowledging receipt, the lichen specialist accepts responsibility for sample custody.
2. Keep a list of comments/suggestions for the field crew, and contact crew members or the regional logistics coordinator about concerns early in the field season. If plots arrive without plot data cards, immediately contact the crew supervisor. If

none were filled out, stress the importance of completing them. If they were filled out and not sent, they should be mailed to the specialist to be stored with the plot samples. Other typical problems are samples damp or too small, unclear packet data notation, missing abundances, overcollecting. Periodically report to the lichen IA (by copying emails, for example) about field season activities.

3. The lichen specialist receives a master tracking file from the IA or the regional FIA crew coordinator. In that tracking file -- soon after each plot collection is received -- enter date received plus date collected, county, and collector's name (from the plot data card) in separate columns in the row corresponding to the plot's P3HEX¹ (=HEXID) number. If you are informed that a plot on the list was not searched for lichens, add the reason in the file (non-forest, access denied, etc.) and do nothing more.
4. Email or call the regional FIA contact person as soon as you notice ANY problems with P3HEX numbers (such as numbers not on the master list, duplicate numbers, wrong county, etc.). Resolve these problems as soon as possible through consultation with the regional FIA contact person. Send copies of email correspondence to the lichen indicator advisor. Please note that lichen data are submitted and stored under the P3HEX number. There are also P2HEX numbers and plot identifiers consisting of state code, county code plus PLOT number in this program; if plot samples come in with either of the latter identifiers, EVERY plot number (all forms, the plot data card, and every single sample packet) must be changed to the corresponding P3HEX. To avoid having to do this too much yourself, email the field crew coordinator if this happens and tell them they or the field crew should check over and change everything to the correct number scheme before they send the samples to you. And buy an 8-number stamp to make it easier on yourself – you don't send back samples, at least at first, that arrived to you with the wrong number set – you fix them.
5. **By November 1st**, send the IA an updated copy of the master tracking file which includes your notes for all P3HEXs for which plot samples were received, for plots for which you were notified the plot was searched but no lichens were found, and for other plots as you received information.

B. For Processing All Specimens

1. Acknowledge receipt of plot samples from any other source, as needed. For each set of plot specimens, identify the contents of each packet. Consult the most recent Lichen Species Notes file and other lichen identification notes for current taxonomic usage in the FIA program. Record species name on the packet along with any incidental species and note "remarks" pertinent to the ID. List any chemical tests performed and their results. See instructions under "DATA RECORDING - DETAILS" for cases of multiple collections of the same species, missing values, and incidentally collected species.
2. Create one "Lichen Identification (ID) Data Sheet" per plot; preprinted forms with hand-entered information and computer-generated final Lichen ID data sheets are equally acceptable. At the top of the Lichen ID data sheet, enter information from the data card. For each sample, record data (species code, bag #, abundance) as outlined below in the "GUIDE TO THE LICHEN IDENTIFICATION DATA SHEET."
3. Return lichen specimens to their original packets. After identification, rebundle each plot with its original plot data card.
4. If you identify a species that is NOT on the current Lichen Species Master List (received from the lichen IA; reformatted from the most recent REF_LICHEN_SPECIES table in the FIA database, not the older FIADB version on the Web) – for which there is no assigned code number – notify the IA of the species name, state and plot number. A code number will be needed before data entry can be completed, so the sooner new species are reported, the better. Only one person, usually the lichen IA, may assign new code numbers for newly encountered species.
5. Each lichen specialist creates and adds to each year an official voucher set of specimens for a particular lichen region, documenting the specialist's taxonomic decisions for each species found. The voucher set should include at least one good example of each species found over the years of the specialist's participation in the FIA program, plus any other noteworthy collections (e.g., excellent specimen, odd variant, good range extension, etc.) selected from FIA plot samples. In the comments section of the Lichen ID data sheet, record which packets were removed for vouchers. During the season keep these "To Curate" packets (which later will be re-packaged as vouchers) separate from the original plot bundle. When ID has been completed, curate the voucher specimens into new, labeled, acid-free 100% cotton bond paper packets (#7 below).

¹ All numbers in this document representing P3HEX or HEXID are fictitious examples, not actual plot numbers.

6. If it is convenient, photocopy the original plot data card, staple the original to the plot's original Lichen ID data sheet, and bundle the copy with the plot samples. Photocopy the completed Lichen ID data sheet and retain the copy until you have confirmation that the original sheets have been received by the IA. (Submit receipts for copying as needed.) The lichen IA may well want your copies for archiving with FIA offices when you are ready to discard them.

7. **Vouchers.** When ID is complete, repack vouchers into packets made from acid-free 100% cotton bond paper. Preprint herbarium-quality labels directly on the packet paper or prepare separate labels, using the label template and instructions provided here or as separate files by the IA. List any chemical tests performed and their results. PLEASE NOTE: as of the 2005 field season, public herbarium voucher labels MAY NOT include the P3HEX number, nor the coordinates decoded from it. Voucher labels MUST include the FIA state code, county code, and public 'FIADB_PLOT' identifier (in the format **state-county-plot**) as well as public plot coordinates provided to the lichen ID specialist. Labels must be black laser-printed, photo-duplicated, or hand-written with archival-quality ink, on acid free 100% cotton bond paper. Ink-jet or other water-soluble ink printers and colored ink are not acceptable. If attaching separate labels, use white glue such as Elmer's or a glue stick that is labeled 'permanent and acid free' (adhesive of some glue sticks degrades over time). Prepare a list of your vouchers; keep a copy for yourself. In your second and later years as an ID specialist, you will add to your original voucher set rather than duplicating the entire set each year.

The official voucher collection will be deposited in a public herbarium. For ID specialists living away from that herbarium, official vouchers are quite inconvenient to access on a routine basis. ID specialists working remotely should keep for themselves a second informal voucher set made from crew samples, to the extent possible.

8. If contracted for these tasks, prepare electronic files for: Plot / Species code / Abundance code data (see ELECTRONIC DATA ENTRY section)

9. By October 31 (check contract) preliminary ID of blind check plots should be submitted (electronic files) to the IA.

10. By about February 1 of the following year (check contract) email electronic data and other files to the lichens IA, and send hard copies and samples via a mailing service that includes package tracking (Submit receipts for postage as needed.).

- The completed original Lichen ID data sheets (hard copy or electronic) +/- hard copy plot data cards (keep a photocopy until they are received).
- Bundled samples with their plot data cards or copies.
- Lichen Specimen Mailing Forms (hard copy that accompanied the samples when they were originally mailed to you; but keep a photocopy of these forms for your records.
- Curated voucher specimens (from selected specimens previously set aside) and corresponding voucher species list.
- Contributions to the isomorph list and identification notes in the REF_LICHEN_SPP_COMMENT table, and contributions to additional technical identification notes for your region (both electronic).

ISOMORPHS

Isomorphs differ chemically but are morphologically identical or nearly so. We encourage specialists to contribute additional species to the regional lists included in the REF_LICHEN_SPP_COMMENTS table for the sake of future specialists and the program's data quality. In the identification process, isomorphs or near isomorphs are identified to species (or species groups) only to the extent possible with the combination of unambiguous cortical and medullary spot tests and long-wave UV lamp exam results. Thin-layer chromatography analysis, which is necessary to identify some chemical species or to confirm tentative identifications of other chemical species, is not done routinely in this program. Also, anatomical sections to reveal microscopic details (such as spore examination or LM examination of fungal tissue type in cortices of some specimens) are not generally done. In some cases, these would be needed to distinguish near-isomorphs. Note – you can do these more detailed procedures if you wish, but the FIA program will not pay for your time!

GUIDE TO COMPLETING the LICHEN IDENTIFICATION DATA SHEET

If you have ANY questions about how to fill out a Lichen ID data sheet, please call us to clarify—it will save us all a lot of time! Electronic files are acceptable if they have all of the characteristics of the hard copy data sheets described below.

Use this guide with a blank Lichen Identification Data Sheet that came with your specialist information packet, use copies of Lichen ID data sheets tailored to your region if they are provided, or tailor your own region-specific sheet. Most lichen ID specialists will have received files with region-specific Lichen ID data sheets that contain pre-entered species names and codes. If you create electronic Lichen ID data sheets, please maintain columns as they appear in the Lichen ID data sheet files provided. Also maintain species order on the sheet as you entered them in the data file; DO NOT resort them.

FIRST, fill out the upper fields from the plot data card, as follows. These fields differ somewhat on different Lichen ID data sheets.

Plot No. P3HEX [from Plot Data Card]* Field Collection Date: [from Plot Data Card]
 Lichen specialist: Your name County, State: [from Plot Data Card]
 Collector: Crew name ID Date: _____ [your date]

*Please verify that all of the information, especially the P3HEX (= HEXID = old FHM hexid) number, on the Plot Data Card is the same as the number on the sample packets, and that it has been correctly copied to the ID sheet. Report any anomalies to the lichen IA immediately.

NEXT, identify all species in each packet and enter data in the “Species Name” and “Data from Packets” fields as specified below. Use the attached sample Lichen ID data sheets as guides. After you identify the species(s) in the first packet, do the following:

- Fill out the species name in the left hand column (or find the species name in pre-printed regional versions. If not already there, write the name in a blank space at the end of the list.)
- On the right hand section of the Lichen ID data sheet (under the heading “Data from Packets”), enter the Collection No. from the packet into the first “#” column, and the abundance code as marked on the packet into the first “A” field. (If using preprinted forms, enter the Collection No. in the “Bag #” column, and circle the appropriate abundance code in “Abund.”)
- If **Incidental Species** are found, write or locate their name(s) in the appropriate place on the Lichen ID data sheet and clearly handwrite an abundance of zero (0). (If using preprinted forms, draw a line through the 1..2..3 numbers and write in the zero.)
- For **Abundance Code 4** – on preprinted forms -- draw a line through the 1..2..3 and handwrite 4 in the abundance column.
- If the **Abundance Code is missing** from the packet, enter a zero (0) abundance on the packet and Lichen ID data sheet for that collection.
- If a **Collection Number is missing**, assign it a sequential number starting after the last numbered packet.
- Continue identifying species in all remaining packets. If a species is identified more than once, fill in subsequent bag #’s and Abundance codes to the right of the first entry, as needed.

ONCE ALL PACKETS ARE IDENTIFIED, fill in the boxes under the heading “Final Data” (or “Data to Enter”). These two columns are to the right of the species name column.

Species Code. If the code is not pre-preprinted, fill in “Sp. Code” (Species Code) from the most recent FIA Lichen Species Master List (see the latest data file ‘LichenSpeciesXX’).

Abundance Code. Fill in the Final Abundance score (“Abun” or “Abund”) using the addition rules in the section “Calculating the Final Abundance Scores” below.

If contracted to do electronic data entry, enter the data and prepare a text (.txt) file using the instructions provided in the section “SAMPLE LICHEN DATA FILE.” Order of species on the Lichen ID data sheet should match order of entry into the electronic data file; this makes using Lichen ID data sheets to proofread electronic data output easier and less prone to errors.

Lichen Identification Data Sheet -- SAMPLE

NOTE: This sample Lichen ID data sheet uses the data for the first Nevada plot in the Example Data Input File below.
NOTE: P3HEX (= HEXID) numbers throughout this document are fictitious examples.

Plot No. 5512336

Field Collection Date July 29, 2002

Lichen specialist Neitlich

County, State Casino, NV

Collector W. Tidwell

ID Date 10/05/02

= Coll. No. A= Abundance on packet. Abun = Final Abundance (see rules). Sp. Code – See Epiphyte Master List

	Species Name	FINAL DATA		DATA FROM PACKETS								Comments	
		Sp. Code	Abun.	#	A	#	A	#	A	#	A		
1	<i>Flavopunctelia soreдика</i>	2704	3	1	3	7	2	5	0				
2	<i>Melanohalea subolivacea</i>	4017	3	3	2	8	2	9	3				
3	<i>Physcia adscendens</i>	5701	1	6	1								
4	<i>Physcia biziana</i>	5705	3	2	1	5	2	11	2				
5	<i>Usnea hirta</i>	8041	2	10	2								
6	<i>Xanthomendoza fallax</i>	8203	2	4	1	12	1						
7	<i>Phaeophyscia hirsuta</i>	5605	0.01	11	0								
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													

3/2003

Abundance codes used by field crews: 1 = Rare (1-3 individuals seen), 2 = Occasional (4-10 individuals seen),
 3 = Common (> 10 individuals seen), 4 = Abundant (more than half of the legal substrates have this species).

Species codes: Refer to Lichen Species Master List for lichen species code numbers.

DATA RECORDING -- DETAILS

Incidentally Collected Species

Despite the best efforts by the field crew, the lichen specialist will occasionally encounter species collected incidentally along with the target species. These species need to be identified by the specialist, but will not have an abundance value assigned by the field crew. The incidental species name should be recorded both on the packet and Lichen ID data sheet. Also on the Lichen ID data sheet, note the Collection or Bag Number and record a missing value indicator of zero (0) in the abundance column.

Missing Values

As with incidental species, when an abundance code is absent from a packet it is entered on the Lichen ID data sheet as zero (0).

Entering '0' Abundances

If the final abundance for a species is zero, it is entered into the computer as 0.01. At a later time – after data have been submitted to the Forest Service for analysis – 0.01 values automatically will be converted to 3's for most kinds of analysis. This substitution is used because a score of 3 is by far the most probable value for the abundance code.

Handling Multiple Collections of the Same Species

In the field, crew members are instructed to err on the side of assuming that individual specimens are different, when they are unsure if a new specimen is different from ones already collected. So it is expected that in many cases, two or more collections from a given plot will be of the same species. This should be noted on the Lichen ID data sheet by recording multiple specimen numbers on the same species line.

Recording Genus-Only Specimens

Use the comments section to explain why a genus-only specimen is not named to species. Note if it is too small, or tell how it differs from other species in the genus already listed. Defend your decision: clearly indicate how this specimen is different from species already identified in the notes section on the Lichen ID data sheet. If a good specimen does not match a described species, a voucher should be prepared. Enter a genus-only code into the electronic data file (and record this on the Lichen ID data sheet) only when you are quite certain that this specimen cannot be referred to a species in the genus that is already identified for this plot, or if no other members of that genus were found. There is one exception: enter a *Cladonia* sp. if it has podetia but cannot be identified to species and it appears different from all other *Cladonia* species recorded on the plot; do not enter squamules only. In the notes section on the Lichen ID data sheet, make a note that podetia are present, or the data will not be entered.

Recording Unknown Specimens

The code 9999 should be used for a specimen that cannot even be assigned to genus when it is of reasonable size and has particular identifying characters. Any sample that fits this designation should be included as a voucher specimen. Specimens that are too small to identify should not be assigned this code.

CALCULATING FINAL ABUNDANCE SCORES

In the field, the following criteria are used to assign abundance scores as reported on the packets:

- 1** = Rare (1-3 individuals seen)
- 2** = Occasional (4-10 individuals seen)
- 3** = Common (> 10 individuals seen, but on fewer than half of legal substrates)
- 4** = Abundant (more than half of legal substrates have this species).

After all collections from the plot have been recorded, a final abundance score needs to be calculated for those species having two or more specimens. Record that number on the Lichen ID data sheet in the appropriate "Final Data" or "Data to Enter" column, using the following rules for combining values.

Recorded values

Final Abundance

1 + 1	2
1 + 1 + 1 + 1 + 1	2
More than five 1s.	3
1 + 2	2
2 + 2	2
1 + 1 + 2	2
1 + 1 + 1 + 2	3
1 + 2 + 2	3
3 + any others	3
4 + any others	4
0 + 1	3
0 + 2	3
0 + 3.	3
0 + 4.	4
0 (any number of 0s with no other values)01

ELECTRONIC DATA ENTRY – Creating a DATA INPUT FILE for FIA Lichens

The “compact data entry” file structure described below is the official data entry format and is also acceptable to "PC-ORD" data analysis software. Such a file, when used with a master file of lichen species names containing number codes and 6-letter acronyms (the Lichen Species Master List) together allow data manipulation in PC-ORD.

These instructions are for entering data in your favorite word processing program, or in a simple text editor program. If you are comfortable using spreadsheets, instruction #11 tells how to enter data efficiently into a spreadsheet. If you aren't really familiar with spreadsheets, stick to using a word processor.

FILES

1. Prepare three files (or only two if there are no QA samples).
-- Plot Data -- QA Data -- Notes
2. Give filenames that include either the whole region or the states (such as NY+ME or NYME - no commas or other punctuation allowed) and the year (03 is fine) without spaces. For example, name the plot data file “NYME03-Data” and the QA file “NYME03-QAData.” Use the same root name for the notes file, for instance “NYME03-Notes.
3. Save all data files to submit as simple text files, using your word processing or spreadsheet program. Such files have a '.txt' extension. You save as one of these: ASCII DOS text -or- Text Only -or- Tab-delimited text (or ASCII text). Comma-delimited text is acceptable, but not preferred. It depends on your software what it's called. You can also prepare the compact data document using Simple Text or Notepad or other software that automatically saves in a .txt extension, thus avoiding having to convert. The choice is yours.

DATA ENTRY

1. For these compact data files, do not type any characters other than letters, numbers, and forward slashes. Use either the space bar between entries or a customized tab setting. End each data record with a hard return (Enter). NOTE - there is no title allowed in the body of the file.
2. For hot audits and blind checks, the crew person's plot is entered into both the regular plot data file and the QA data file. In the QA file, you will have 2 or more samples for each plot number. In ONLY the QA file, give the crew sample one letter after the P3HEX number (such as 5512536a), and the expert sample a different letter after the same P3HEX number (such as 5512536x). In the Notes file, tell exactly who -- field crews and experts, by name -- each letter stands for. Use letter codes assigned by the IA if you are sent such a file; create your own set of letter codes if you are not sent them. Use the same letter for the same person throughout the file. You can also write other notes to the lichens IA there.

3. States are entered into the file in alphabetical order. P3HEX numbers for one state are grouped together. Within a state, list P3HEX numbers in ASCENDING NUMERICAL ORDER (smallest number first).
4. On the top line of the file's first page, type "BREAK" or "break" (caps optional) flush left to the margin, no spaces. Hit Enter. On the next line, type the two letter postal code for the state flush left to the margin, no spaces (caps optional). Hit Enter. Type the first P3HEX number and proceed as described below. When a state's data entry is complete, hit Enter. With no blank lines, type "BREAK," then the next state's postal code, and so on. If there is a blank line between states, it will cause an error in the regions' uploading of data. When you finish the last entry for the last state, hit Enter, but type nothing more.
5. A data record for a single plot consists of two lines at minimum. The first line gives the P3HEX number, flush left to the margin. There are 8 spaces allowed to this entry -- no blank spaces. Put the P3HEX in the first 7 spaces. For QA plots, add one letter in the 8th space (see #2 above). Hit Enter.
6. On the second line, enter species and abundance information. Each species entry is a couplet of numbers. At the beginning of the line type the first species number code, space (or tab), then type the species abundance code. Space again, then type the next species code, space, abundance code, space, and so on. Abundances of "0" are entered as "0.01" If there are lots of species, the data may require two or more lines. Keep typing and let the line wrap automatically for as many lines as needed. Species code numbers and abundances should be entered **in the order they appear** on the plot Lichen ID Data Sheet, whether on a hand-annotated preprinted sheet/species list or on an electronically-generated sheet.
7. After the last species abundance code, hit the space bar once, type a forward slash "/" and then hit Enter. If the space is missing, there will be no error generated in PC-ORD; however, a missing space will generate an error in the FIA database when the data are uploaded. In FIA lichens data protocol and PC-ORD software, "/" signals the end of a record for a single plot. Start the next P3HEX on the next line.
8. Plots searched and found to be empty of lichens should be included in the electronic data set. For an empty plot, type the P3HEX on the first line, hit Enter, type a forward slash on the second line, then hit Enter.
9. If a lichen specimen is identified only to genus (and hence is listed as "Genus sp." on the Lichen ID data sheet), enter it into the electronic data file ONLY if either it is different from other species based on notes on the Lichen ID data sheet, or there are no other species of that genus found on that plot. Also, ONLY enter "Cladonia sp." for a specimen that has a note saying podetia are present but the specimen can't be assigned to a species or FIA species group and it appears different from any other *Cladonia* sp. on the plot. NEVER enter the genus-only code for a specimen consisting only of squamules.
10. There are several strictly squamulose or crustose genus and species names, such as *Normandina pulchella*, *Hypocenomyce* spp. and *Catapyrenium* spp., listed on the Lichen Species Master List. DO NOT enter these into an FIA electronic data file, just note them on the Lichen ID data sheet. See the REF_LICHEN_SPP_COMMENTS table.
11. FOR SPREADSHEETS. You can enter data in two ways: A) Enter exactly as described above, listing plots in numerical order by state, or B) Put the HEXID and data all on one line, sorting lines later by number and then manipulating the sheet into the two-line format, adding "BREAK" and state codes.

Method A. In the top left cell type "BREAK" In the next cell down enter the two-letter state code. In the third cell down, type the P3HEX. In the fourth cell down, enter species and abundance data using the protocol above, but each time the directions say "space" move one cell to the right. A forward slash ends the record (and occupies the cell to the right of the last abundance code). Don't leave empty cells in the row.

Method B. To record in one line, enter the P3HEX in the leftmost cell, put the first species code in the next cell right, list abundance in the third cell, and so on. Within a state, use the sort function to put P3HEX lines in ascending order (smallest number first). The last thing you do, after data entry is complete, is copy your page to a new page, and manually add a blank line after EACH data entry line. Next, highlight and cut the data to the right of each P3HEX number (all species & abundance pairs, plus the forward slash) and paste in the next row down, flush left. That gives you the two-line data record that is needed. Add BREAK and the state code – on the two rows directly above the start of each state's records. Save the new page as a tab-delimited text (.txt) file, and submit copies of both the spreadsheet and text file.

12. BE SURE TO **PROOF-READ** YOUR DATA FILE COMPLETELY BEFORE YOU SEND IT TO THE LICHENS INDICATOR ACVISOR! THIS INCLUDES CHECKING TO CONFIRM THAT PLOTS ARE LISTED IN NUMERICAL ORDER.

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Following is an example data file as it should look. It is followed by selections from that file to illustrate important file features, along with explanatory comments.

Note: The HEXID numbers throughout this document are fictional examples.

Example of a DATA INPUT FILE

```

BREAK
AZ02
5512535
2704 3 4017 0.01 4002 3 5701 3 5705 3 8000 3 8214 3 8203 1 /
5512546
2704 3 4017 3 5701 0.01 1008 0.01 5705 3 5723 3 5801 0.01 6303 3 8041 3 8203 3 /
5512552
2704 3 4017 3 4002 3 5701 3 5705 2 8041 3 8214 2 8203 3 /
5512571
2704 3 4004 1 4017 3 5701 3 5705 3 8044 3 8203 2 /
BREAK
NV02
5512536
2704 3 4017 3 5701 1 5705 3 8041 2 8203 2 5605 0.01 /
5512542
5602 3 5605 3 5705 3 8203 2 /
5512566
/
5512578
2704 3 4017 3 5701 2 5705 3 5611 0.01 8000 3 8214 3 /
5512579
607 3 610 3 8152 2 1200 2 2704 3 4017 3 4004 0.01 4800 3 5201 3 5612 3 5600 3 5611 3
5701 2 5906 3 6303 3 6920 3 8044 3 3106 3 /
55612610
610 0.01 4017 3 5723 3 5701 3 8044 3 8203 3 8214 3 8041 0.01 9000 3 /
5512613
4017 3 4002 3 5612 1 5723 3 5700 3 5701 1 8044 3 8214 3 /
BREAK
WY02
5512601
4002 3 5705 3 8214 2 8203 3 /
5512609
4017 3 /
55612744
2704 3 4017 3 4806 3 5907 2 5707 3 5705 3 5701 2 8041 3 8203 3 8214 3 /
5512767
4004 3 4017 0.01 5701 3 5705 3 8214 3 8044 3 /

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COMMENTS ON THE EXAMPLE DATA FILE

Only selected entries were copied for illustration. Comments appear below the examples.

```

BREAK
AZ02

```

The two lines above label the state as a subgroup of the whole data set. They go at the top of a group of data records. (The QA dataset will have one or two subgroups - either or both QA-Hot and QA-Blind. Use these titles in place of state codes.)

```
5512535
2704 3 4017 0.01 4002 3 5701 3 5705 3 8000 3 8214 3 8203 1 /
```

The two lines above make one data record, for HEXID 5512535. Note the second abundance code is 0.01 -- that's how you enter an abundance of "0" Also note there's a space between the last number (always an abundance code) and the forward slash which signals the end of that plot record. There's a hard return (Enter) after the forward slash.

```
5512566
/
```

The two lines above illustrate how to enter a plot that was visited and searched but had no lichens.

```
5512579
607 3 610 3 8152 2 1200 2 2704 3 4017 3 4004 0.01 4800 3 5201 3 5612 3 5600 3 5611 3 5701 2 5906 3
6303 3 6920 3 8044 3 3106 3 /
```

When there are lots of species, the record may take two or more lines. In a word processor, don't make a hard return in the middle of the line of species and abundance codes - just let it wrap around on its own. In a spreadsheet, type all species information into a single row. When you export as a .txt file, soft line breaks will be added automatically.

```
5512610
610 0.01 4017 3 5723 3 5701 3 8044 3 8203 3 8214 3 8041 0.01 9000 3 /
5512613
4017 3 4002 3 5612 1 5723 3 5700 3 5701 1 8044 3 8214 3 /
BREAK
WY
5512601
4002 3 5705 3 8214 2 8203 3 /
```

As above, when one plot or state (or QA) subgroup ends, begin the next without leaving a blank line between.

```
5512609
4017 3 /
```

This plot above had only a single species.

```
BREAK
WY
5512601
4002 3 5705 3 8214 2 8203 3 /
5512609
4017 3 /
55612744
2704 3 4017 3 4806 3 5907 2 5707 3 5705 3 5701 2 8041 3 8203 3 8214 3 /
5512767
4004 3 4017 0.01 5701 3 5705 3 8214 3 8044 3 /
```

There is no special marker for the end of the file - just the final forward slash.

Lichen Identification Data Sheet

Plot No. _____

Field Collection Date _____

Lichen specialist _____

County, State _____

Collector _____

ID Date _____

= Coll. No. A= Abundance on packet. Abun = Final Abundance (see rules). Sp. Code – See Epiphyte Master List

	Species Name	FINAL DATA		DATA FROM PACKETS								Comments	
		Sp. Code	Abun.	#	A	#	A	#	A	#	A		
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													

3/2003

Abundance codes used by field crews: 1 = Rare (1-3 individuals seen), 2 = Occasional (4-10 individuals seen),
 3 = Common (> 10 individuals seen, but on fewer than half of legal substrates),
 4 = Abundant (more than half of the legal substrates have this species).

Species codes: Refer to Epiphyte Master List for lichen species code numbers.

Lichen Identification Data Sheet

Plot No. _____

Field Collection Date _____

Lichen specialist _____

County, State _____

Collector _____

ID Date _____

= Coll. No. A= Abundance on packet. Abun = Final Abundance (see rules). Sp. Code – See Epiphyte Master List

	Species Name	FINAL DATA		DATA FROM PACKETS								Comments	
		Sp. Code	Abun.	#	A	#	A	#	A	#	A		
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													
32													
33													
34													
35													
36													
37													
38													
39													
40													

3/2003

Abundance codes used by field crews: 1 = Rare (1-3 individuals seen), 2 = Occasional (4-10 individuals seen),
 3 = Common (> 10 individuals seen, but on fewer than half of legal substrates),
 4 = Abundant (more than half of the legal substrates have this species).

Species codes: Refer to Epiphyte Master List for lichen species code numbers.

Example Voucher Label

To be printed on a sheet that is then folded into a packet.

Note: the bottom margin for this sheet will need to be reduced to its smallest allowed value to position the label properly.

Lichens of Maryland 2005 Mid-Atlantic Voucher Specimen Forest Inventory and Analysis Program

Phycia aipolia

Medulla K+ yellow

FIA Plot (State-County-Plot): 24-19-1605

Coll No: 5 Abundance: 3

Approx. Latitude: 38.460228 Longitude: -76.01896

Elevation: 7 ft

Date: 28 May 2005

Collector: Jane Doe

Identified: John Smith No.: J. Smith 4000