NON-VERTEBRATE PALEONTOLOGY LABORATORY

OF THE TEXAS NATURAL SCIENCE CENTER OF THE COLLEGE OF NATURAL SCIENCES OF
THE UNIVERSITY OF TEXAS AT AUSTIN

PROCEDURES AND PROTOCOLS

FOR FOSSIL CURATION, COLLECTIONS MANAGEMENT, AND PALEO-HOUSEKEEPING

ANN MOLINEUX
Collections Manager

With much help from
Lynn Morgan, Melissa Gunter, Miriam Akselrod, Fabienne Grellet-Tinner, and Joe Frost

September 1999
Edited July 2002, May 2003

I. INTRODUCTION

<u>Overview</u>

Detailed instructions for procedure are based on lots of experience with different types of collections, and lots of thought as to what is needed specifically for this collection. These procedures should be followed as closely as possible. Pay particular attention to instructions that are in all capital letters and have words such as NEVER, ALWAYS, DO or DO NOT. If, for any reason, regular procedure must be circumvented or altered or cannot be complied with, the Collections Manager or Supervisor must be informed before continuing with the procedure.

Any procedure can be modified, especially if you can come up with a better way to do it; one that is quicker, more efficient, and more informative to the collection user, or otherwise improves the collection. You may see something or may have heard of something which the designers of this protocol do not know about. Please don't hesitate to make suggestions. However, DO NOT make procedure changes without first informing the Collections Manager or Supervisor.

<u>This is really stupid!!" or "Why is it done this way?"</u>

Many procedures may seem inordinately fussy or detailed and extremely boring. If you think something is stupid, you may not pay as much attention to it when you are performing the procedure. Feel free to ask the Collections Manager or Supervisor why the procedure is done that way (you might phrase it in a less challenging form to get a more friendly answer, since the Collections Manager or Supervisor may have written the procedure). The purpose will be explained, hopefully so that you will understand the necessity of the step in preserving the condition of the fossil or integrity of the data. You may also be correct. It may be a stupid step and in need of revision. Helpful, constructive suggestions for improving the procedures are always welcome.

<u>Suggestions and Explanations</u>

Broad suggestions for procedure are those instructions which, at the discretion of the collections worker, may be improved upon or altered to fit the working preferences and ingenuity of the individual worker. These will usually include a phrase similar to, " . . . should be done . . . " or " . . .can be done. . ." These are not included as an invitation to cut corners and do sloppy work. They are used because it is understood that most rules cannot always be followed to the letter, and that a certain amount of leeway can actually help to promote and improve efficiency.

Explanations for the procedures are included to inform you why a particular step is required for this collection. Most steps have to do with protecting the specimen, protecting the provenance information of the specimen, making the specimen easy to locate within the collection system, and making the overall collection look as professional and up to current standards as possible.

II. HEALTH AND SAFETY

Personal health and safety must come before anything else, no matter what the job. If you injure yourself in any way or have any allergic reaction to dust, pollen, or from an unknown source, inform the Collections Manager or Supervisor immediately. If you notice an unsafe situation (electrical, chemical, structural, etc.) inform the Collections Manager or Supervisor immediately. If you require any special safety equipment such as goggles or ear plugs ask for it. Some safety equipment may require training or doctor's approval,

such as certain kinds of personal air filters or respirators. Talk to the Collections Manager or Supervisor about any health or safety concerns. Maps are given in the Appendix.

Know where emergency tools and equipment are located

Know where the nearest telephone is in case of emergency. Know where fire extinguishers first aid kits, sinks, hose, bibs, showers, and eye wash stations are in your area.

Fire safety

Know where all the exits are to the building in which you are working. Know where all the fire extinguishers are in every area in which you work.

First Aid Kits

First Aid kits are available in each of the cages in building 33 and in building 122. Familiarize yourself with their location in each building. If the kits need any supplies inform the Collections Manager or Supervisor so they can be obtained.

Particle masks

Particle masks provide protection from airborne irritants stirred up during cleaning of the specimens. These should always be available. If you can not find any, ask the Collections Manager or Supervisor.

Gloves

Disposable white cotton gloves or latex or vinyl gloves are provided to protect the specimens from body oils and perspiration on the hands of the worker, and to protect the worker from the dehydrating and irritating effects of the dust and specimen matrix.

Don't lock anyone in the cages

The cages in building 33 (Northwest, Southwest, East) are each locked with a combination padlock, from outside the cage. It is therefore possible to lock someone inside the cage. Before you lock each cage, MAKE SURE NO ONE IS STILL IN THE CAGE. WALK UP AND DOWN EACH AISLE, LOOK IN EVERY CORNER and YELL THAT YOU ARE LOCKING UP.

Power tools

Power tools include anything that whirs really fast, makes a loud noise, and can cut off, grind off, chop off, or skewer body parts in the wink of an eye. In other words, they are DANGEROUS. Grinders, electric screwdrivers, circular saws, chain saws, drills, routers, floor polishers, are all types of power tools.

Make sure the Collections Manager or Supervisor knows you are using power tools. Ultimate responsibility for your safety lies with those in charge of the NPL. They must know when you are operating dangerous equipment. Only operate power tools if you know how to use them, or if you have an experienced person showing you how to use them. Only operate power tools if there is someone else nearby. If an accident occurs, assistance will be available. Only operate power tools if the other people nearby know you are operating them. If others know you are working with dangerous equipment they will be more likely to check on you, and will respond more quickly if they notice a problem. When you use most power tools you should wear protective goggles or a face shield. Ask the Collections Manager or Supervisor for protective gear. TIE BACK long hair.

III. BEFORE YOU START

Attitude

Before you begin to work on a fossil collection, you must make sure you have the right attitude. If you are grumpy, or angry, tired, or depressed, you may make multiple mistakes in recording information, or inadvertently cause damage to the fossils. Shake it off, relax, and enjoy this opportunity to work in one of the greatest collections in the USA!

Don't let the project intimidate you. There are several million specimens in the Non-vertebrate Paleontology Laboratory collections. There are books and books of catalogues. The collections are the end product of more than a century of curious, enthusiastic, methodical, intense, and prolific paleontologists doing what they love to do. There is a lot of work involved in cleaning, labeling, identifying, repairing, and conserving the specimens. You will not be expected to do it all, although you will probably learn how to do it all. Just focus on the project at hand, keep at it, do it right, double-check your work, and it will get done.

Whatever you do, remember the work may be boring and taxing and sometimes mindless, but you are handling and working with some very old life forms. They can be fabulous, or incredibly unusual, are often only molds, or casts, or broken bits, but they are always interesting. You will come across great treasures and extremely bizarre shapes. You will have puzzling problems figuring out handwriting or data provenance. You can see it all as an adventure through time and history.

Communication

Talk to the Collections Manager or Supervisor regularly. Keep them informed about what you are doing. If you are not closely supervised, it is a good idea to show your work to the Collections Manager or Supervisor on a regular basis for praise and guidance. Refer to the checklist to see what tasks have not been tackled in awhile. If you would like to modify procedures, or have ideas about adding or shortening steps, this is the perfect time to show them or present them. *If you are not sure about something, just ask!*

Take your time and Pay Attention

When you are working in a drawer of specimens, it is VERY EASY to pick up a specimen, to look at the number and inadvertently, to replace the specimen in a different tray. Provenance is thus screwed up. The best way to avoid that problem is to pick up the entire tray, place it on a surface away from the drawer, then remove the specimen to look at it. This method of removing tray and specimen avoids a second problem; often pieces of the fossil break off as you pick up the fossil. If you pick up the fossil over a drawer, the broken piece may land in any other tray in the drawer, sometimes becoming impossible to find. If you set the tray away from the drawer, the separated piece lands on a surface where it can be found immediately and returned to its proper tray.

A guaranteed way to screw up large numbers of fossils in a short period of time is to rush through a procedure without thinking about the consequences. Know and understand the sequence of procedures, what the purpose of each procedure is, and why they occur in the specific sequence they do. If you rush through in order to finish more fossils or to get done early to take off for the weekend you may accidentally skip one or more procedures. Information about the fossil may be lost as a result.

If you screw up

Don't panic. EVERYBODY screws up sometime during the never-ending task of collections' management. The critical thing about screwing up is to realize you have screwed up, to cease screwing up immediately, and to rectify the screw-up as soon as possible.

If you make a mistake (mislabel a specimen, break a specimen, lose a specimen, discard specimen labels, lose the connection between the specimen and the label, etc.), stop whatever it is you are doing and inform the Collections Manager or Supervisor immediately. There is a phone in the Southwest cage beside the cleaning table…

If the Collections Manager or Supervisor is not immediately available, make a detailed note describing the problem and place it with the specimen. Sign and date the note and include specimen number, drawer number, or other information that associates the note with the problem specimen(s) (see Part V. PRINTING INFORMATION BY HAND, CODES, AND ABBREVIATIONS).

If it is a minor problem, such as mislabeling a specimen, it can usually be rectified immediately. If it is a more serious problem it may take planning to figure out how to bring it all right again, e. g. if you drop a drawer of specimens, thereby jumbling the fossils and their labels.

Don't exacerbate the problem. If you have mixed up labels and specimens in a drawer, stop working on that drawer entirely. Or if you drop a drawer, don't move anything, (except to keep a specimen from being damaged, and then make a drawing or notation of where the specimen was moved from). The positions of undisturbed trays or other labels and specimens may help to resolve the problem.

Sometimes, the temptation arises to ignore the screw-up, to hide it, or worst of all, to destroy the evidence (the Presidential Syndrome). NONE of these is a proper or desirable response. You won't be yelled at for making a mistake, but you might be yelled at if you try to cover it up.

Carry on. Learn from your mistake. Pass on what you learn to others.

Handle the fossils carefully

The specimens themselves are irreplaceable, so you must be constantly careful not to drop, bang, crush, or otherwise damage them. Most damage to fossils occurs by inattention, or haste, or ennui. If you feel you are at the point of falling asleep, or are getting silly and careless, stop what you are working on and do another step in the process. There are several steps that all need constant updating. If you ever have a question about any of the steps in the process, ask the Collections Manager or Supervisor. It is better to ask many questions, even questions that you may think are stupid, rather than make even one irreversible mistake.
Good motto for working in collections: Minimum intervention and Maximum reversibility.

Keep fossils and labels together

The label and specimen must not be separated until a definite link has been established that can always trace that unique label back to that unique specimen. This is done through several steps. The specimen must have a valid, complete specimen number printed, in ink, on the surface of the specimen, or on a label in the specimen vial, or on the specimen slide. Also, the specimen number must be printed on an Conservator (formerly Inventory) Label that is placed in a plastic zipper bag with the label and other documents from the specimen tray.

IV. LABELS

<u>What is the specimen label?</u>

The labels are as important as the specimen itself. The specimen labels place specimens within their proper position in the stratigraphic continuum of the fossil world. Without information about the stratigraphic and geographic origin of the specimen and its history within the collection, the specimen has limited scientific value.

A.   <u>Different types of specimen labels</u>

You will run into several different types of specimen labels. In order to understand the labels referred to in the protocols, the different labels will be classified into four broad categories: Archived Specimen, Working, Primary Specimen, Secondary Specimen Labels.

<u>Archived Specimen Labels</u>

These are any field label, note from a specimen tray, printed specimen label, or handwritten specimen label, discovered in a tray or with a specimen at the time of the current (1999-2000) collections' project. Most specimens have one or more pieces of paper in the tray with them. Some are original field documents that were printed when the specimen was first collected. Others are old collections' documents and labels printed when the specimen was first placed in a collection. Still other labels are replicas of the original documents, printed in a previous collection update. Some labels are over 100 years old. They are often brittle or otherwise deteriorating, so must be handled carefully.

As of now, we can not easily tell the chronological sequence of creation of multiple documents found with a specimen. The only thing we can be sure of is that they were all created before this project began. Therefore, any specimen labels and tray documents created before this project will be called "Archived Specimen Labels". These documents will be scanned, along with the current Conservator (formerly Inventory) Label, onto a database and filed by specimen number in Building 122.

<u>Working Labels</u>
All working labels are printed on acid free, archival quality paper.

<u>Inventory Label</u>

This label was formerly created to record the specimen number and quantity of specimens found with the same specimen number at the time of specimen removal after inventory. You may encounter this label when cleaning specimens that were pulled before August 1999. We now use a conservator label to record this information as specimens are pulled. If you come across this old label when you are cleaning the fossils, transfer the information onto a new conservator label and tear up the old inventory label.

Formation:
County:
Cabinet: **Date:**
Drawer:
Specimen:

9

<u>Conservator label</u>

This label will remain permanently with the Archived Specimen Labels
associated with the same specimen.

CONSERVATOR LABEL		
Location Prior to		**2001/2002**
Specimen:	**# of pieces:**	**Cabinet:**
County:	**# of specimens:**	**Drawer:**
Formation:	**Container:**	**Conservator:**

<u>Specimens Moved Label</u>

This label is created to record the specimen numbers of specimens that have
been removed from a particular drawer at the time of inventory. This label will
remain in the drawer from which the specimen was removed.

Samples Have Been Moved	
Location Prior to	**2001/2002**
Specimen #s:	**County:**
	Formation:
	New Location:
	Name:
Specimen #s continue on back	

Detailed instructions about filling out and using the Specimens Moved Label
can   be found under section VIII, D. Pulling specimens from drawers.

<u>Primary Specimen Label</u>

The Primary Specimen Label is <u>the</u> specimen label generated in the current IMLS project for each
fossil specimen (to differentiate it from all previously written labels found with the specimen; see
Archived Specimen Labels). This label will be displayed with the fossil in the specimen tray. All
information on this label will be as current and up-to-date as possible. Data on this label will
include the minimum amount of information for most researchers and collections workers to be
able to find and organize specimens. More detailed specimen information will be available on
database, and should be readily accessible by computer in the collections area.

The Primary Specimen Label includes data from the following data fields; Collection Acronym
(e.g. UT, WSA, BEG), Specimen Number, Specimen suffix - (e.g. the sub-number separating
different taxa within the same specimen number), Taxon (taxonomic name, lowest identified level
of classification), Formation (formal formation, name, if known), Member (formal member name,
if known), Collector (name of person who collected the specimen), Collection Date (date the
specimen was collected), Identified by (name of person who identified the specimen),
Identification Date (date the specimen was identified)

Bar codes are also included on the Primary Specimen Label for Collection Acronym, Specimen Number, and Specimen suffix. These are included for inventorying the collection.

The date when each Primary Specimen Label was printed will be included on the label as well.

Secondary Specimen Labels

Secondary Specimen Labels are those that indicate where a specimen is currently located, if it is not in the expected position within the collection. These labels include: Loans, Research, Exhibit, Oversize, Missing, Permanent Loan, Type. All Secondary Specimen Labels are pointers to the actual current location of the specimen.

Secondary Specimen Labels fall into two general groups; labels that indicate the specimen never resides in that position within the collection system (Oversize, Type, Permanent Loan); and labels that indicate the specimen is only temporarily removed from its normal position (Loan, Exhibit, Campus Research, Missing).

Secondary Specimen Labels are printed on colored paper. A different color is used for each of the seven labels. The purpose of the color coded labels is to make it easier to locate specimens when doing inventory or retrieving particular fossils from the collection. Every Secondary Specimen Label will have printed on it: Collection Acronym, Specimen Number, Specimen Number Suffix, the date the label was printed additional information as listed below.

Campus Research Label

This label indicates that the specimen has been borrowed for research or other approved purposes on the University of Texas or J. J. Pickle Campuses.

Research on Campus   1999 / 2000
Specimen #

Cabinet: Drawer:

Researcher: Email:

Loaned by:

Exhibit Label

This label indicates that the specimen has been borrowed for exhibit or other approved display purposes on the University of Texas or J. J. Pickle Campuses

Exhibit on   1999 / 2000
Specimen #:

Cabinet: Drawer:

Loaned for exhibit to: Loaned by:

Exhibit at:

Loan Label

This label indicates that the specimen has been borrowed for research or other approved purposes off of the University of Texas and J. J. Pickle Campuses.

Loaned on		**1999 / 2000**
Specimen #:		
Cabinet:	**Drawer:**	
Loaned to:	**Loaned by:**	
Loaner at:		

Missing Label

This label indicates that the specimen was not found during the most recent inventory

MISSING		**1999 / 2000**
Specimen #:		
Cabinet:	**Drawer:**	
Last recorded on:	**Last recorded at:**	
Absence noted by:		

Oversize Label

This label indicates that the specimen is too large to fit in its normal place within the drawer, and resides on a shelf or other place spacious or sturdy enough to hold it.

Oversize		**1999 / 2000**
Specimen #:		
Cabinet:	**Drawer:**	
Relocated to cabinet:	**Drawer:**	
Relocated by:		

Permanent Loan Label

This label indicates that the specimen has been loaned permanently to an institution. The state of Texas does not allow state property to be given away. Therefore, any specimens that fall under this classification are considered still to

be property of the University of Texas, but will never be requested to be returned.

> **<u>Permanent loan on</u>**   **1999 / 2000**
> **Specimen #:**
>
> **Cabinet:**   **Drawer:**
>
> **Loaned to:**   **Loaned by:**
>
> **Loaner at:**

Type Label

This label is created to indicate the specimen is classified in the Type series for the taxon. This means the specimen has been described, figured, or measured in at least one peer-reviewed journal, or other primary literature source.

> **TYPE**   **1999 / 2000**
> **Specimen #:**
>
> **Location in type collection:**
>
> **Cabinet:**   **Drawer:**

V. PRINTING INFORMATION BY HAND, CODES, AND ABBREVIATIONS

Printing legibly

Regardless of the type of information you are recording, whenever you print something on a label, a sheet of paper, or a note to be placed in a drawer, ALWAYS PRINT LEGIBLY. Here are some tips: Print, in all upper case letters; use script only if your handwriting is very very good; write slowly.

SIGN AND DATE EVERY NOTE you leave in the collection

Regardless of the purpose of a note, and regardless of the intended amount of time the note will be in the collection, ALWAYS PRINT YOUR LAST NAME AND AT LEAST ONE INITIAL, AND THE DATE YOU WRITE THE NOTE, ON THE NOTE ITSELF. Very often, a casual note to oneself ends up permanently attached to a specimen. Years from now another collections worker will try to decipher the meaning of your note. With a date and author printed on the note, the value or non-value of the note can be readily assessed.

PRINT ALL DATES IN THE SAME FORMAT, e.g. 01 Sep 1999

WHEN YOU PRINT THE DATE, USE THIS FORMAT: two digits representing the day of the month, the first three letters of the name of the month, 4 digits representing the year; e.g. 23 Aug 2000.

DO NOT use the following style; 01/09/99 or 01/09/1999 when printing the date. The problem with the all digit format lies in the fact that not everyone places the month and day in the same position. Does 01/09/1999 represent the ninth day of January or the first day of September? There are many International students and researchers who use the Non-vertebrate Paleontology Laboratory. While most people in the United States are used to printing the month followed by the day 01/09 = January 9; many other cultures read the same notation as the "First of September".   If you use the format 05 May 2000, there will be no question which is day and which is month.

DO NOT use a two digit year. By now you are no doubt aware of the computer problem with the year 2000. The same problem exists for written documents. The collections at the University of Texas are over 100 years old. In fact, as of the year 2000, these specimens will have been collected in three different centuries.   When you print new labels for specimens the date of collection and date of identification will appear on the labels. With a two digit system for the year there will be no way to know if '91 means 1891 or 1991; or if '03 means 1903 or 2003. If you use a four digit year there will be no confusion.

Exception to printing dates in the preferred format when using Microsoft Access

The program used to create the database is *ACCESS*. This program has a group of pre-ordained date formats from which to choose. These date formats are used in fields that are set exclusively to a Date format. This means the data must be entered in a prescribed form to this field. It also means this field may be searched for a specific date, or sorted chronologically. It therefore is necessary for all data in the field to be printed in an identical format. Unfortunately, the program does not offer the format described above as preferred for this collection, i. e. "01 Sep 1999". The closest approximation to this format allowed by the program is "09/01/1999". So when entering the date into the database you may use this format. However, if you print the preferred format, "01 Sep 1999", the program will read it and change it to "09/01/1999". You may wish to do this, since you will be less likely to make a mistake and reverse the day and month. You must leave single spaces between "01" and "Sep" and "1999". "Sep" will be read and changed to "09" whether you capitalize it, use all caps, or all lower case characters. NOTE: This format restriction only applies in Date fields. If you enter a date in any Text field, you may enter it in any format you choose. You should use the preferred format, "01 Sep 1999" in those fields.

Do not use abbreviations

Whether you are writing a casual note or filling in a label or chart, make it a habit to use full spellings of all words. Subsequent workers will be able to understand a note much easier if it is written without abbreviations. You may be in a rush when you write the note, but the extra time you take now to write out the words will save time later on, if others don't have to track you down and ask you what the note means.

Use complete sentences or phrases

As with abbreviations, single words almost never provide enough information to subsequent workers to understand the precise meaning you intend at the time you write the note. Make the note as understandable as possible to others. Be concise, yet pithy.

Codes

A.   Avoid the use of codes

Again, as with abbreviations, codes are very difficult to understand by persons not around when you write the note. Most codes require a key to understand the code. That key may disappear between the time you write the note and the time the note is read. *If you really need to use a cod*e, a key must be made readily and permanently available, and easy to decipher. If a code is used in a catalogue or on a database, the key to the code should be made readily available to all workers, and permanently printed in every volume of the catalogues, and on all databases, and other information resources that contain the codes. The code key needs to be updated regularly.

B. Acronyms as a special form of code

Acronyms are a special form of code. Most museums, universities, and other instituions are rampant with acronyms. These should be formed into a list and made readily available to all workers, and permanently listed in every volume of the catalogues, and on all databases, and other information resources that contain the acronyms. The acronym list needs to be updated regularly.

C. Personnel initials as a special form of code

Whenever you write a person's name, whether as collector, identifier, inventory taker, or researcher, the last name should be printed, with either the first name or at least one initial included.

Many previous record-keeping systems within this collection used the initials only, for everyone, regardless of their association with the collections.

Initials of fossil collectors, identifiers, researchers, collections workers, etc. present the same kinds of problems as acronyms or any other form of code. If there is no master list, subsequent workers will not know how to decipher the letters and will put a curse on your shade and your progeny. The names of all personnel associated in any way with the collection should be formed into a list and made readily available to all workers, and permanently listed in every volume of the catalogues, and on all databases, and other information resources that contain the initials. The personnel list needs to be updated regularly.

VI. THE COLLECTIONS AREA

Keeping it clean

A. Clean the general collections area

The floor and all horizontal surfaces in the collections area should be kept free of dust and dirt. This is an ongoing problem in building 33 due to the open nature of the collections cages and the daily truck and automobile traffic through the building. An effort should still be made to keep things as clean as possible. One good way to maintain a high level of clean, is to set aside one entire day every month or every two months for general cleaning. Have everyone attack the problem at the same time. Assign specific jobs to individuals, such as sweeping and mopping floors, vacuuming and wiping down horizontal surfaces, washing and drying plastic cover sheets, etc.

B. Tools to use to clean the collections area

Brooms and brushes should be used as little as possible as they tend to raise as much dust into the air as they gather on the floor. The best thing to use on the floor is a wet mop or sweeping compound and a dry mop, or a vacuum cleaner; on other horizontal surfaces, a moist cloth, tacky cloth, or vacuum cleaner should be used. If a moist cloth is used on a metal cabinet, the surface should be wiped dry so it does not rust or mildew. In particular, make sure the interior of a cabinet is completely dry before sealing it closed with the door.

C. When to clean cabinets, drawers, and specimen trays

Any time most or all of the drawers are removed from a cabinet, wipe clean all the drawer runners and vacuum out and wipe clean the bottom of the cabinet.

Any time a drawer is emptied of its contents, for any reason, such as consolidating specimens or shifting specimens to create space for middle-fill, clean the drawer both inside and out, clean the foam drawer liner.

Any time a specimen tray and specimens are removed from the drawer, remove the specimen, label, and foam liner from the tray, wipe or brush off the dust from all surfaces and replace the tray contents.

D.   Cleaning painted metal cabinets

On painted metal cabinets, mild, non-abrasive cleaning fluids or soapy water can be used with paper towels or a soft rag to clean the cabinet and drawer surfaces. Read the labels on cleaning fluids to find out what effect they may have. Test any product you are not familiar with on a small, out-of-the-way painted surface. BE EXTREMELY CAREFUL IF YOU USE ANY CHEMICAL SOLVENT TO CLEAN THE CABINET AND DRAWER SURFACES. ESPECIALLY BE CAREFUL WITH ACETONE, and even Alcohol may remove or dull the paint.

E.   Cleaning wood cabinets

On wood cabinets use Pledge, or other brand, wax base cleaner. A pump bottle is desirable from an environmental standpoint, but spray cans can also be used. Avoid using water on wood, no matter how badly weathered or deteriorated the finish is. The water will make the wood swell and promote deterioration of the finish.

F.   Clean cabinets, drawers, and specimen trays

Cabinets, drawers, and specimen trays will always have some dust, sediment, or matrix sloughing from the specimen, or powdered paint and metal shavings caused by the action of the drawers sliding over the runners. When cleaning any of these objects thoroughly wipe all surfaces, top, bottom, sides, inside, outside, front, back, underneath, etc. It often helps to turn the drawer or tray over and tap the bottom to remove loose dust before wiping the surface, to prevent scratching the surface by dragging grit across it. All surfaces should be wiped because dust adheres to vertical surfaces as well as upside down surfaces. As a standard, just clean everything you see and everything you don't see.

G.   Cleaning paper trays and other specimen containers

Methods and tools for cleaning paper trays and other specimen related containers are described under Protocols for Conserving Specimens

VII. PROTOCOLS FOR CONSERVING SPECIMENS

THE WORK AREA FOR CONSERVING SPECIMENS

A.   The floor covering

The floor should be a hard smooth surface (concrete or linoleum). Carpet tends to hold a lot of dirt, and fossils that are dropped, especially tiny ones, can become lost. Also, do not work directly above or too near large cracks or expansion joints in the hard floor surfaces for the same reason.

A cleaning surface, such as a cafeteria tray, where specimens can be cleaned and the residual dust and dirt can be isolated and easily removed;

B. The work surface

A work surface, such as a table, where the worker can sit comfortably for several hours at a time, with ample space for the specimen and with all the cleaning materials easily accessible;

The work surface should be covered with a layer of foam to protect any fossils or pieces of fossil that are inadvertently dropped during cleaning;

EQUIPMENT

A. Lamps

A table lamp for close work and reading printed material;

B. Microscope and loupe

A dissecting microscope and 10x loupe for deciphering cryptic printing or other close work;

C. Recycle receptacle

Recycle receptacles for reusable plastic bags and trays. These will multiply rapidly as the specimens are cleaned, so must be culled regularly.

D. Trash receptacle

A trash receptacle for excess dirt and discarded notes, plastic bags, and trays. IMPORTANT - DO NOT SET THE TRASH CAN NEAR THE EDGE OF THE TABLE. Labels, tools, and even fossils can inadvertently be brushed into the trash can without being noticed. Ideally, set the can across the aisle from the work table. Alternatively, set the can under the table, but make sure it does not migrate near the table edge;

E. Vacuum cleaner

A hypervac vacuum cleaner, which minimizes primary as well as secondary dust (very fine dust emitted through the filter of standard vacuum cleaners), plus multiple attachments, especially a round horsehair brush attachment and a small aperture wand attachment;

TOOLS

A. Brushes

Various horsehair and camelhair brushes for cleaning specimens and labels;

B. Pens and ink

Archival quality ink pens of various point sizes. India ink and quill pens are acceptable, however felt tip pens are easier and less messy to work with. A good quality, often-used brand name is Pigma. Current (16 Aug 1999) availability at most local campus related bookstores and art supply stores, cost between $2.00 and $3.00. Standard label writing pen point sizes are 01 and 02, while 005 is ideal for printing labels for 1/2 dram vials or printing specimen numbers on specimens as small as 1 or 2 mm, 05 or 08 is sometimes preferable for printing numbers on very large specimens or very large labels;

MATERIALS (consumables)

A. Gloves

Disposable white cotton gloves or latex or vinyl gloves, to protect the specimens from body oils and perspiration on the hands of the worker, and to protect the worker from the dehydrating and irritating effects of the dust and specimen matrix.

B. Label base coat

A white base-coat for printing specimen numbers on specimens. White Acryloid B-72 lacquer, in acetone 25% solution is currently being used. Other acrylic gesso type products are available through archival supply companies;

C. Label cover coat

A clear cover coat for sealing specimen numbers printed on specimens. Clear Acryloid B-72 lacquer, in acetone 25% solution is currently being used. Other clear sealant coat products are available through archival supply companies;

D. Particle masks

Particle masks for personal protection from airborne irritants stirred up during cleaning of the specimens. These should always be available. If you can not find any, ask the Collections Manager or Supervisor;

E. Preprinted labels

An ample supply of blank Inventory Labels; These labels list information about the physical location of the specimen immediately prior to the current cleaning and re-curation project.

F. Specimen bags

Multiple sizes of zip-lock storage bags, the smallest should be 2x3 inches. The Conservator Labels are designed to fit easily into these 2x3 inch bags.

G. Specimen trays

. Multiple sizes of specimen trays, the smallest should be 2x3 inches. Isolated specimens or specimens in small vials or trays smaller than 2x3 inches should be placed in a 2x3 inch tray. This allows for a standardized specimen label that will fit in every size of tray in the collection. Also this prevents the misplacement of very small items inside or between other trays.

H. Specimen vials

Multiple sizes of glass and plastic vials, 1/2 dram, up to 40 or 50 drams or larger. The smallest vial size should be no smaller than 1/2 dram. This is about the smallest size object that will not be lost easily if it accidentally pops out of the tray

I. Writing paper

A pad of writing paper for taking notes and other printing needs.

VIII. ORGANIZING SPECIMENS WITHIN THE COLLECTION

Discussion of organizational styles

Collections of fossil specimens can be organized in any of several different ways. Small, personal size collections (usually less than several thousand specimens) are often organized taxonomically. This makes it easy for the researcher to locate groups currently under study. As the collection grows, and as other collections are added to it the taxonomic organization begins to break down. This is particularly true with taxa that undergo revision. If specimen identifications are changed to a different species or genus or family group the specimens must be moved physically to the section of the collection where the other group resides. In large collections this can quickly become a logistical and record-keeping nightmare. Other organizational styles (e.g. grouping by locality, horizon, collector, or by year of collection) can suffer from similar types of problems as the collection grows.

The simplest (ideal) way to keep track of specimens is by assigning a whole number to an individual specimen. The first number in the collection should be 1. Each subsequently numbered specimen should have the next unused number. An infinite number of numbers are available, each of them unique. With the availability of digital database systems, keeping track of specimens by the unique number is a very simple matter. All data about the specimens is stored in the database. If a specimen is separated from a batch catalogued group of specimens, the next available specimen number is assigned. The separated specimen may reside in a different drawer than its former mates, but they can be brought back together with no trouble. Simple or complex queries can be run to locate specimens based on taxonomic identity, locality, collector, formation, etc. If the specimens are organized simply, by number, they can be retrieved quickly. Hundreds of specimens can be located within a very short time. Collection workers and researchers can be taught the system easily.

With established collections it is often necessary to forego the ideal organization and utilize, at least in part, the system that is already in place. The current re-organization and upgrade of the collections by the NPL will be a combination of the newer, simpler database driven style overlain on older organizational systems. There may be some inconsistencies in numbering or specimen organization. Please bear with us as we try to iron out the conflicts.

There are many ways specimen trays may be sequenced within a drawer. They may be organized to read like an english book, beginning with the lowest specimen number at the back (or top) of the drawer, with increasing numbers reading left to right, and forming rows of increasing numbers from back to front. They can also be organized to read from the front, left to right, forming rows from front to back. Each style of organization has its own logic. Some styles may have more positive or fewer negative aspects than others. The main point is that the organizational system is consistent throughout.

IMLS Organization

Invertebrate specimens from Cretaceous localities in central Texas are organized utilizing a series of nested criteria

A. Specimens organized by Texas Cretaceous fossils

The coarsest level is the group of cabinets set aside for Texas Cretaceous fossils. This group of cabinets is currently (21 July 1999) in the Southwest Cage of Building 122 on the J. J. Pickle Research Campus.

B. Specimens organized by Texas Counties

The next level is the County in which the fossils were collected. This information will be found as a label on the cabinet door. Counties are organized alphabetically.

C.   Specimens organized by stratigraphic unit

After the county name, the fossils are placed in stratigraphic sequence, with the youngest formations (stratigraphically highest) in the first drawer of the cabinet, and subsequent formations below the first.

D.   Specimens organized by specimen number

Within the stratigraphic sequence, specimens are arranged by specimen number. This includes the prefix, if one is present. Most prefixes are collection acronyms consisting of two or three letters. Specimens without a prefix will be placed ahead of specimens with a prefix. Prefixes beginning with a number will be placed ahead of prefixes beginning with alpha characters.

Putting specimens away

A.   Placing the specimen in a tray

The specimen should be placed in the smallest tray possible, with the following proviso: The specimen should not touch any of the sides of the specimen tray. If a specimen tray is too small, the sides of the tray may abrade or otherwise damage the fossil, or the fossil may break down the tray. If the tray is too large, much needed drawer space is wasted and the fossil looks as if something is missing, or the fossil may roll out of the tray when it is transported.

B.   Placing specimens in the drawer

Due to the great variety in specimen shape and the resultant tray sizes, it is often difficult to organize a group of specimens in a regular and consistent manner. This is one place where a great deal of latitude must be expected if the collections worker is not to go completely mad. Therefore, not every drawer will look exactly the same. In some drawers, it is advisable to allow anywhere from 10 to 50% empty space to be retained for future middle-filling with specimens not yet re-curated, or with potential new specimens collected from old localities. At other times, the drawer will have to be organized in such a manner to utilize every square cm available. Following are several suggestions about positioning and orientation that may help make the drawer organization consistent, if not perfectly uniform.

Space around trays

Specimens in the drawer should be placed in such a manner to make location of the specimen swift and easy. The specimen trays should be easily removed from the drawer, i. e. they should have a small amount of space between trays. They should not be jammed together in such a manner that removal of one tray causes several others to jump up and scatter their contents.

Sequence of trays in drawer, front to back, forming columns left to right

Specimens should be placed in the drawer beginning with the lowest specimen number in the front left of the drawer. Subsequent numbered specimens are placed in a column behind the first specimen. When the first column is filled, the next specimen is placed to the right of the first specimen at the front of the drawer, beginning a new column. Subsequent columns are filled to the right, in the same manner as the first, until the drawer is full.

Separator strips between columns of trays in drawer

Columns of specimens may be separated by a low, narrow strip of plexiglass or other archival material. Columns separated in this fashion are much easier to keep organized. Specimens are very easy to locate when divided into columns.

<u>Alignment of columns of trays in drawer</u>
The left hand edge of the trays in a column should be aligned. This can be done by pushing all the trays in a column against the Plexiglas divider strip.

<u>Positioning of various size trays in the same column</u>

Ideally (if all specimen trays are the same size), each column will be one tray wide. However, there will, more often than not, be large trays mixed with small trays in any sequence of specimen numbers.

<u>Sub-columns of smaller trays mixed with larger trays in the drawer</u>

If the width of the larger tray in a column is sufficient, one or more sub-columns of smaller trays may be abutted to the larger one, either before or after the larger tray. If this is done, the numbering sequence should be as follows:
The left hand side of the first, or primary column is a continuous series of numbers, including the oversize tray. The left hand edges of all trays and labels in the first or primary column should be aligned with the first tray in the column. The second, or sub-column begins as near the front of the drawer as space allows.
Trays in this second or sub-column are placed (numerically) sequentially after the first tray in the sub-column. If there is space to continue the sub-column on the far side of the oversize tray, continue to place trays in the sub-column until there is no more room. Continue the number sequence in the sub-column as if the oversize tray was not present. All left edges of trays and labels in the sub-column should be aligned with the left side of the first tray in the sub-column.

<u>Anti-rolling orientation of vials in drawer</u>

All vials should be positioned with the long axis of the vial aligned with the direction of motion of the drawer. This minimizes the rolling action of the vial caused by the opening and closing of the drawer. The less the vial moves, the less the fossil inside it will be subjected to damage caused by rubbing or repeated minor impacts as the fossil falls over against the vial wall, or falls against another fossil.

If a vial will only rest in a tray with its long axis parallel with the long axis of the tray, the tray should be placed in the drawer with the tray long axis aligned with the direction of motion of the drawer. In particular, if a vial will fit in a 2x3 inch tray, but is longer than 2 inches (i.e. will not fit across the short dimension), the tray should be placed with its long axis parallel to the drawer motion.

C. <u>Primary Specimen Label holder</u>

The Primary Specimen Label holder is a mylar folder. Place the Primary Specimen Label in the folder, with the top of the label against the fold. Cut the mylar folder to the same width as the Primary Specimen Label. Cut the mylar folder so it is longer (top-to-bottom) than the Primary Specimen Label by 1 1/2 inches. Fold the mylar folder at the bottom of the Primary Specimen Label. The fold should form a base 90° to the label. Position the base of the mylar folder in the bottom of the specimen tray. Place the foam tray liner on top of the base of the mylar folder. The result should be a Primary Specimen Label standing up at the back of the specimen tray, sandwiched by the mylar folder.

<u>Placement and orientation of the Primary Specimen Label in the tray</u>

The preferred orientation for all Primary Specimen Labels is with the printed side toward the front of the drawer. When anyone opens the drawer, all the specimen labels are immediately visible.
If, for any reason, the label must be turned sideways, the printed side should face to the right.
This allows for all turned labels to be viewed from one position.

The Primary Specimen Labels should be placed at the left edge of the tray. This will make all the specimen labels in a column appear one-behind-the-other. The specimen numbers and other label information will be much easier to scan visually when searching for specific numbers or data. The labels will be easier to scan with the bar code reader when the labels are lined up in a column.

D. Placement and orientation of Secondary Specimen Labels

Secondary Specimen Label is placed behind the Primary Specimen Label, with the printed side facing toward the back of the drawer (in standard tray and specimen label orientation), and upside down. This allows the researcher or collections worker to read the Secondary Specimen Label by tipping the mylar folder with specimen labels forward and down. The mylar folder and with labels is very flexible, therefore the action of tipping the mylar folder will not disturb the specimen or tray.

E. Splitting specimens from a single tray

procedure yet to be developed

F. Providing middle-fill space for unprocessed fossils

Suggested: Until the entire collection has been re-curated, ample space should be left in each drawer for middle-fill addition of specimens. A minimum of about 10% of the drawer should be left empty for the additions. In some cases extra drawer spaces, or entire cabinets must be left vacant for larger groups of fossils not yet processed. This may be more easily determined once all the catalogued specimens have been entered to the Catalogue Fossils database.

IX. ARCHIVAL MATERIALS

How do we obtain Archival Quality materials?

There are several companies that distribute materials through catalogues.

WHAT SHOULD BE DONE WITH NON-ARCHIVAL QUALITY MATERIALS?

A. Wood

Wood materials should be removed from the collection as soon as economically feasible. Wood and paper are biologic products and can react with the specimens by producing reactive gases or resins. They can also provide habitat and sustenance for damaging insects, fungus, and other life forms. Most of the cabinets currently (August 1999) in use are made of wood. These will remain in use until new cabinets can be purchased.

B. Paper

Paper is a wood product and has most of the potential damaging qualities of wood. Acid-free paper eliminates many of the reactive problems of wood. Most original documents, including labels, catalogues, letters, and photographs are not made of acid-free paper. These documents are currently in various stages of disintegration. The conservation steps, especially cleaning and placing labels in sealed plastic bags, will slow down the disintegration, although it won't stop it. Removing the documents to a filing system in a controlled environment will help protect them further.

C. Cotton and other fibrous materials

Natural and synthetic cotton and other batting type fibrous material should be removed from the collection. The spaces between the fibers become traps for the accumulation of dust, and habitats for insects and other damaging life forms. Most of these types of material break down after a few years and begin to disintegrate, leaving small hairs and fibers all over the bottom of the tray and drawer. All fibrous materials should be removed from the collection.

Cotton and fibrous materials are often used as cushion material in the bottoms of trays. These will be replaced by the foam tray liners.

Cotton is also used as a stopper and cushion for small specimens in vials. These are often placed above and below a specimen in the vial. A major problem with fibrous materials used in this manner (in addition to the problems mentioned above) is the fibers themselves. These often are hooked by small projections on the specimen. When removing the fibrous plug, the specimen may be caught and flung, inadvertently, across the room. The fibrous plug may also shrink and fall out of the vial, jeopardizing the specimen. The cushioning cotton can be replaced with a small strip of Ethafoam® placed above and below the specimen. The vial should be sealed with a plastic cap that will not fall out of the vial.

D. Foam

Most types of foam are manufactured with pore spaces open on all surfaces. These become traps for the accumulation of dust, and habitats for insects and other damaging life forms. Most foams break down after a few years (some do so immediately) and begin to disintegrate, leaving small bits of plastic and rubber all over the bottom of the tray and drawer. All foams other than the archival quality Ethafoam® or its equivalent should be removed from the collection.

E. Cork

Cork, used extensively as a common vial stopper, is made from the bark of cork trees. It is therefore a wood product, and will cause many of the same problems as other wood materials. In addition, cork eventually dries out, shrinks and no longer seals the vial, or can fall out of the vial. It also becomes brittle, and can disintegrate. Cork stoppers should be removed from the collection. Alternate archival quality stoppers are commercially available.

MAKING FOAM LINERS FOR TRAYS AND DRAWERS

A. Foam liners

All drawers and specimen trays will be lined with polyethylene Ethafoam®or equivalent foam padding. This is an archival quality plastic foam. The surface of the foam has no openings, so dust and insects cannot accumulate easily inside the sheets, as with other types of foam. The foam sheets are also easily cleaned, usually with soapy water and a rag, or by immersion in soapy water.

B. Consistent sizes of tray and drawer liners

To facilitate the production of foam liners and to make them consistent in size and shape, templates should be created. The templates should be of a rigid or semi-rigid material that will withstand the production of several thousand liners.

C. Designing foam liners

The following procedures follow Brinkman, Paul 1999. Score! A method for constructing improved polyethylene liners for specimen trays. Collection Forum, 13(2):90-92.

One of the unique features of Brinkman's method is creating foam liners that cover the walls as well as the floor of the drawer or tray. To create the wall covering, the foam liner is expanded in area and scored at the fold between the wall and floor of the liner. This creates a sharp angle and maximizes the use of the space in the tray and drawer. It also eliminates the creation of rounded void spaces beneath the liner, where bugs and dust can accumulate. Scoring involves making a cut approximately 1/2 way through the foam, along the length of the fold.

D. Templates for cutting foam liners

Measure the dimensions (side-to-side and front-to-back) of the bottom of the drawer or tray to be lined. Measure the height of the walls of the tray or drawer.
Use inside dimensions of the containers.

Select a relatively stiff material for a template (masonite works well; plexiglass might also work). This will be used to lay over the foam sheet and cut the outline of the tray/ drawer liner.

Draw a rectangle on the masonite, using the dimensions of the tray/ drawer floor (bottom). To each of the four sides of the rectangle, append a rectangle extending out the same distance as the height of the tray/ drawer wall. The drawing should now resemble a tray or drawer with its walls flattened out into the same plane as the floor of the tray/ drawer.

Carefully, cut out the template shape along the outlined figure. The easiest tool to cut masonite is a power saw. Either a circular saw or table saw will work. If you are not familiar with power tools, have someone who knows how to operate them cut the template for you. DO NOT operate power tools when you are alone. (see Health and Safety; Power tools)

Make fine adjustments to the template by cutting some sample foam liners using the new template. If the template is a little too large, trim the sides equally until the correct size is obtained. Try not to cut off too much.

E. Template for scoring drawer foam liners

For scoring the foam liners of drawers, an additional floor template should be cut out. This template is drawn exactly as the first part of the templates above. It is only the outline of the floor of the drawer, so does not require the walls to be added.

F. Cutting foam liners

Select a template for the tray size or drawer for which you wish to create a liner.

Select a piece of foam that is larger than the template on all sides.

DO NOT CUT FOAM WITHOUT PROTECTING THE TABLE TOP FROM DAMAGE. Glass is one of the best surfaces for cutting foam. There is a large piece of glass on one of the tables in Building 122.

Make sure there is nothing under the foam. You don't want to accidentally cut something that should not be cut.

Position the template on the foam. You may be able to minimize wastage by positioning one or two edges of the template at the edges of the foam.

Use a sharp knife. The best knives for cutting foam are X-acto® knives or surgical scalpels. These can be kept very sharp by honing them on the whetstone. The sharper the knife is, the better it cuts the foam. Avoid slicing off body parts whenever possible.

Cut along the edges of the template.

G.   Scoring drawer liners

For drawer liners, center the floor template on the liner and make a scoring cut around the edges of the template. One technique that works reasonably well for maintaining a constant depth of cut is the following. Place the thumb of the hand holding the knife on the edge of the template. As you draw the knife down the edge of the template, you can hold the point of the knife at a constant depth. It is not an exact procedure. The depth of the scoring cut still will vary greatly. If the cut does not score the foam along the entire length, retry scoring the section that is uncut. If the cut goes all the way through for part of the length of the cut, the liner is still usable. If the scoring cut actually removes one of the walls of the liner, that liner should not be used. Recycle the foam and try again.

Do not use tape to patch bad scoring cuts.

H.   Scoring tray liners

For tray liners, a metal straight-edge is a good cutting guide. There are several metal rulers in Building 122. Align the straight-edge where you will fold the tray liner between the floor and walls of the tray. Score the foam as in Scoring drawer liners, above. Score all four sides of the liner.

I.   Placing the liners in trays and drawers

When placing a liner in its container, orient the scored side of the foam down. This will allow the walls of the liner to form 90 angles with the floor of the liner.

J.   Recycle all foam

All pieces of foam that are large enough to cut out the smallest liner (the 2"x3" liner templates) should be saved until they can be cut. Therefore, don't panic if you screw up a drawer liner. That foam will still get used. Any foam pieces smaller than that size can be discarded.

K.   Perfect foam

If possible, don't use foam liners with tears or holes in them. Recut the damaged foam for smaller liners and make a fresh liner for the size you are working on.

STABILIZING DETERIORATING SPECIMENS

Protocol yet to be determined

RECORDING AND CURATING SPECIMENS WITH PROBLEMATIC PROVENENCE

Protocol yet to be determined

STABILIZING AND RECORDING DETERIORATING LABELS

Protocol yet to be determined

IMLS PROJECT PROCEDURE DETAILS

A. Catalogue Inventory (table)

All information currently stored in catalogues must be transcribed to the database table titled "Catalogue Inventory". There are several primary catalogues in the collection, each with very similar information, presented in very similar formats. Catalogs are in building 122. In general, copy the data as is, including errors. The information in the completed database should be as close to an exact replica of the catalogues as possible. If you feel a word or character is in error, is misspelled, or is otherwise incorrect, enclose it in brackets [ ].

The following fields will be filled, when possible, from the catalogue data:

> Building This field contains the building acronym and building number in which the fossils are housed at the beginning of the IMLS project.

> Specimen Number This is the specimen number of the individual specimen. This is a number field, so the number must have no alpha or non-numeric characters within it.

> Suffix This is the second part of the specimen number. This sub-specimen number often is used to give individual specimens from the same locality unique identities. The default for this field is a decimal point. If there is a sub-specimen number, it is printed as a decimal point followed by a sub-specimen number. The default for this field is a decimal point.

> Taxon The taxonomic identification of the specimen, including original taxon citation (author and date).
> > Example: Enallaster texanus Adkins 1920

> Horizon This field contains information copied as is from the catalogue. The information for this field includes age, formation, member, and any other data related to stratigraphic position or geologic age of the specimen locality.

> Formation This is the standardized formation name, as currently listed in the Central Texas Cretaceous Section (prepared by Ann Molineux 07/08/1999). Modifiers such as LS, limestone, shale, SH, etc. are not included in this field, only the primary name.

> Member This is the standardized member name, as currently listed in the Central Texas Cretaceous Section (prepared by Ann Molineux 07/08/1999). Modifiers such as LS, limestone, shale, SH, etc. are not included in this field, only the primary name.

> County This field contains the county name where the fossils were collected. The word "county" or "Cty" or "CO" are not included in this field, only the primary county name.

> Type status Type status is the classification of specimens that have been identified and described formally in a publication, or their identification is associated directly with specimens from those publications. There are several "type" categories. Each category is indicated by a single word. This word always has the suffix "type", such as Holotype, Paratype, Syntype. For consistency, always capitalize the type classification.

> Collector Collector is the name or names of the person(s) who collected the specimen. If the full last name of the collector is known, that should be printed in this field. Only print all initials when the last name is not known.

B. Pulling fossils and transporting then to the sorting area

This describes how you pull fossils from the East cage, fill out conservator and specimen moved labels, and transports specimens to Southwest cage for cleaning and filing.

Inventory

There is an inventory which shows the cabinet and drawer number, specimen number, county and formation. This Inventory is made in Microsoft Access and combines the information from Catalog Inventory and Inventory Specimens.
This inventory lives on the Inventory clipboard and is updated periodically. Only one hard copy should be printed at any time.

If many updates have been made to the inventories then it may be time to print a new copy. This will probably be done every week or two.

Check with collections manager or supervisor before printing out a new inventory.

Printing the Inventory

Print out a hard copy of specimens that are ready to be moved to the sorting area
On the database, open the Queries tab
Open the query Fossil-Catalogue Worksheet. This query compares the Fossil Inventory table and the Catalogue Inventory table and looks for two things; specimen numbers that appear in both tables, and specimens that have "No" in the field Specimens Moved. This gives you the specimens that still remain in the East cage and can now be pulled and transported to the sorting area in the Southwest cage.

The query should also list the specimens in an order that makes it easy to search. The specimens should be listed by cabinet, then by drawer within cabinet, then by collection acronym, then by specimen number, then by suffix.

Before you print the database document you should preview it to see that it will print the way you want it to print. You may have to change some of the print settings or you may have to adjust the layout of the datasheet or query before running off a copy.

Under File on the main menu select Print Preview.

Look at the bottom of the preview screen. There will be a small window with the number "1". This is the page number of the document that is currently displayed on the screen. Scroll through the document by clicking on the left-right arrows on either side of the page window.

If the table will fit across one sheet of paper

If the table structure on page 2 is identical with that on page 1, i.e. if all of the fields you see on page 1 are repeated on page 2, and in the exact same positions, the pages are identical in structure. The document will be printed on successive pages.

Select Print in the File Menu. The document will be printed

If the table is too large to fit across one sheet of paper

If page 2 is different from page 1, but page 3 is identical to the structure on page 1, then the document will be printed two pages at a time, with successive records beginning on every other page. In other words, the datasheet is too large to fit all on one page and will overlap onto the second page. The datasheet may cover any number of pages across before it continues to the next succeeding record.

The problem is that based on the print area assigned, the table is too large to fit across ne sheet of paper. You may be able to remedy this either by enlarging the print area assigned to the printer, reorienting the printing from Portrait to Landscape, or by reducing the physical width of the table.

Enlarge the print area Under File on the main menu, select Page Setup. Select the tab Margins. In each of the windows, Top, Bottom, Left, Right, change the number to 0.5 inches. This reduces the size of the blank margin around the outside of the page to 0.5 inches on each of those sides. The printer can not print in margins less than 0.5 inches, so don't bother changing the number to 0.25, etc. This in effect, enlarges the printed area by 1 inch from side to side and from top to bottom.

To reorient print direction You can also make the printed width wider by changing the printing orientation. Still under File, Page Setup, select the Paper Size tab, then select the Landscape button. This will cause the printer to print the document parallel to the long axis of the page.

NOTE, if you change the Paper Size orientation, recheck the Margins settings. The settings stay with the side of the paper at which they were originally set. When changed from Portrait to Landscape orientation, the page is rotated 90° clockwise. That is, if in Portrait orientation you set Top at 1" and Left at 0.75", when you change to Landscape orientation, the Right will now be 1" and Top will be 0.75".

Change Datasheet Layout, vertical column, field widths Another way to change the width of the table, as printed, is in the query itself. Under View on the main menu, select Datasheet. This will take you back to the query. At the top of the grid, where the field names are, move the cursor until it becomes two vertical parallel black lines with arrows pointing away from each other. This indicates that you can now change the size of the visible column. This is not a permanent change to the table, so don't worry that you may be screwing up the database. It is only a way to minimize the objects on the screen, or to open them up wider. You can change the width of all the fields in this manner. It is convenient way to get rid of a lot of empty space, or to reduce fields you don't need to almost nothing.

Change Datasheet Layout, horizontal row, record heights You can also change the apparent height of the rows by moving the cursor to the far left gray column. Again, move the cursor until you get two parallel black lines with arrows pointing away from each other. You can make the individual records as tall or short as you want. The only difference here is, you adjust the heights of all the records at the same time, whereas you can adjust the width of each field separately.

Check the revised layout When you have adjusted the field widths and record heights to the point you desire, go to Print Preview and see if the document looks the way you want. If it still needs work, click on Print Preview again. This will take you back to Datasheet. Make adjustments until you get what you want.

Closing the query, choosing "Yes" or "No" to "Save Layout" When you close a query, you will be asked if you want to save changes to the layout of the query. If you select "Yes", the next time the query opens it will look the same way as it does when you close it. If you select "No", the next time you open the query, it will look the same way it did when you opened it this time.

Print the query by selecting File, Print. In the Print window, select OK.

Take the current Fossil-Catalogue Worksheet printout to Building 33.

Find the specimens listed on the Fossil-Catalogue Worksheet printout.

Specimens Moved Label

Fill out each of the headings as follows: County, this will be obtained most often from the worksheet printout, Formation, this will be obtained most often from the worksheet printout. Cabinet, the number of the cabinet

Drawer, the number of the drawer. If the drawer also has a cabinet number different from the number on the cabinet in which the drawer now resides, record the drawer number as (cabinet number on drawer/ drawer number on drawer). Also make a notation in the worksheet printout for each specimen in this drawer, that the drawer is in a different cabinet than that listed on the drawer.

Name, the name(s) of the person(s) pulling the specimens, include one or more initials and full last name.

Date, the date on which the specimens were pulled and transported to the Southwest Cage. Use this format, 24 Aug 1999.

Specimen Number, the specimen number as found on the specimen and in the worksheet printout.

Printing multiple specimen numbers on the Specimens Moved Label

To save time and to cut down on little pieces of paper in the drawers, it is advisable to print multiple specimen numbers on the Specimens Moved Label. This should be done in the following manner:

Only print multiple specimens that come from the same drawer on the same Specimens Moved Label. Use different labels for different counties, formation, days moved. a different Specimens Moved Label. Separate multiple specimen numbers in a list with a comma. Include the collection acronym at the beginning of the specimen number.

Do not mix specimen numbers with different acronyms, unless each separate number is preceded by its acronym.

If possible, it is best to list all specimen numbers in ascending numerical order.

If there are a large number of specimens (e.g. in excess of 5), don't put some on the front and some on the back. Just print "over" at the bottom of the front of the label, and print all the numbers, in neat columns on the back.

Place the Specimens Moved Label in the drawer from which the fossil was removed

Place the Specimens Moved Label in a 4"x 4" plastic zipper-bag. Place the bag and label in the drawer where the specimens last resided. If there are several Specimens Moved Labels in the drawer, place them all in a single, larger zipper-bag. This will prevent them from becoming separated and lost.

Transport the pulled specimens to the Southwest Cage

The pink cafeteria trays and rolling metal rack can be used for transporting specimens from the East Cage and Northwest Cage to the Southwest Cage.

Sort the specimens by county

Place the pulled specimens on the sorting shelves under their appropriate county name. The county names are printed on large yellow labels at the top of the sorting shelves in the Southwest Cage.

X. CONSERVING SPECIMENS

Cleaning and re-using specimen trays

Deteriorated, bug-damaged, broken, or otherwise damaged trays should be removed from the collection. Trays that are any color other than black should be removed from the collection. Trays that are still in good physical condition should be cleaned using the same tools and techniques as for fossils. The brush attachment for the hypervac is of particular help to remove crusted dust. Printed characters found anywhere on the tray must be crossed out with a Sharpie® or other permanent marker. Preferably, use a marker that will cover the characters completely. This will ensure that no one will mistake any marks on the tray as referring to the specimen in the tray. Place a foam tray liner in the tray. Place cleaned foam-lined trays neatly in boxes labelled according to tray size. If multiple boxes are filled with cleaned trays, seal, or otherwise cover the boxes that are not going to be used immediately.

Some damaged trays and undamaged non-black trays may be used outside the collection for other projects. Ask the Collections Manager or Supervisor what to do with them.

Cleaning and re-using plastic zipper bags

Bags that are badly discolored, very dirty, torn, have holes in them, do not hold air when zipped closed, or have a lot of printing on them should be discarded. The purpose of the bags is to keep out dust (for which the zipper is not critical) and to keep out bugs and moisture (which requires a tight zipper closure). The bags should be cleaned easily in warm soapy water and hung up to dry. Be sure the bag is completely dry before re-using. If the dirt does not clean out readily, discard the bag. Marks on the bag, especially from marker pens can often be removed quickly by wiping with a cloth soaked in alcohol. If the marks do not come off readily, you should discard the bag. Look carefully at the bag after cleaning off marker pen marks. Especially Sharpie® brand marker ink tends to bleed into the plastic, and even though the surface ink comes off the characters can still be read in the plastic. If these marks cannot be thoroughly removed the bag should be discarded. If that bag is re-used with a different fossil, a future worker may mistake those marks for information associated with the current fossil and think the ink merely faded away.

Some damaged and marked bags may be used outside the collection for other projects. Ask the Collections Manager or Supervisor what to do with them.

Organizing the supply area

The following suggestions will allow any worker to walk up to the supply shelves and find the desired object with a minimum of effort and frustration, and when in a hurry, a minimum of cursing.

The shelves where extra bags, vials, and trays are stored need to be kept clean and orderly. All materials should be kept in boxes or containers according to type of material and size, e.g. trays; 2"x3", 3"x4", 4"x6", etc., vials 1/2 dram, 1 dram, 7 dram, 30 dram, etc.; bags 2"x3", 4"x4", 4"x6", etc. Each box or container should only contain one tray, vial, or bag size. The box or container holding the materials should be clearly marked, preferably in bold black marker ink or large label, with the material type, e.g. "Trays" and the size, e.g. 2"x3". Either mark all four sides of the box or make sure the marked side is always facing out when placing it back on the shelf. Keep all materials of a type together and in order by ascending or descending size. At any given time, only one new box of each material type and size should be opened. This will help keep the unused materials free of dust. Use up cleaned recycled materials before using new materials. This will keep down the quantity of opened boxes of materials. Whenever possible, store unopened boxes of new material directly behind, or next to opened boxes of the same type and size.

This will facilitate inventorying, especially when putting together a new materials order list. Make sure the dust protection for the materials shelves (e.g. plastic sheet) is in place.

It is not absolutely necessary to be meticulous about the materials shelves. But the more often you can tidy up the area and keep it organized, the less time will be spent pawing through boxes of mixed multiple bag and tray sizes. You will be able to use the correct size tray or bag or vial nearly every time, and your collection will be much happier.

Plastic dust cover sheets

A sheet of plastic or some other cover to protect the work surface or projects-in-progress from dust when not in active use is desirable. These sheets of plastic themselves become crusted with dust and dirt over a short amount of time. Most can be cleaned readily in a bucket of warm soapy water. Rinse them thoroughly with clean water. Hang them up to dry, and re-use them.

The work area must be maintained clean of dust and dirt.

Before working on the specimens, thoroughly wipe and vacuum the work area, this includes the floor immediately under and around the work area. (If anything is inadvertently dropped it can be found more quickly on a clean surface.) A vacuum cleaner and a damp or tacky cloth are preferred over sweeping, in order to minimize airborne dust particles that settle back onto previously cleaned specimens. If a damp cloth is used, be sure the work surface is dry before placing the specimen on it. [*In general, DO NOT let moisture touch the specimen, either by wiping with a damp cloth or by dripping or spraying liquid directly on it. Many specimens have clay in them or other minerals that may react with the water by swelling or advancing oxidation of the matrix or the specimen itself.*]

Cleaning specimens

Before touching the specimen, determine by visual examination whether handling the specimen will cause it damage. Many specimens are actively deteriorating in their trays for various reasons, some are being hydrated and desiccated by large fluctuations in humidity, causing expansion and/ or contraction, which in turn causes the specimen to fracture, and in some instances to turn to powder. Other specimens are forming crystalline precipitates due to oxidation or other reactions to the uncontrolled environment in the storage facility. If a specimen is in bad condition it must be stabilized before further work can be attempted on it. See the section on Stabilization of Deteriorating Specimens.

If a specimen is solid enough to withstand handling without damage, proceed to the next step.

Cleaning specimen labels

Remove all labels, notes, and tags from the specimen tray. If the paper is brittle, carefully remove the label with a pair of Forceps. If the paper is falling to pieces, stop the cleaning procedure and go to the section on Stabilization of Deteriorating Specimens. If the paper can withstand cleaning, gently clean the dust from both front and back surfaces of each label, note, etc. Use only a brush for this step. DO NOT use a vacuum cleaner on the labels. They may be destroyed or sucked into the mechanism. DO NOT throw away any paper scraps that are in the specimen tray. Even a simple check mark or colored pencil mark on a piece of paper may have some curatorial significance that may be decipherable with the right documents. Notes and background information that is filed on computer or in catalogue or other notebooks often lists the information which tells the collections worker what the marks mean. The labels and notes that go with a specimen are almost as important as the specimen itself. In fact, without accurate documentation a fossil is nearly worthless as a scientific specimen. The labels give not only information about who collected it, where and when, but they also provide a musuem history of the fossil from the time it was collected to the present, including what buildings, cabinets, and drawers it has been stored in, and who has borrowed, studied, and identified it. Any or all of this information may be of value when trying to track down missing specimens, unnumbered specimens, or other curatorial problems.

Once the labels from an individual tray are cleaned and the Inventory Label is checked for completeness, place all the documents in the smallest dimension bag that will hold them (see The Goldilocks Rule) without folding any of the documents. The bag should be large enough so the documents can be removed again without damaging them. The following instructions are only suggestions. The important thing is to be consistent in the way you place documents in the bag. You will find this out when you have to open them all up again or try to read them to enter information on the database. It will take you much less time if you can pick the bag up the same way each time and see the information displayed in the same way.

> If more than one label belongs with the specimen, place the second document behind the first so it is readable through the opposite side of the bag. Flip the bag over and insert the document so that the left hand edge of the second document is at the same end of the bag as the left hand edge of the first document. This allows for easiest reading of both documents, with minimum effort (merely flip the bag over, top-to-bottom), and minimizes the necessity of future workers opening the bag and handling the documents. If more than two documents accompany the specimen, place the documents in the best arrangement that will accomplish the above minimization.

Double check that the Inventory Label has the same specimen number and prefix as that printed on the specimen.

Place the bag with all documents from the specimen tray into the transfer container (preferably a large zipper bag, to keep the smaller bags together). When the day's specimens are cleaned, this transfer container bag will be taken to the main collections office (as of 19 July 1999, PRC building 122), where the documents will be scanned into a database. Include a piece of paper in the bag, with your initials and name, and the date you cleaned the specimens. I suggest using colored paper, at least 3"x3" or larger. This will make the paper stand out and be easier for the next person to handle the documents to find the Conservator and Conservation Date information.

Carefully remove each specimen from the tray. If the specimen is robust, and will not lose bits of supporting matrix or portions of the specimen itself, gently clean the surface using the hypervac with attachments. The object of this step is to remove all loose dust that has settled on the surface and within the ornamentation and crevices of the specimen over the years, not to remove bits of the specimen or do detailed preparatory work.

If the vacuum does not seem warranted, due either to the small size of the specimen, or the softness of the specimen or matrix, use a soft bristle brush and gently brush the entire surface of the specimen. Brush the dust onto the cafeteria tray for easiest disposal. This will also allow you to see if any critical bits of the specimen come loose during cleaning. If the specimen begins to come apart as you clean it stop cleaning and procede to the section on Stabilization of Deteriorating Specimens. Save all pieces that break off of the specimen. They can be recovered and glued back onto the specimen, or saved in a labelled vial with the main part of the specimen. Every specimen will produce some material, either dust or dust and broken bits. In some cases the broken bits will be separated from the dust and saved. In other cases everything will be discarded. There is a point at which the sloughed bits of the specimen are not significant enough to save or to worry about. This requires making a judgement based on experience with other specimens, the size of the specimen itself, versus the amount and size of the broken bits, and what portion of the specimen has broken away. Whenever there is ANY question about whether the material should be saved, go with the side of caution and save the material, and then ask the Collections Manager or Supervisor. Any material can be discarded down the line, but once it has been thrown away it can not be recovered. Ask before you do something irreversible.

Select a new tray with a foam liner in which to place the cleaned specimen. Ideally, the tray selected should be the smallest tray that will allow the specimen to rest comfortably in the tray without touching any of the four sides. If there are multiple specimens or pieces, all of the pieces should be able to rest in the tray without touching each other or the sides of the tray. On occasion, the size of the old specimen labels will require a larger tray than necessary for the size of the specimen. In those cases, the bag with the labels should rest in the tray bottom (with foam liner removed) without the documents needing to be folded or in

any way forced into the tray. The excess portion of the plastic bag may be folded to fit the tray, as long as the documents are not crumpled, folded, or potentially damaged.

Place the specimen, in its new tray, in its new location in the collection. See section on Organization of Specimens within the Collection.

After each specimen is cleaned vacuum and wipe the residual dust and dirt from the work area.

- At the end of a cleaning session, vacuum and clean the work surfaces and floor in the work area, then cover the work surface and tools with a layer of plastic to keep off the dust.

Finally, when actually working on the collection, this system will naturally fall apart and go directly to hell. Do not be discouraged! That is why this document gets longer and longer...................

GLOSSARY

Provenance

This means the origin or derivation of an object. In paleontology this means primarily where a fossil was found, vertically within the geological strata, and horizontally as a geographical location. The provenance of a specimen should also include the date of collection and who collected it, and any other pertinent information recorded at the time of discovery.

Archival Quality

All substances that come in contact permanently with the specimens or the specimen documents should ultimately be made of "Archival Quality" materials. "Archival Quality" means materials that have no, or minimal damaging effect on the specimens or their documents. Usually, this requires the materials to be made of metal, a non-reactive plastic, such as poly-urethane zipper-bags or polyethylene Ethafoam®, or a pH neutral product, such as the ink in Pigma® pens or acid-free paper. If you are unsure if a substance is of archival quality, ask the Collections Manager or your Supervisor.

Cabinet

The term "cabinet" as used in the NPL will be used to refer to any box-like structure, either free-standing or built-in to a building or wall, that contains drawers, or shelves, and is used for the purpose of storing fossils or documents. A cabinet may be made of wood or metal. A cabinet may be 10 feet tall, by 10 feet wide, by three feet deep, or 10 inches tall, by 10 inches wide, by 10 inches deep. Most cabinets will have a Cabinet Number attached somewhere on the front of the structure. Different cabinets you may encounter include standard office filing cabinets, wood cabinets that look like a chest-of-drawers, wood cabinets that have locking doors, enclosing shelving or tiers of drawers, metal cabinets with removable, lift-out doors, enclosing tiers of drawers, small wood boxes with a lift up door, enclosing small metal trays. Be prepared for anything.

Drawer

A drawer will be any sliding drawer that is found in a cabinet. Most drawers will be numbered. Most drawers will contain specimens in trays, specimens not in trays, or documents.

Specimen Tray

A Specimen Tray is any flat tray-like object that contains a specimen or specimen label, as found at the time of the current (August 1999) inventory. All Specimen Trays will be standardized in the re-curated portion of the collection. All non-standard trays will either be re-used elsewhere in the NPL, or discarded.

Specimen Catalogue

The specimen catalogues are bound documents created prior to the beginning of the current IMLS project. Each Specimen Catalogue contains itemized information about numbered fossil specimens. There are several different series of Specimen Catalogues, each covering a separate collection of specimens currently in the NPL collections. Most of the Specimen Catalogue series were produced at different times, by different people, or under different systems of curation. Some Specimen Numbers can be found in multiple catalogue series, and can be cross-checked for accuracy or inaccuracy.

Foam Tray Liner and Drawer Liner

Each Specimen Tray, and Drawer that contain specimens will have a foam liner. The foam is archival quality Ethafoam®, or its equivalent. The liner serves several purposes. Primarily it minimizes damage to the fossil by cushioning it from the surface on which the fossil rests. The liner also minimizes shifting of the fossil every time the drawer is opened or closed. Finally, the liners create a visually pleasing and professional looking environment for the specimens individually and for the collection as a whole.

Template

A template is a re-usable pattern, used to create multiple identical copies of an object. For example, the templates for producing foam tray and drawer liners are rigid forms cut from masonite (see MAKING FOAM LINERS FOR TRAYS AND DRAWERS).

Thin Section

A thin section is a very thin slice of rock, mounted on a microscope slide.

Peel

A peel is a thin layer of acetate, applied as a liquid to a cut and prepared (stained) rock surface. When the liquid solidifies it is "peeled" from the rock. A very thin layer of the rock surface adheres to the acetate. This acetate with its thin rock layer is fixed between thin pieces of glass, for study under a microscope.

Latex Mold

The term Latex Mold is used to differentiate between a manufactured mold of a fossil specimen for the purpose of creating a duplicate cast of the fossil and a naturally produced sedimentary structure, such as an internal mold, or an external mold.

In order to create an exact duplicate or reproduction of a fossil, two steps are required. First a mold must be made of the fossil shape. The mold is an inverse shape to the fossil, usually made by pouring a fluid over or into the fossil. The fluid solidifies and is peeled away from the fossil. Where the fossil is convex the mold is concave. Where the fossil is concave the mold is convex, etc. Then the mold is filled or covered with the casting material. The mold is stripped away, and the cast should have the exact form of the original fossil.

Latex (natural rubber) was once about the only material used to make reproduction molds. Now there are many synthetic materials used as replacement for latex. However, it is easiest to continue to refer to the mold itself as a "Latex Mold" whether or not it is actually made of latex. The Latex Mold may be almost any color, since dyes can be added to the molding material.

Plaster Cast

Most cast reproductions of fossils are made of either plaster or resin. The term Plaster Cast is used to differentiate between the manufactured reproduction of a fossil specimen and the naturally occurring sedimentary structure fossil cast. Plaster Casts may be any color. Dyes can be added to plaster and resin before the cast sets and becomes solid. Stains and paints can be added to the surface of the cast after it solidifies. Some Plater Casts look very realistic and can be difficult to distinguish from an actual fossil. In general, most Plaster Casts are lighter in weight than fossils, although this is not always the case. If you suspect a specimen is a Plaster Cast but are not sure, ask the Collections Manager or Supervisor for assistance.

Be on the lookout for locality numbers masquerading as specimen numbers

Many apparent specimen numbers, especially from specimens currently (16 Aug 1999) curated in the Northwest Cage of Building 33 are actually locality numbers, which can have anywhere from one to many individual specimens associated with them. Sometimes the specimens may occupy several drawers, all carrying the same locality number with no individual specimen number. These specimens do not have unique numbers and the association with the proper label may be lost if they are separated for scanning or any other purpose. These specimens and labels must not be separated until the following procedure has been completed.

<u>Northwest Cage specimens with locality number but no specimen number</u>

Add NPL number from the NPL number allocation database. Complete the entries as far as possible placing 'na' in columns where data are not available.

Recent Terrestrial Collection
The Complete Steps

1. Pull drawer from Askew Collection located in the northwest cage of building 33.
2. Cover drawer with plastic wrap or foam before transporting to building 122. Prefer transportation by car.
3. Clear an area on one of the big tables in the main room of 122. This will be your work area.
4. Gather the supplies that you will need: brushes for cleaning, archival pens, tweezers, sharp picks, conservator labels, plastic baggies of various sizes depending on size of specimen labels (these bags are closeable), plastic baggies of various sizes for the specimens (these bags do not close), several different sizes of plastic vials, small white strips of archival paper cut to fit inside the vials, cotton or plastic gloves and a foam surface to work on. You are now ready to begin.
5. Remember, you must **ALWAYS WEAR YOUR GLOVES**. Take a specimen box from the drawer and set it on your foam work surface. Remove the specimen from the box and set it aside. There should be a number written on the specimen. If it is in a vial the number will be on the side or the top (or both) of the vial. This is the specimen number. If you encounter repeating specimen numbers in the same drawer refer to the **RTC** Addendum found at the end of these steps.
6. Grab a conservator label and fill out the date (ex. Nov 6 and then circle the current year, or cross off the other year), the specimen number (including any prefix, i.e. UT, WSA, etc.), the # of pieces found, the container (which will always be a vial because that is what the specimen will end up in), cabinet and drawer (which are found on the drawer you are working from) and conservator (which will be your name, ex. A. Smith). IMPORTANT: There are two places the specimen number is written on the old vial: the vial itself and the cap. Make sure the numbers are identical before you write the number on the conservator label. If the numbers are not the same, someone has made a mistake and you need to ask about it before you proceed. Make sure you always use the archival pen. If you make a mistake on the label tear it in half, throw it away and begin again.
7. Set the conservator label aside and pull any labels found in the specimen box out and set them on the foam work surface. With your brush, gently wipe away any dust that may have accumulated on both the front and the back of the labels. It is important to remember that some of these labels are very old and could easily be damaged with very small amounts of pressure.
8. When the labels have been cleaned you will need to grab a plastic baggie of the correct size to accommodate the labels with out bending or folding of any sort. Place the conservator label in first with the front facing out and with the short red end of the bag to your right. The side with the red stripe should be closest to you. Then flip the bag and carefully place the remaining labels in just as you did with the conservator label. Close the bag. Now you should be able to flip the baggie and always be able to read the label with out turning. Set aside.
9. Grab one of the small pieces of white archival paper and very neatly write the specimen number on it. This will go in the vial with the specimen. Set aside.
10. Remove the specimen from its box or vial and place in front of you on the foam work surface. If the specimen is stuck in the vial try using the tweezers or a sharp pick to dislodge it. Some of the specimens are very small and/or delicate and it is important to not lose, break, or squash them. (If there is no specimen in the box or vial but there are labels and there is a specimen number, proceed as if the specimen existed.) With your brush, gently wipe any loose material that may be found on the outside of the specimen. Look for dirt and dust and remove what you can. You may use the sharp pick to chip off dirt.
11. Once cleaned, place the specimen into a non-closeable plastic baggie. Try to align the specimens so that minimal surface contact is made and once the bag is placed into the vial they will not move. It is suggested that you line the specimens up with the bottom of the bag and roll the bag horizontally so that the specimens end up suspended in the middle when the baggie is placed vertically in the vial.

12. Select a vial that is large enough for the baggie to fit into with out the specimens inside being squashed in any way. Make sure the vial you have selected is not too large, or else it won't fit when the drawer is inserted back in its cabinet. Place your rolled up baggie inside the vial. Once loose the bag should unroll enough to fill the vial and create stability for the specimens. If the bag is too large for the vial, fold the top of the bag down. Grab the piece of archival paper with the specimen number written on it and slide it into the vial between the side of the vial and the plastic bag so that the number is visible and does not slip. Place the plastic lid back on the vial. You may place the finished vials back in the drawer or another temporary storage place until the drawer is finished.
13. Place all baggies containing labels into a larger bag. This keeps all the labels together and makes transporting them easer.
14. When all specimens have been cleaned you will need to remove any left over boxes or materials from the drawer. Clean the drawer over a garbage can and remove all dust and dirt with a brush.
15. Cut a foam drawer liner for the drawer. A template is available. Place foam liner in drawer.
16. Place all cleaned specimens into the drawer in numerical (and if necessary alphabetical, i.e. UT would come before WSA, etc.) order.
17. Check the catalogue inventory database to make sure that there is an entry for each specimen you worked with. If the information has not been entered yet, you must obtain the information from the correct catalogue inventory book and enter it in the catalogue inventory database. When you look in the catalogue inventory database, you are essentially making sure that the old *label* (the one that was originally with the specimen) matches the information in the catalogue inventory *database* and double-checking to see that it matches the information in the catalogue inventory *book*. The information in the catalogue inventory database was obtained from the information in the catalogue inventory book, so make sure that there are no errors in the database when you check the book. The original label's information should coincide with the information on the book and database. (note: when entering information into the database, you should only type the collector's name in the "collector" column, and only the number in the "collector's number" column.) So remember, check the book, the database, and the original label. If the information does not match up and the problem is not apparent, ask someone for help. If you are working with the Singley collection, there is a list of problems and solutions you can refer to so that you can proceed.
18. Grab the bag containing all of the labels and take it to the scanner.
19. Scan labels.
20. Check off in fossil inventory.
21. File labels in cabinets in building 122
Follow procedures for creating primary labels.

Recent Terrestrial Collection
Addendum

1. It is important to pay attention to repeating specimen numbers. Sometimes specimens with the same number are placed into different boxes in the same drawer. If this is the case the specimens will need to be combined. The procedure is as follows: First note which box of specimens have labels or not. If none of the boxes have labels and the specimens are small enough to fit into one vial, create one conservator label and combine the number of specimens. If the specimens are too large to fit into one vial, they will need to be placed into as many vials as necessary. For each vial, a conservator label will need to be made with the same information on each except for # of pieces. Also, on the top right corner of the conservator label you need to place an A, B, C, etc. next to 'Multiple tray' for each vial. A, B, C, etc. will also need to be printed next to the specimen number when you write it on the piece of archival paper that will go into the vial with the specimen. The conservator labels will then be placed into the same bag. If one or all boxes of same-number specimens have separate labels you will need to keep these labels separate as well as the specimens. You will proceed in the usual way by

filling out a conservator label for each box or vial of specimens and placing all labels into separate plastic baggies. Because they are repeating numbers from the same drawer you will need to designate each vial (archival paper label) and conservator label with an A, B, C, etc. When finished you will need to place all of the smaller bags into a larger one to keep the specimen numbers together.

SINGLEY COLLECTION
Problem Descriptions and Solution Procedures

1. If the Singley specimen label that you are working with does not match the information in the catalog inventory, you will need to complete the following steps to search the catalog inventory database to find the specimen that the label does belong to.

2. To find the specimen that the label belongs to, right click the mouse on the Notes column, and then select "Find". This will bring up a window which will allow you to search that column.

3. Switch "Match:" to "Any Part of Field" before completing the search.

4. In the "Find What:" field, type in the Whitney catalog number that appears on the Singley specimen label in order to complete the search. Whitney catalog numbers appear in one particular format, e.g. 5-59-1131.

5. If this search does not come up with the appropriate match, repeat steps 2-4 to search in the Locality number column using the Whitney Catalog number.

6. If this search does not come up with the appropriate match, repeat steps 2-4 to search in the Collector's Number column using the Singley collection number.

7. Once you believe you have found the correct specimen, be sure to verify that the rest of the information on the Singley specimen label matches the information in the catalog for the newly matched specimen.

8. **Make a note on paper for yourself of which specimens have labels that do not belong to that specimen and which specimen that label really belongs to.** This step is very important so that you have a list that tells you where the labels were originally, because you will be moving some of the specimen labels around and will need to make a note in the databases of which specimen label was originally with which specimen.

9. There are several types of problems you will come across:
    1) The Singley specimen label belongs to another specimen in the same drawer.
    2) The Singley specimen label belongs to another specimen in a different drawer.
    3) The Singley specimen label belongs to another specimen but you cannot find what specimen it belongs to.

10. Repeat steps 1-9 for all of the specimens in your drawer whose Singley specimen labels do not match the information in the catalog inventory.

11. In the event of Problem 1, complete the following steps:
   a. Move the Singley specimen label to the proper specimen, matching it up with the proper conservator label.
   b. When you do this, there may be another incorrect label with the newly matched conservator label. This label can then be moved to either 1) the correct specimen if the specimen is in the same drawer, or 2) the specimen from which the original incorrect label came from.
   c. Be sure to move the labels around before writing the corresponding note, and **before scanning the labels**.

12. In the event of Problem 2 or 3, don't move the label! Just make the proper note in the catalog inventory and in the fossil inventory.

13. **Notes**:

How to compose the note:

   a. Write the note in the Notes column of the catalogue inventory database :
   e.g. "Problem: Moved Singley specimen label from _____ (e.g. UT-2778) so that the correct label is now with this specimen."
   b. Highlight "Moved Singley specimen label from _____ (e.g. UT-2778) so that the correct label is now with this specimen."
   c. Hit Ctrl-C to copy this note.
   d. Hit the + sign to the left of the entry in the catalogue inventory database to access the fossil inventory database.
   e. Under the Inventory Problems column, hit Ctrl-V to paste the note.
   f. Hit the – sign to the left of the entry in the catalog inventory database.

There will be five different types of notes depending on which problem you ran across:

Note 1 will be written for a specimen that was matched up with its correct Singley specimen label.
   1) "Problem: Moved Singley specimen label from _____ (e.g. UT-2778) so that the correct label is now with this specimen."

Note 2 will be written for a specimen with Problem 2 that has not had any of its labels switched to or from another specimen.
   2) "Problem: Singley specimen label that belongs to this specimen is not found. The specimen label it has matches the information for _____."

Note 3 will be written for a specimen with Problem 3 that has not had any of its labels switched to or from another specimen.
   3) "Problem: Singley specimen label information does not match with the catalog information for this number."

Note 4 will be written for a specimen with Problem 2 whose Singley specimen label was transferred from another specimen. The reason that this would occur is: A specimen in the drawer has a Singley specimen label that belongs to another specimen in the same drawer. You transfer the Singley specimen label to the correct specimen. That specimen also has an incorrect Singley specimen label with it, but this incorrect Singley specimen label belongs to a specimen in a different drawer. This incorrect Singley specimen label should be moved to another specimen in the drawer that does not have a Singley specimen label (usually the specimen where the original correct label came from).
   4) "Problem: Singley specimen label that belongs to this specimen is not found. The specimen label it has matches the information for _____. This specimen label was originally in the drawer with specimen _____."

Note 5 will be written for a specimen with Problem 3 whose Singley specimen label was transferred from another specimen. The reason that this would occur is: A specimen in the drawer has a Singley specimen label that belongs to another specimen in the same drawer. You transfer the label to the correct specimen. That specimen also has an incorrect Singley specimen label with it, but you do not know of any specimens that this incorrect Singley specimen label belongs to. This incorrect Singley specimen label should be moved to another specimen in the drawer that does not have a Singley specimen n label (usually the specimen where the original correct label came from).

   5) "Problem: Singley specimen label information does not match with the catalog information for this number. This specimen label was originally in the drawer with specimen _____."

Creating Primary Labels

1. Open TAGRsurv in the database and click on "Queries" (found to the left of the screen).
2. Choose the "Catalog-Fossil Data Completion" folder (**C-FDC**)
3. Click **once** so it is highlighted.
4. Click on "Design" in the header bar. This brings up several columns with check marks (√). Scroll to right until you get to "cabinet #"- type in the cabinet # that you are making labels for. Repeat for "drawer #." Drawer # needs to be in quotes: "#".
5. Change both "Specimen Moved" and "Archival Labels" columns to say 'yes'.
6. Under "Final Checker, Fossil Inventory" change 'Is Null' to 'Is Not Null.'
7. Save and close window.
8. At main window, scroll down to the "Final Check Prior to Label Printing" folder (**FCPLP**) and repeat steps 3 thru 4 (be sure to check and see that cabinet and drawer #s match those in the **C-FDC** folder, including quotes around the drawer #).
9. Under "Final Checker, Catalog-Fossil Data" change 'Is Null' to 'Is Not Null.'
10. Save and close window.
11. At the main menu **double** click on the **FCPLP** folder to open it. A summary of the specimens should appear. (**Sometimes steps 6 and 9 do not work. If you do not have success in pulling all of the specimen numbers up at this time, try re-doing steps 6,7 and 9,10 by changing "Is Not Null" back to "Is Null".**) If nothing appears there could be several reasons for this:
      • The specimens have not been entered into the fossil inventory
      • The specimens have not been entered into the catalog inventory
      • The cabinet and/or drawer number has been entered wrong in the fossil inventory (or not in quotes in the **C-FDC** and **FCPLP** folders)
      • The specimens might not have been checked off correctly in the fossil inventory ("specimen moved" and "archival label" should both say yes regardless of weather the specimen was actually moved or not)
      • The Primary Label column, the final check date column , the label printed column and final checker column might already have entries in the fossil inventory
      • See Ann if, after checking all of these possibilities for each specimen number, you still have no success
12. At this time you should check to see if all information is spelled correctly and agrees with the information in the catalog books and on the specimen labels. Look up each specimen number in the catalog to compare it to the information found in the **FCPLP** folder. If there are misspellings, incorrect entries or incomplete entries change the information to match the catalog (see Ann if there are major differences between the label and the catalog entry). Also, it is very important that you make sure all of the specimen numbers from the drawer you're working on show up in this list. Sometimes a random number, not found in your drawer, will replace a number that is found in your drawer. Once completed **save** the information and close the window. At this time check to make sure the same information shows up in the **C-FDC** folder. Close the file when finished.

13. At main menu choose "Reports" (found to the left of the screen).
14. Choose "Labels from ? Final Check before printing 2" and **double** click to open folder. A preview of labels for the specific drawer/cabinet will appear.
15. Place archival paper in the Deskjet printer (starfish) and print the labels.
16. Before you proceed any further, you will need to return to the fossil inventory and enter the final check and label printed dates (often the same day) as well as final checker (your name: first initial. last name, unless somebody else did it beforehand) and indicate the primary label was printed by choosing 'yes.'
17. After printing the labels you will need to cut the labels out of the paper, cut plastic holders to fit the shape of the labels and fold the labels so that they are not higher than the top of the drawer. Put them in order and match them with their specimen counterpart in the drawers. The order of the specimens is a follows: Smallest specimen numbers start in the top left corner and continue down with each row moving to the right.
18. If you have questions see Ann.

Procedures for Scanning Labels

*Before you start, please keep in mind that it is very important that you do not mix up the labels. Because some of the original labels do not have numbers or taxonomic information on them, it would be very difficult to match them with their conservator label once mixed up. Only do a few at a time if needed.
**Also, make sure you have as few other programs running as possible. The more running on your computer at the same time the more likely the scanner will get stuck or run very slowly.

1. Take the conservator label and partner original labels out of the plastic baggie and line them up in a column on the scanner. Start in the top left corner with the conservator label on top. Make it a habit to always have the conservator label on the top of each set of labels. This helps you distinguish between the end of one set and the beginning of another. The columns move down and to the right and you may only end up with one or two columns, depending on the size of the labels. Be sure to leave enough room on the sides and the top of the scanning surface so that parts of labels are not cut off when scanned.

2. Open **Adobe Photoshop**. Once open, click on **File**, go to **Import**, and click on **TWAIN_32…** This will open the scanner. (You may also access the scanner by clicking on the **Scanner** folder on your desktop and choosing **HP Precision Scan**. Once open make sure **Adobe Photoshop 5.0.2** is selected in the **Scan To** box.)
3. When the scanner opens a small screen will appear. Double check to make sure the box **scan in color** is checked off.
4. Click the **Scan** button.
5. Wait a few moments for the scanner. A new window will open with your scanned image.
6. Select the icon to the left with the dashed box on it.
7. Draw a box around the scanned area. The scanner will then do one of two things: 1) the scanner will ask you what type of picture you scanned (i.e. color photograph, black and white photograph, drawing, etc. [this is known as the **region type**]). You choose by selecting the type of picture and then clicking on **OK**. Or 2) the scanner will automatically decide what type of picture it is and choose the region type for you, foregoing the extra time of choosing yourself. Although the scanner usually chooses correctly, you may want to change the region type for whatever reason, or double check to make sure the scanner was correct. To do this click on **Settings** at the top of the page and click on **Region Type**. This will give you the option to change the region type if needed. **ALL LABELS MUST BE SCANNED AS COLOR PHOTOGRAPHS.**
8. After choosing the region type, click **Accept**. (Be prepared to wait at this time. The scanner is transferring information to Photoshop and this can often take several minutes. If after 5 minutes nothing happens the computer might be stuck. The best way to handle this situation is to wait it

out. The computer is pretty good about un-sticking itself after a time or telling you what the problem is and how to fix it. Try not to run any other programs while waiting. Busy yourself with another task such as cutting foam if the wait gets too long. Feel free to ask Ann for help.)

9. Once in Photoshop, in the tools column, select the **Rectangular Marquee** tool. (This will be a dashed box located in the top left corner. If you do not see a dashed box go to the top left corner of the tools column and click and hold down on that box until an icon menu appears to the side. Select the dashed box.)
10. With this tool, draw a box around a single group of labels (for example, a conservator label and its partner labels)
11. Copy the image by pressing **Ctrl** + **C**
12. Then press **Ctrl** + **N**. This brings up a **New** image window. The sizing is automatic so click OK.
13. To paste the image you copied onto the new box, press **Ctrl** + **V**
14. In the toolbar menu select **Layer** and then **Flatten**.
15. To save, press **Ctrl** + **shift** + **S**. The image will be saved in **My network places → databases on squid → NPL → images of labels**. Depending on the collection you are working on, you need to save it to the appropriate file. If you are working on the UT collection, for example, select the folder that says 'Only UT.' The images are named according to collection type and their number. When saving, always put the prefix of letters (capitalized) before you put the number. Also, the names always have six digits in them. Your number may not have six digits, so put zeros in front of your number to make six digits. For example, if your specimen is UT1234, save the image as 'UT001234.' Make sure that there are no other images that are saved as this file name, because there is a special procedure that you must follow for these images (see PSL Addendum). Make sure the image you are about to save is a **'.jpg'** file. If the computer wants to save as a **'.psd'** file and gives you no other options then you need to cancel out of the **Save as** box and make sure you flatten the image again.
16. Click **OK** to save the image. Choose a high quality setting (6-10) when prompted for **Image Options**.
17. Close the just saved image.
18. Delete the selected group from the original scanned page so you won't accidentally try to save it again. Simply press '**Ctrl** + **X**' to cut the image from the page. You are now left with many more labels to select and save so repeat steps 9-17 for each label group. (When retrieving the scanned labels from the scanner make sure you 1) open the lid very slowly so the labels don't scatter everywhere and 2) keep the scanned labels separate from the un-scanned labels to alleviate confusion.)

Procedures for Scanning Labels
Addendum

You scanned, copied, pasted and flattened a set of labels. When you tried to save the labels the number was already listed in the file. What do you do? You **DO NOT** replace the original file with the one you're saving. Instead cancel out of the **Save As** box and proceed as follows:

1. Click on **File** and choose **Open**
2. Find the folder with which you are working (**My network places → databases on squid → NPL → images of labels**)
3. In that folder find the number that you were trying to save
4. Double click on that number to open the image
5. Compare the named image to the one you were working on (same number but unsaved, untitled). If they are the exact same image (meaning you accidentally scanned the image twice) then close both images. Your job is already done. If they are not the same image then

continue. (Make sure that they both have the same collection name and number on each conservator label.)

6. Click on the named image once so it is selected. You need to make space in this image because your going to copy the untitled image into this one.
7. Click on **Image** and **Canvas Size**
8. You can resize the image any way you want. Double the width and height settings to try and make enough room for the new labels. Use your best judgment on size. The box at the bottom allows you to designate a specific area for all of the new extra space. If you do not alter the box, Photoshop will automatically divide the space equally around the perimeter of the image. When finished click **OK**.
9. You might need to move the labels around after adding the extra space. Select the **Move Tool** from the toolbar (located in upper right corner). Use this tool to move the labels to one part of the image to make room for the next set.
10. In the untitled image, you can draw a box around the images to be copied or press **Ctrl+A** to select the entire image for you.
11. Copy the image (**Ctrl+C**)
12. Click on the named image so it is selected and press **Ctrl+V** to paste the new image of labels
13. Use the **move tool** again to position the new set of labels on the image. (Please note that Photoshop works in layers [**Show Layers** can be found in the **Window** menu]. You now have two layers on the named image. You may only move one layer at a time. Click on each layer to move that layer.)
14. Once your labels are positioned next to each other (nothing should be covered up or cut off) you need to designate its **Multiple Tray** letter.
15. Click on the **Type Tool** in the Toolbar (designated by a capital letter T)
16. Click on the image near the top of the conservator label of the first set of labels in the Multiple Tray area.
17. Type an **A** (make sure your using a dark color such as black and the text is large enough to read). If your working with a set of labels that already have been given a multiple tray letter then continue with the following letter. After Z start with AA, BB, CC, etc.
18. Click **OK**
19. Now Type a **B** on the conservator label of the next set of labels.
20. Click **OK** (Remember, the text also works as layers so now you have 4 layers on your image. Select each layer to move that layer.)
21. While you are doing this write down which set of labels you designated as A and B. Good ways to distinguish might be by date, drawer and cabinet number or by conservator. Set aside.
22. Once you have positioned your image you need to flatten it. Click on **Layer** and then **Flatten Image** to do so.
23. Press **Ctrl+S** to save the image. Since the image is already named you do not need to rename it.
24. Close the image.
25. When you take the labels off the scanner find the number that you wrote down. Write the multiple tray letter on the conservator label with an archival pen. Make sure you write the correct letter on the correct conservator label (the dates, cabinet, drawer and conservator match up).
26. Find the other set of labels. You will probably have to find the labels in the cabinets in the back of the office. Ask Ann where to look. Once you find the labels write down the letter for the multiple tray. Re-file the labels.
27. Ideally, at this time you need to find the actual specimens in their containers and add a piece of archival paper with their multiple tray letter on it to their container. This is not always as easy as it sounds but try to find at least one specimen and add the multiple tray letter to it.

Young Collection
The Steps

1. In the SW cage, Pick the box of rocks you need to work out of; i.e. Cabinet/Drawer # on side of box
2. Determine which layer of rocks goes with which drawer.
   Example: box 7-5 ↔ 7-9 has layer 7-5 on the bottom and layer 7-9 on the top. Remember this! If you still have questions see Fabienne.
3. Be sure to label each layer of rock in the box with the appropriate cabinet and drawer #s because they will have changed. The cabinet #s will be 400 (completed), 401 (1/2 completed) and 402 (not started). Drawer #s will start at top right drawer (#1) and continue down the column and begin again at the next column to the left. For example: Cabinet 401

9	5	1
10	6	2
11	7	3
12	8	4

4. Clean the specimens and make a conservation label for each.

Be sure to put multiple *drawer together!* different drawers have labels.

> **CONSERVATOR LABEL**
> **Multiple tray:**
>
> **Location Prior to 2001/2002**
> **Specimen:**   **# of pieces:**
>   **Cabinet:**
>
> **County:**   **# of specimens:**
>   **Drawer:**
>
> **Formation:**   **Container:**
>   **Conservator:**

specimens *from the same* Multiple specimens from different conservation

inventory! Chris S. of the Young into the database, but the #s still need

5. Update the fossil has already put all Collection fossils cabinet and drawer to be changed. Other things that need to be updated and changed include conservators name (found on the Conservator label), *building* and *new building* columns (should have PRC 33 entered in both) and the *specimen moved* column (should say YES).
6. Put the conserved specimen in the appropriate drawer, label the drawer with a "sticky" and bring all labels back to PRC 122.
7. Scan labels and save in Photoshop under the usual folders (UT/WSA/etc.).
   If you have a conservator label with no specimen # listed, scan and save it in the "Young Problems" folder.
8. After scanning the problem label, place it in the bag labeled Young Problems located in the second tray (Archival labels **TO BE CHECKED** on fossil inventory) next to the scanner.
9. In the fossil inventory be sure to change the *Archival Labels* column from NO to YES.
10. Catalog all fossils by adding the specimen into the "Catalog Inventory" folder on the computer. Look up the specimen # in the catalog books and enter the information listed for that specimen on to the computer. Be sure to check off the specimen number with a pencil in the catalog when done.

11. Check all of the labels you have been working on for possible multiple specimens already entered in the fossil inventory.
    a. In fossil inventory sort by the *Collection, Specimen #, Suffix,* and *Multiple Tray* columns in ascending order.
    b. Repeating specimens (multiple trays) from earlier drawers of the Young Collection will always be given the A suffix in the catalog inventory on the computer. For example: Specimen XYZ from cabinet 400/3 is entered in the "Catalog inventory" on Tuesday. Another XYZ specimen from cabinet 401/2 is entered on Wednesday. In the catalog inventory on the computer the specimen from cabinet 400/3 will be given an A suffix because it was entered first (Tuesday). The specimen in cabinet 401/2 will be given a B suffix because it was entered next, and so forth using all letters in alphabetical order.
    c. Many of the Young specimens share #s with thin section specimens (some of which have already been entered into the computer). The Young collection specimens will always be considered first before the thin section specimens and be given the appropriate suffix letter with the thin section suffix being the last letter used. For example: If you have 3 Young collection specimens and a thin section that has already been entered into the computer you would give the Young collection specimens the suffixes A-C and the thin section would have a suffix of D. (Ann will revise this step at a later date.)
12. After deciding which specimen will have which suffix write that letter on the conservator label where it says multiple tray. In Photoshop you will need to add letter onto the saved label.
13. When finished place the labels in the third tray (Archival labels **TO BE FILED)** next to the scanner. The labels then need to be put in order and filed according to their collection (UT/WSA/etc.).