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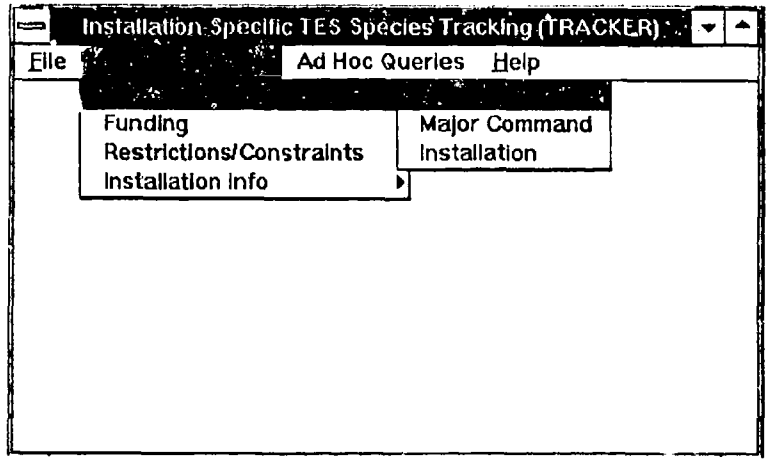
Installation-Specific Tracking Information (TRACKER) Tool

Version 1.0 User's Manual

by
Georgia Sebesta and Alison Hill



The Installation-Specific Tracking Information (TRACKER) program helps installation and headquarters personnel access annual information pertaining to threatened, endangered, and sensitive (TES) species that reside on Army lands. The TRACKER tool is a front end, graphical user interface that accesses the TES species database, and consists of two distinct, standalone components, or executable files. One component, the query and summary tool, retrieves and summarizes information on species occurrence, funding, mission constraints, acreage restrictions, and general installation information. The second component, automated input forms, facilitates the entry of information into a temporary database, to be used by the query tool for data summaries.

TRACKER 1.0 requires a 386 IBM-compatible, 33 MHZ personal computer, with a minimum of 8 MB of random access memory (RAM), VGA capabilities, and 15 MB of hard drive space. The system must be equipped with MS-DOS 3.0 or above, and Windows 3.1 or above.

This manual contains instructions for installation and use of the system and conducting search/retrieval queries for analysis and reporting.

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13. ABSTRACT (Maximum 200 words)

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Foreword

This study was conducted for the Office of the Directorate of Environmental Programs (ODEP), Assistant Chief of Staff for Installation Management (ACS(IM)) under Funding Acquisition Document (FAD) No. 95-080002 dated 3 October 1994, "Environmental Quality Technology"; Work Unit UA5, "TES System and Applications." The technical monitor was Phillip Pierce, DAIM-ED-R.

The work was performed by the Natural Resource Assessment and Management Division (LL-N) of the Land Management Laboratory (LL), U.S. Army Construction Engineering Research Laboratories (USACERL), the Forestry Department at Colorado State University, and the Natural Resources and Environmental Sciences Department at the University of Illinois. The USACERL principal investigator was Dr. Alison Hill. Special acknowledgment is due Alan Anderson, Rachel Shaw, Jan Hari, and Shelia Mochel for technical contributions. Dr. David J. Tazik is Acting Chief, CECER-LL-N and Dr. William D. Severinghaus is Operations Chief, CECER-LL. The USACERL technical editor was Linda L. Wheatley, Technical Resources.

COL James T. Scott is Commander and Dr. Michael J. O'Connor is Director of USACERL.

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1 Introduction

Background

According to Boice and Kaiser (March 1996), over 400 distinct candidate and listed plant and animal species are known to occur on approximately 12 million acres of military land managed by the Army. Army-wide information on threatened, endangered, and sensitive (TES) species is generally scarce though and, when available, is not in a centralized location. Summarized trend information on various topics (e.g., species occurrence, funding, mission constraints, and restricted areas) is also not readily available. This information is, however, critical for establishing necessary baseline data on the status of TES species. Consequently, the U.S. Army Construction Engineering Research Laboratories (USACERL), in developing capabilities to enhance the military's ability to meet requirements of the Endangered Species Act (ESA), developed the TRACKER tool as a component of the TES Species Automated Information Management System (TESSAIMS) (Sebesta 1995). The TRACKER tool is designed to provide the military with an easy access tool, which will retrieve, summarize, and facilitate data entry of annual information on installations and their associated TES species.

The TRACKER tool is a front end, graphical user interface (GUI) that accesses the TES species database and is comprised of two distinct, standalone components, or executable files. Through the query component, the user can pull together and summarize installation-specific information concerning species occurrence, funding, acreage restrictions, mission constraints, and general installation facts. Automated input forms, the second component, provide an easy mechanism for data entry that ties directly into the database.

These components are designed to alleviate many existing problems and concerns. First, the mechanisms in place for various levels to retrieve information is slow and time consuming. The query component will allow data requests to be run in-house, therefore eliminating the middle step of going to an external source. Second, no easy to use or available automated data entry forms are available for TES species information, making the data archival process cumbersome and slow. The automated input forms component will eliminate the need for lengthy paper surveys as a means to gather current information and make the data archival process much

faster. Lastly, a good mechanism for the accountability of TES species on Army lands does not exist with regards to the ESA. A centralized database will solve this problem by providing a storage mechanism for annual information.

The TRACKER tool was designed for military use, from installation to headquarter level, and will benefit a variety of Army users. Installation personnel can use the automated input forms component to provide information directly into a database format. This information can then be used to summarize TES species data from their own installation and to other installations. With these summaries, communication among installations will likely increase. Headquarters and major Army commands (MACOMS) also benefit from data summaries through broad-scale trends. Information from available topic areas will also provide a good baseline for outyear planning and decisionmaking processes.

Objectives

The TRACKER tool is intended to assist the military by providing a reference tool for baseline information on installations and their associated TES species. Specific objectives of the program are to:

- develop a centralized Army-wide database containing and archiving pertinent installation information with regards to TES species
- develop a query tool to retrieve and summarize this information
- develop an automated data entry application
- facilitate the maintenance of current TES species information for accountability with regards to the ESA
- store information on the impact of TES species on military readiness.

TES Species Automated Information Management System (TESSAIMS)

USACERL has been working on the TES Species Automated Information Management System (TESSAIMS) (Appendix A) to help the Army answer TES species information needs. The three distinct components of TESSAIMS:

1. Biodiversity and TES Species Experts (BioTES) (Sebesta and Hill 1996a)
2. Species-Specific Biological Information (SSBI) (Sebesta and Hill 1996b)
3. TRACKER

provide a variety of resources and capabilities to the military user community. BioTES is a searching mechanism that provides information on experts, individuals and organizations in the areas of biodiversity and TES species. SSBI is an interface for species-specific biological information on TES species. TRACKER is a front-end GUI that accesses the TES species database. The entire system, comprised of all three programs, will provide good baseline information for all levels within the military.

Approach

The approach for TRACKER included five basic stages:

1. Determine the basic knowledge available from the installations with regards to TES species.
2. Find and compile the information.
3. Assemble the TES species database.
4. Develop an access tool for the database.
5. Internal and external testing.

To determine and compile information available from the installations, a broad topic survey was distributed to several Army organizations, including the environmental offices, military trainers, and the Judge Advocate General (JAG) office. Responses were then compiled and entered into a centralized database. Concurrently, decisions on application development (e.g., platforms, development tools, database engines, etc.) were also being discussed and made.

Application development consisted of three steps. First, the functionality and capabilities of the application were modeled on paper. The model included the Window's elements (e.g., windows, dialog boxes, buttons, etc.), application flow, and information flow. Review meetings held throughout the development process served to test functions of the application, offered additional features, and checked for consistencies with the other TESSAIMS components. The final step of the application development process was to finish the prototype.

After the initial GUI development stages were complete, internal testing was performed to validate both the information and the application. Internal testing comprised five stages:

1. Choose a group of knowledgeable experts in the area of natural resources and application development.

2. Distribute the application.
3. Obtain general responses.
4. Analyze response comments.
5. Modify both the database and application as necessary.

The TRACKER tool has completed all internal testing and is now ready to be tested externally by the user.

Scope

An understanding of the scope of the TES species database and TRACKER tool is essential. In the summer of 1992, a survey was sent to over 170 Army installations, covering a broad spectrum of topic areas. From survey responses, over 750 TES and other related species were entered into the TES species database. The five most common topic areas (species occurrence, funding, mission constraints, restricted acreage, and general installation information) were included in the TRACKER component. However, during the validation and verification process, some records were deleted. Therefore, not all topic areas have the same subset of installations.

In this first version, TRACKER 1.0, information from the Automated Input Forms component is entered into a temporary database. However, the user is not allowed to make automatic updates to the TES species database. Therefore, the temporary database must be sent to a support center (e.g., the Army Environmental Center) where it can be entered into the centralized TES species database.

Mode of Technology Transfer

Additional copies of TRACKER software can be obtained from USACERL. For technical support when using the TRACKER tool, or for further information about the program, contact Dr. Alison Hill, USACERL at (217) 398-5218 or 1-800-USA-CERL, or write to USACERL, Attn: Alison Hill/LL-N, P.O. Box 9005, Champaign, IL 61826-9005.

2 Using the Manual

Organization and Assumptions of the Manual

The next five chapters provide the system description, instructions on installation and use of the TRACKER tool, and application requirements. Chapter 3 provides instructions for PC system configuration, software requirements, and the installation process. Chapter 4 deals with the general background of the TRACKER tool. Chapters 5 and 6 explain how the Query and Summary component and the Automated Input Forms component work, respectively. Chapter 7 describes related tables, specific data elements, and the data collection process within the database. Chapter 8 documents initial application development decisions for further understanding of how the TESSAIMS works.

The TRACKER tool user's manual is written with the assumption that the user has a basic understanding of Microsoft Windows 3.1 and MS-DOS 3.0 or above. If further information is needed on using Windows or DOS, refer to the appropriate user's manual.

Document Syntax

Instructions, cross-references, and syntax of this manual will help the user navigate through the TRACKER applications. Some instructions are repeated within the various sections, and cross-referenced, so individual topics can be presented in their entirety. The following syntax items will be used throughout this manual:

<Text>	Text written between carats < > refers to various actions including menu selections, button controls, and key strokes.
TEXT	Text written in all capital letters refers to file names, directories, or database elements, including table names, fields, and column names.
Italic	Text in italic refers to tables or data elements that are not currently populated.

A few terms in this manual are used repeatedly that refer to the same concept. These terms include:

Synonyms	Definition
Prototype, Application, Program, Front-End	Prototyped application
Exit, Close, Cancel	Leave dialog box, window, or program without any further actions
Data, Information	Specific information from the database

3 Installing the Program

System Requirements

To use the TRACKER tool you will need:

- Any IBM-compatible machine with a 386 processor or higher
- 8 MB RAM
- Hard disk with 15 MB free disk space
- Windows 3.1 running in enhanced mode
- MS-DOS 3.0 or above
- VGA graphics adapter and monitor
- A mouse

Software Requirements

The TRACKER tool requires two commercially available software packages to run. Recommended software for using TRACKER is the SQLBase database engine (Version 5.1.2) by Gupta Technologies, Inc., and the ODBC Driver Pack (Version 1.0) by Q+E Software/Intersolv Inc. The ODBC Driver Pack is not the only available source for drivers; however, it works well and is the only one tested so far. These commercial applications support the TES species database and links from the application to the database. For installing these commercial packages, refer to the appropriate user's manual. However, for proper setup, the SQLBase database engine must be installed first and then the ODBC Driver Pack. When installing the ODBC Driver Pack, select the drivers for SQLBase.

Installation Process

The program is distributed on 3.5 in. diskettes. To install these files, Windows 3.1 must be running on the computer. Before installing TRACKER 1.0, you may want to create a backup copy of the installation disks, as an added precaution in case of accidental data loss.

1. Start Windows if you have not already done so.
2. Insert the Install 1 disk into drive A (or drive B).
3. Select <Run> from the <File> menu in the Windows Program Manager.
4. Type a:\instalit (or b:\instalit), then choose OK (Figure 1).

A dialog box will then prompt for the desired directory in which the installation files should be stored. The INSTALIT program will automatically install all front end program files and database files to a default setting or an alternate directory may be chosen.

Six installation directories will be created and/or used, if necessary: \TRACK, \INPUT, \SQLBASE\TES, \SQLBASE\TESDATA, \WINDOWS, and \WINDOWS\SYSTEM. The \TRACK and \INPUT directories contain necessary application files. The \SQLBASE\TES directory contains the centralized database, and the \SQLBASE\TESDATA directory contains the data entry database. Necessary libraries and links to the database and programs that run under Windows can be found in the \WINDOWS and \WINDOWS\SYSTEM directories. INSTALIT will only add necessary files and will not overwrite current directories. If duplicate files are found, a dialog box will appear asking you to confirm replacing the file. However, in most cases, it is not advisable to replace current files. These steps complete the installation program.

If the C:\ Drive was not chosen, two files will have to be modified once the installation program is complete. First, in the path statement of the AUTOEXEC.BAT or BOOTPATH.BAT file, the user will need to add the directory chosen for the program (e.g., D:\TRACK or D:\INPUT), and verify that Windows is in the path. Secondly, the user will need to modify the ODBC.INI file (see Table 1), located in the WINDOWS directory. The path for the WINDOWS drivers may also need to be modified (e.g., from C:\WINDOWS\SYSTEM\QFGUP03.dll to D:\WINDOWS\SYSTEM\QEGUP03.dll).

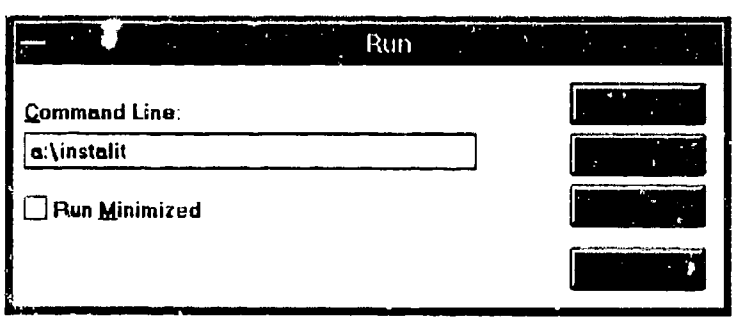


Figure 1. Using the Program Manager's RUN to Install TRACKER.

Creating a Windows Icon

Table 1. ODBC.INI example file and necessary lines for TRACKER.

```
[ODBC Data Sources]
QEGUP=Q+E SQLBase

[QEGUP]
Driver=C:\WINDOWS\SYSTEM\QEGUP03.dll
Description=
Database=TES
ServerName=LOCAL
Servers=
LogonID=
QEWSD=34574
yieldproc=1

[QEGU1]
Driver=C:\WINDOWS\SYSTEM\QEGUP03.dll
Description=
Database=TESDATA
ServerName=LOCAL
Servers=
LogonID=
QEWSD=34574
yieldproc=1
```

The installation process does not automatically create an icon for each application. Therefore, two icons will have to be created for the TRACKER tool, one for the Query and Summary component and another for the Automated Input Forms component. To create a Windows icon, first select or create a program manager group for the icon to reside in. To create a new program group, select <New> from the Program Manager menu, under <File>. In the dialog box that appears, click on "Program Group" and then the <OK> button. Next, the Program Group Properties dialog box will open. The only information necessary to create a new program group is the Description, which can be any meaningful title the user desires. Once a title has been entered, click on the <OK> button. The new program group window should appear. To create the application icon, select <New> from the Program Manager menu, under <File>. In the dialog box that appears, click on "Program Item" and then the <OK> button. A dialog box will then prompt for two pieces of information about the application the icon represents. The Description is the descriptive title of the application (e.g., Query and Summary component or Automated Input Forms component). The Command Line is the location of the executable file (e.g., C:\T-Q&S\TRACK.EXE or C:\INPUT\INPUT.EXE). Once this information has been entered, click on the <OK> button, and the icon will appear in the selected program group. For more information on this topic, refer to the Windows user's manual.

TESSAIMS Applications Installation Overlap

For users who install more than one component of TESSAIMS, the ODBC.INI file (Table 2) will contain additional lines that differ with each application. Instructions for modifying this file are similar to those mentioned above for the TRACKER installation process. However, the appropriate path must be designated in this file

for the individual components to work properly. To ensure that the ODBC.INI file is entered correctly, the user's manual for each component of TESSAIMS contains the appropriate lines for the ODBC.INI file according to each application.

Table 2. ODBC.INI example file and necessary lines for TESSAIMS.

```
[ODBC Data Sources]
QEDBF=Q+E dBASEFile (*.dbf)
QEGUP=Q+E SQLBase

[QEDBF]
Driver=C:\WINDOWS\SYSTEM\simba.dll
FileType=dBase4
DataDirectory=c:\dbase2
SingleUser=True

[QEGUP]
Driver=C:\WINDOWS\SYSTEM\QEGUP03.dll
Description=
Database=TES
ServerName=LOCAL
Servers=
LogonID=
QEWSD=34574
yieldproc=1

[QEGU1]
Driver=C:\WINDOWS\SYSTEM\QEGUP03.dll
Description=
Database=TESDATA
ServerName=LOCAL
Servers=
LogonID=
QEWSD=34574
yieldproc=1
```

4 Tracker Application

The TRACKER tool is designed to access installation-specific TES species information from a centralized database. In this case, access means both retrieving and entering information. Accessing mechanisms for TRACKER are comprised of two distinct applications, the Query and Summary component and the Automated Input Forms component. The Query and Summary component provides an easy access mechanism to retrieve and summarize information from the database. The Automated Input Forms component provides a mechanism to easily enter the necessary information for the other component. Chapters 5 and 6 explain these components in more detail.

Starting the Applications

To start either application, double click on the appropriate TES species icon. If icons are not available, read the instructions for **Creating a Windows Icon** in Chapter 3. When selected, each application will begin with an introductory dialog box—Figure 2 for the Query and Summary component or Figure 3 for the Automated Input Forms component. The dialog box states the application title, release version and date, funding source, and development information. Proceed by clicking on the <OK> button or <Cancel> button (respectively), located in the lower righthand corner.

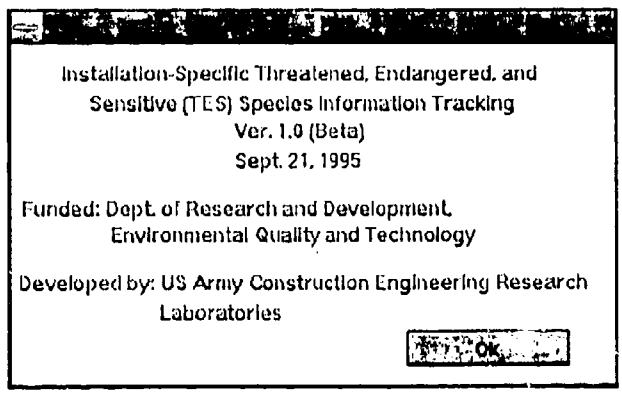


Figure 2. Introduction Dialog Box for TRACKER's Query and Summary component.

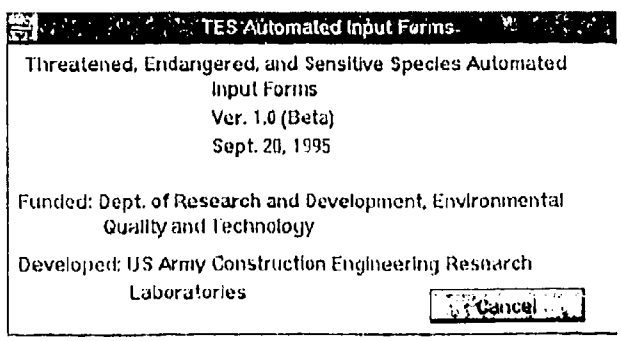


Figure 3. Introduction Dialog Box for TRACKER's Automated Input Forms.

5 Using the Query and Summary Component

This chapter explains how the Query and Summary component works according to the main menu. The main menu options at the top of the TRACKER Program Manager window (Figures 4 and B1) are visible when the program starts. Main menu options include: <File>, <Canned Queries>, <Ad Hoc Queries>, and <Help>. The following sections describe each menu selection, with two query mechanisms, <Canned Queries> and <Ad Hoc Queries>, comprising most of the discussion. The <Canned Queries> menu encompasses the most frequently requested installation and TES species summaries from each topic area (species occurrence, funding, restricted acreage, mission constraints, and installation information). The <Ad Hoc Queries> menu assists the user in developing specialized queries on species occurrence information. The menu flow for topic areas within each query mechanism is diagrammed in Appendix B.

File Menu - Exiting the Program

The <Exit> command (Figure 4) under <File> closes and ends the program.

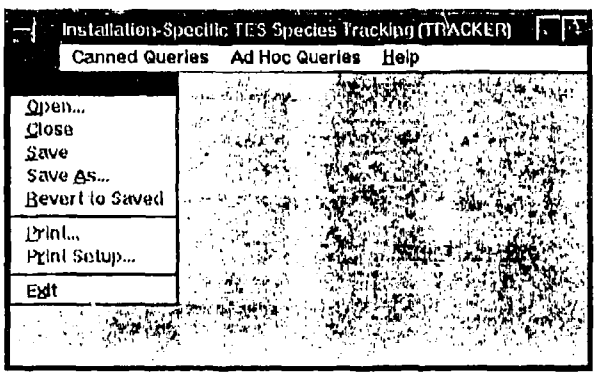


Figure 4. <Exit> Menu selection.

Canned Queries

The <Canned Queries> mechanism (Figure 5) is used to summarize the most frequently requested information from the database. Topic areas covered by the Canned Query mechanism include: species occurrence, funding, restricted acres/mission constraints, and general installation information. Each topic area has a unique query dialog box that summarizes a variety of information (Appendix C).

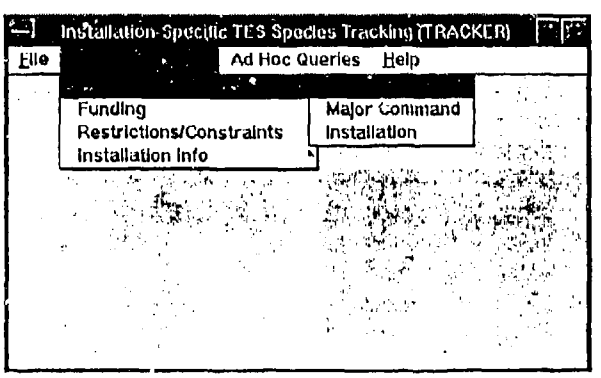


Figure 5. <Species Occurrence> Menu.

Parameters for these summaries are selected by the user to obtain output information and help narrow the scope of the data request. One of the initial parameters chosen is that of the organizational level of interest (Service, Major Command, or Installation) (Figure 5). While reading through each query mechanism, the user may want to review the associated flow diagrams in Appendix B and the summarized table in Appendix C to understand the relationship between the input and output summaries.

Dialog boxes for <Species Occurrence>, <Funding>, and <Restrictions/Constraints> menus have three similar list boxes (Selection within Level, Federal Status, and Year). Depending on the organizational level chosen, the Selection within Level list box will list all appropriate Services, Major Commands, or Installations from the database (e.g., Army, Air Force, etc.) (Figure 6). The Federal Status list box limits the information to species with a particular Federal status (Candidate, Threatened, Endangered, Threatened and Endangered, or All Listed Species) that the user chooses. The Year list box refers to a particular year date stamp for data in the database. In addition to these list boxes, each dialog box has a common edit box that stores the menu selection organizational level chosen at the start of the Canned Query mechanism. The following sections describe how to access this information and the unique features for each of the Canned Query topic areas: <Species Occurrence>, <Funding>, <Restrictions/Constraints>, and <Installation Info>.

Species Occurrence

Description of output information. The Species Occurrence Canned Queries option (Figure 5) provides access to information that answers five basic questions on TES species occurrence (Appendix C) from three groups of information summaries: General List group box, Hot List group box, and the <Category Groups> button. The General List group box (Figure 6) provides a summary of the number of distinct TES species on individual installations (<Count>),

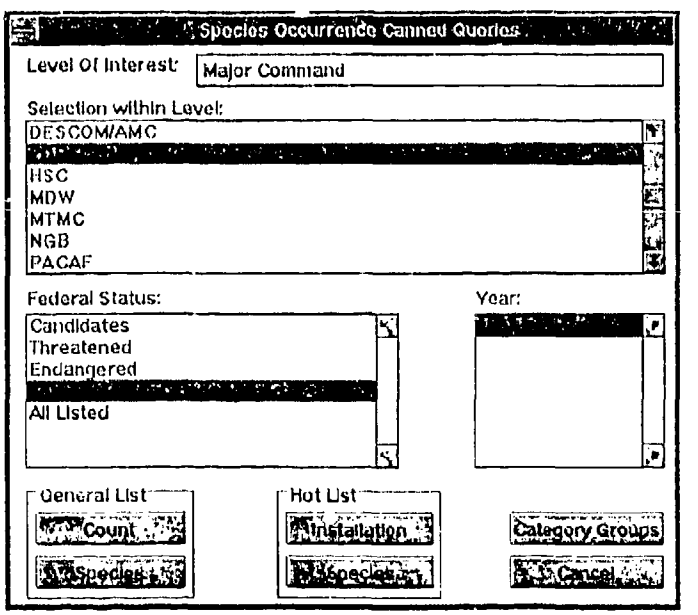


Figure 6. Species Occurrence Canned Queries Dialog Box.

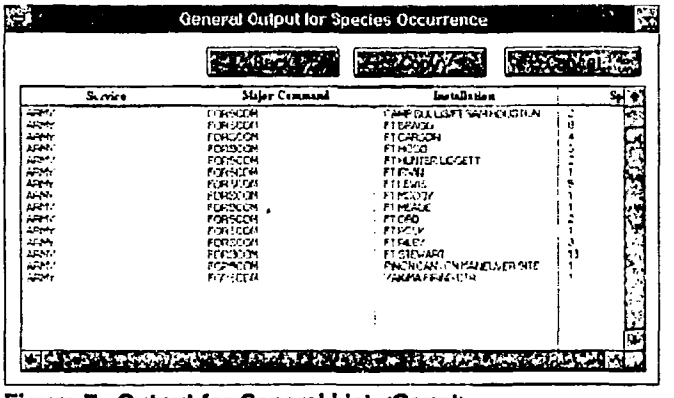


Figure 7. Output for General List <Count>.

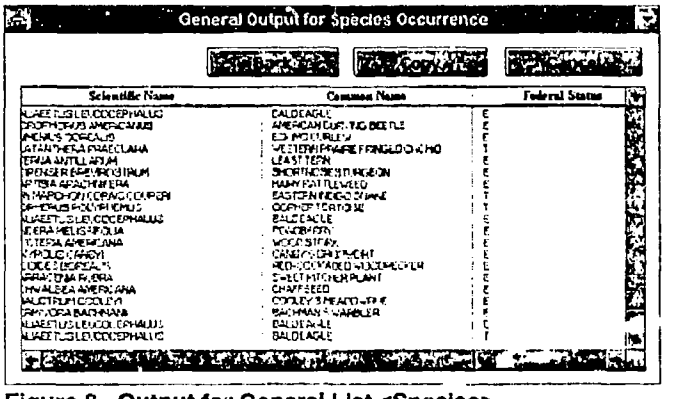


Figure 8. Output for General List <Species>.

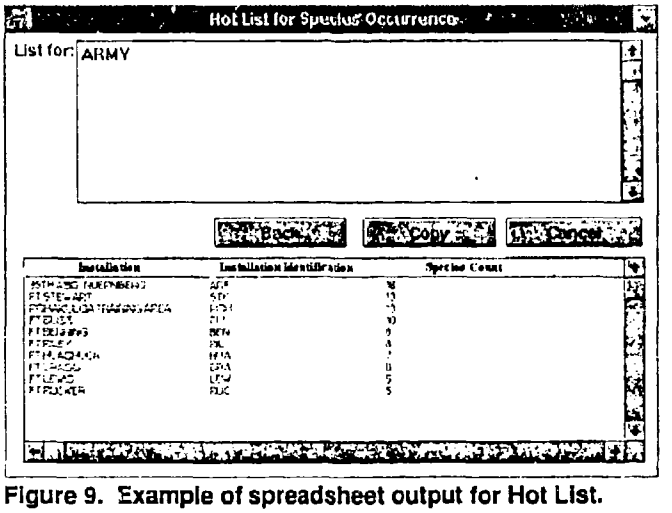


Figure 9. Example of spreadsheet output for Hot List.

and a listing of the distinct TES species that occur (<Species>). The <Count> button (Figure 7) provides a spreadsheet listing of the Service, Major Command, Installation, and Total Species Count. The <Species> button (Figure 8) provides a spreadsheet listing of the Service, Major Command, Installation, Scientific Name, Common Name, and Federal Status. The Hot List group box (Figure 6) answers two questions:

1. What are the top 10 installations with the most distinct TES species (<Installation>)?
2. What are the top 10 TES species found on all installations (<Species>)?

Spreadsheet information for <Installation> (Figure 9) includes the Installation, Installation Identification Code, and distinct Species Count, while the graph (Figure 10) plots this information. Spreadsheet inf ıation for <Species> includes the Scientific Name, Species Identification Code, and Total Installation Count, while the graph plots this information. The last summary type, <Category Groups> (Figure 6), organizes information by taxonomic category and is presented in both spreadsheet and graph format. Spreadsheet information (Figure 11) includes the Organization, Category, and distinct Species Count within each category, whereas the graph (Figure 12) presents distinct TES species counts by category.

How to access information. Species occurrence information can be accessed through the <Canned Queries> menu, by clicking on the <Species Occurrence> option (Figure 5). The overall flow for this option is depicted graphically in Figures B1 and B2. By selecting one of the organizational levels, the Species Occurrence Canned Queries dialog box (Figure 6) is opened. The Level of Interest list box is automatically populated by the previous menu choice and can only be changed by selecting another menu choice.

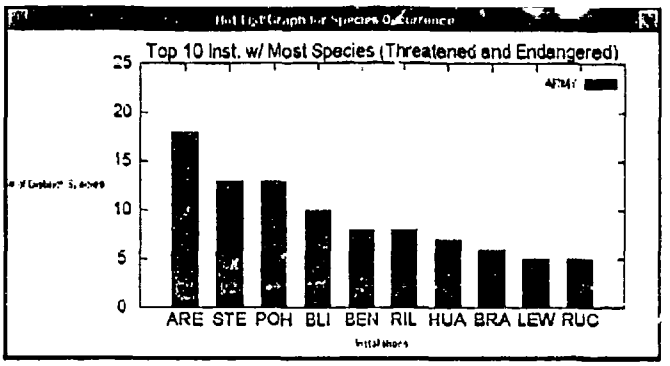


Figure 10. Example of graphical output for Hot List.

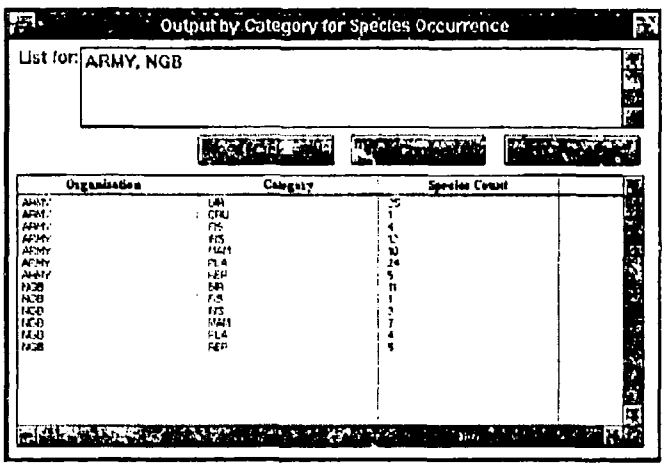


Figure 11. Spreadsheet output for <Category Groups>.

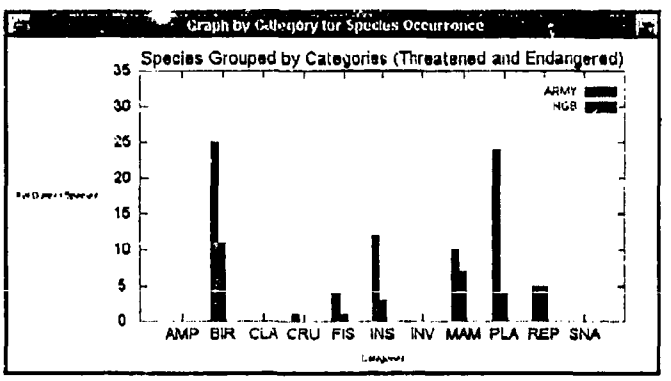


Figure 12. Graphical output for <Category Groups>.

Once the dialog box has been opened, the user must select at least one parameter from each of three list boxes (Selection within Level, Federal Status, and Year). Multiple selections are allowed only in the Selections within Level list box when using buttons in the General List group box or <Category Groups>. On the other hand, buttons in the Hot List group box allow only one selection from each of the three list boxes. Multiple noncontiguous selections within certain topic areas are made by holding the <Ctrl> key down while selecting the appropriate choices. Multiple contiguous selections within certain topic areas are made by holding the <Shift> key down while making the first and last selections.

Spreadsheet output screens for Species Occurrence Canned Queries (Figures 7, 8, 9, and 11) have three buttons in common: <Back>, <Copy>, and <Cancel>. The <Back> button returns the user to the previous dialog box, retaining the contents

of the Level of Interest list box. When using the <Back> button with spreadsheet and graph windows, both windows will close simultaneously and return the user to the Species Occurrence Canned Queries dialog box. The <Copy> button allows the user to copy selected spreadsheet contents to any wordprocessor or spreadsheet. Select the desired rows of information in the same manner as described above by using the <Ctrl> and <Shift> keys. The <Cancel> button will exit the user from this window, but not retain any of the information currently chosen. When using the <Cancel> button with spreadsheet and graph windows, only the spreadsheet window will be closed. The graph window must be closed separately by double clicking on the close box located in the upper lefthand corner.

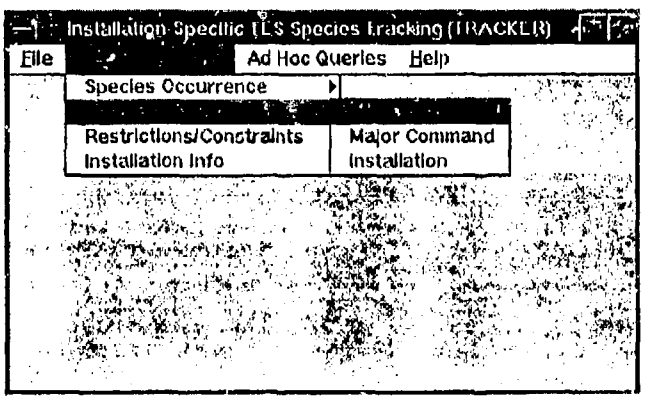


Figure 13. <Funding> Menu.

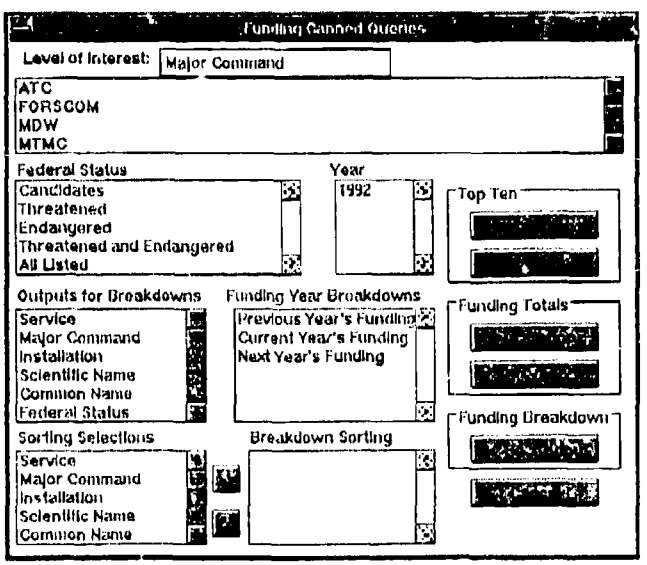


Figure 14. Funding Canned Query Dialog Box.

Funding

Description of output information. The Funding Canned Queries option (Figure 13) provides access to information that answers four basic questions on TES species funding (Appendix C) from two groups of information summaries, Top Ten group box and Funding Totals group box. The Top Ten group box (Figure 14) provides a summary of the top 10 installations with the most TES species funding (<Installation>), and the top 10 species that receive the most funding (<Species>). The <Installation> button provides a spreadsheet listing of the Installation, Installation Identification Code, and Funding Total ($K) (Figure 15), while the graph (Figure 16) plots this output information. The <Species> button provides a spreadsheet listing of the Scientific Name, Species Identification Code, and Funding Total ($K), while the graph plots this information. The Funding Totals

group box (Figure 14) contains two summaries that sort information on TES species funding either by taxonomic category <By Category> or by year <By Year>. Spreadsheet output information for the <By Category> button includes the Organization, Category, and Total Funding ($K), while the graph plots these data. Spreadsheet output information (Figure 17) for the <By Year> button includes the Organization, Funding 1991 ($K), Funding 1992 ($K), and Funding 1993 ($K). Figure 18 represents the total annual funding for TES species funding by year.

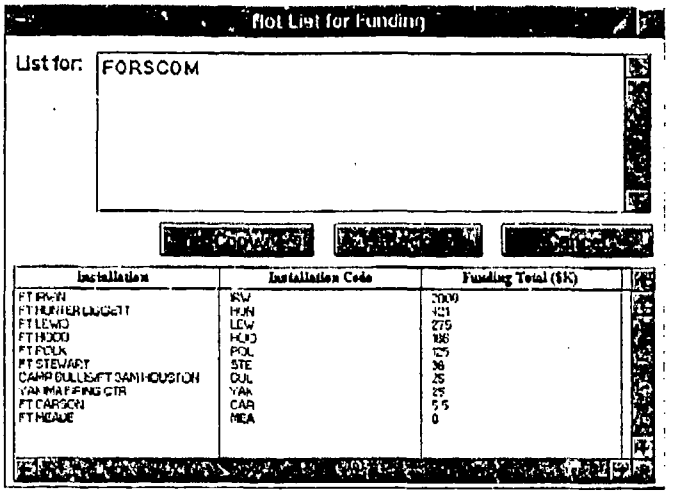


Figure 15. Spreadsheet output for Top Ten <Installation>.

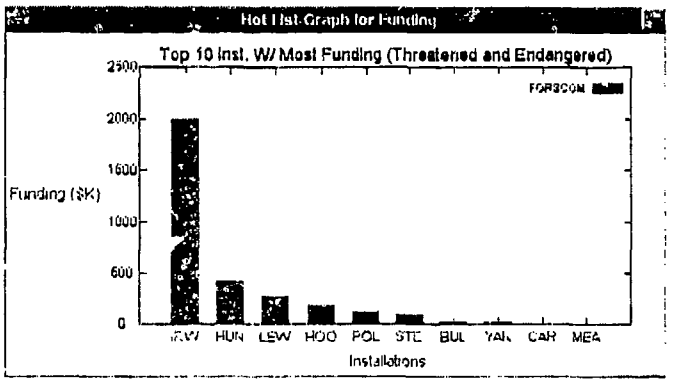


Figure 16. Graphical output for Top Ten <Installation>.

In addition to providing information on the four basic funding questions, an ad hoc query mechanism is provided through the Funding Breakdown group box (Figure 19). The ad hoc query mechanism provides the user a certain degree of freedom in defining and sorting output information parameters for summaries. Parameter choices include the Installation, Scientific and Common Name, Federal Status, Year, and Funding. The sorting order for output spreadsheet information can also be selected.

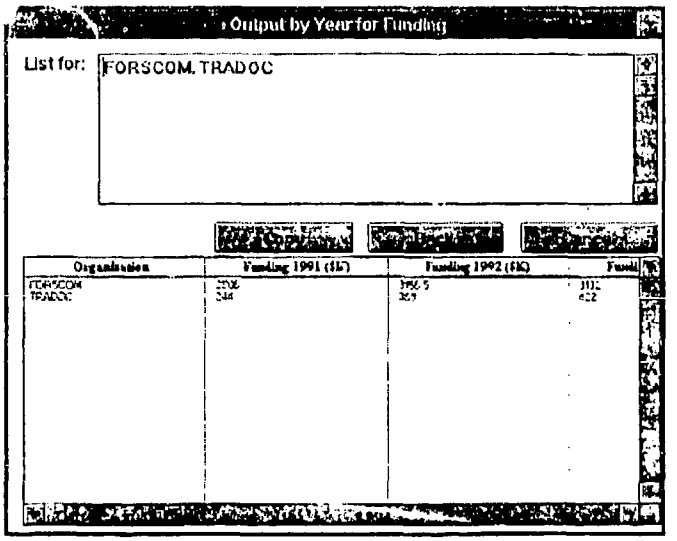


Figure 17. Spreadsheet output for Funding grouped by year.

How to access information. TES species funding information for installations and related work efforts can be accessed through the <Canned Queries> menu by clicking on the <Funding> menu option (Figure 13). The overall flow for this option is depicted

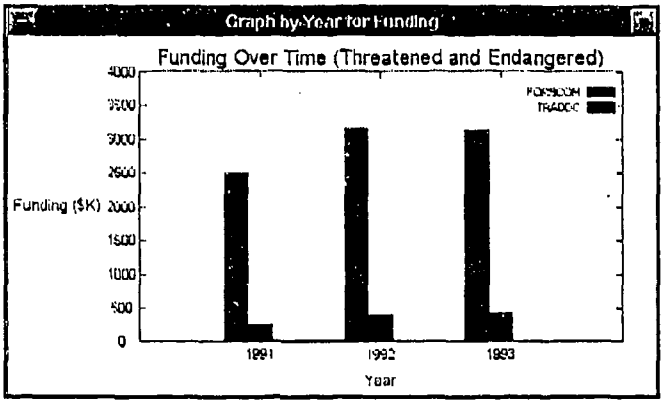


Figure 18. Graphical output for Funding grouped by year.

graphically in Figures B1 and B3. Selecting one of the organizational levels opens the Funding Canned Queries dialog box (Figure 14). The Level of Interest list box is automatically populated by the previous menu selection and can only be changed by making another menu selection.

Once the dialog box has been opened, the user can select various list boxes according to the desired output summary. The Funding Totals group box and Top Ten group box require entries in each of the three list boxes: Level of Interest, Federal Status, and Year. Multiple selections are allowed only in the Level of Interest list box. Multiple noncontiguous selections within certain topic areas are made by holding the <Ctrl> key down while selecting appropriate choices. Multiple contiguous selections within certain topic areas are made by holding the <Shift> key down while making the first and last selections.

The ad hoc output button (Figure 19) requires dialog box entries in each of seven list boxes, Level of Interest, Federal Status, Year, Outputs for Breakdowns, Funding Year Breakdowns, Sorting Selections, and Breakdown Sorting. The Level of Interest, Outputs for Breakdowns, Funding Year Breakdowns, and Breakdown Sorting list boxes allow multiple selections for this output summary. Both Sorting Selections and Breakdown Sorting list boxes are used together to define the sorting order of the output information. To select a particular sorting element, highlight the selection in the Sorting Selections list box and click once on the < >> > button to copy the chosen element to the Breakdown Sorting list box. The order of selections in the Breakdown Sorting list box will be the sorting order for the output information. If errors are made in the selection process, highlight the undesired selection in the Breakdown Sorting list box and click once on the < << > button to remove

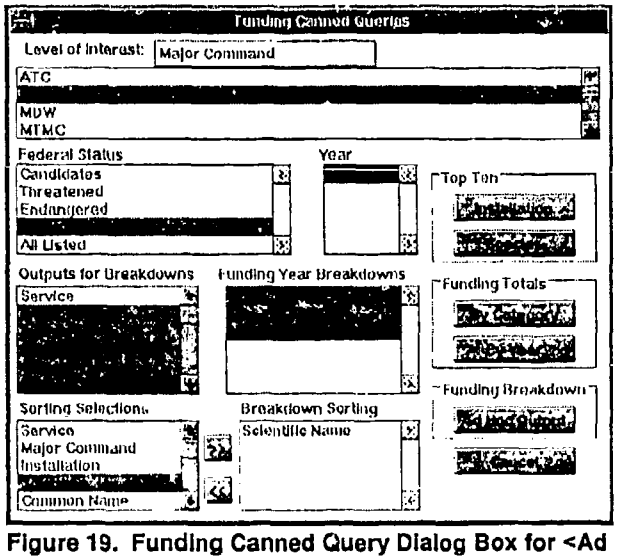


Figure 19. Funding Canned Query Dialog Box for <Ad Hoc Output>.

the selection. Once the appropriate selections have been made in the each of the seven list boxes, click on the <Ad Hoc Output> button to output the desired information to a spreadsheet format (Figure 20).

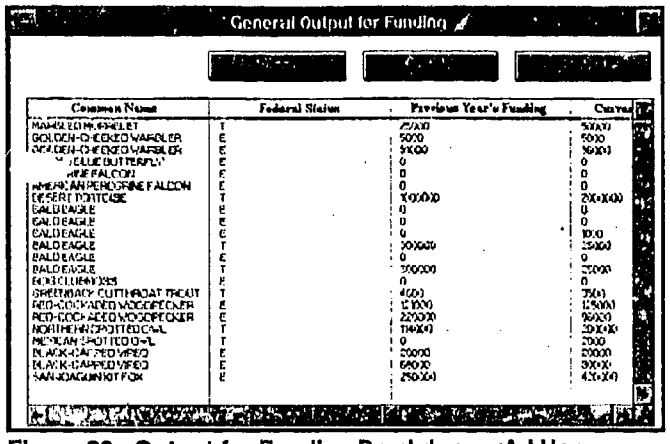


Figure 20. Output for Funding Breakdown <Ad Hoc Output>.

Spreadsheet output screens for Funding Canned Queries (Figures 15, 17, and 20) have three buttons in common: <Back>, <Copy>, and <Cancel>. The <Back> button returns the user to the previous dialog box, retaining the contents of the Level of Interest list box. The <Copy> button allows the user to copy selected spreadsheet contents to any word processor or spreadsheet. Select the desired rows of information in the same manner as described above by using the <Ctrl> and <Shift> keys. The <Cancel> button will exit the user from this window, but not retain any of the information currently chosen. When using the <Cancel> button with spreadsheet and graph windows, only the spreadsheet window will be closed. The graph window must be closed separately by double clicking on the close box located in the upper lefthand corner.

Restricted Acres and Mission Constraints

Description of output information. The Restrictions/Constraints Canned Queries option (Figure 21) provides the user with information on the number of restricted acres caused by TES species and how those species constrain current activities. Topic areas include:

1. Restricted Acres
2. Directorate of Engineering and Housing (DEH) overall mission constraints
3. Directorate of Planning and Training (DPT) training mission constraints
4. DPT non-training mission constraints.

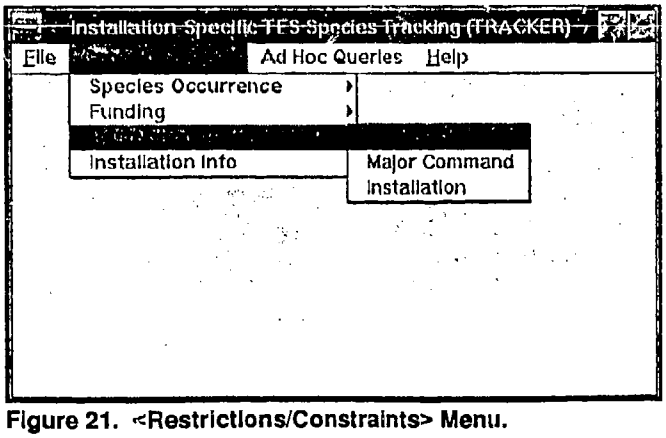


Figure 21. <Restrictions/Constraints> Menu.

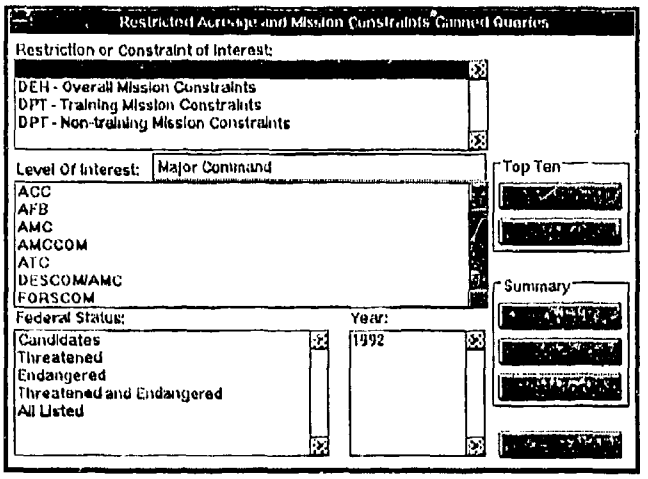


Figure 22. Acreage Restrictions Topic Area Dialog Box.

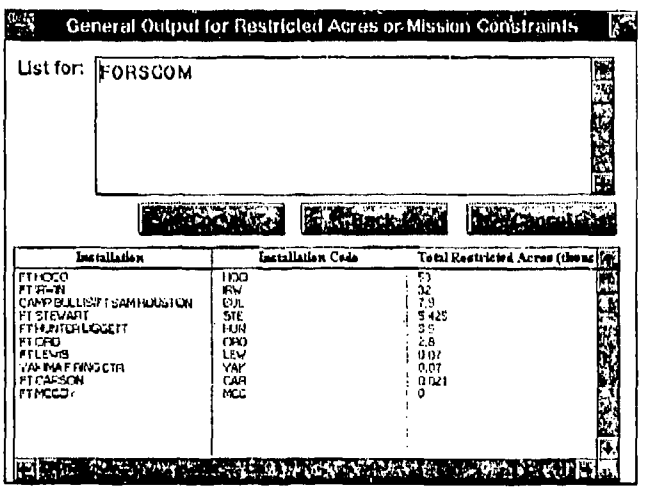


Figure 23. Spreadsheet output for Restricted Acres Top Ten <Installation>.

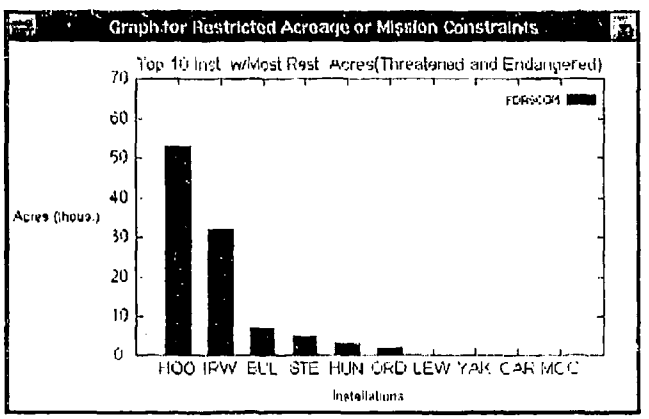


Figure 24. Graphical output for Restricted Acres Top Ten <Installation>.

Information for both training and non-training DPT mission constraints are measured in the same output format (increased, decreased, and unchanged since last year), and will therefore be referred to in the same context for the remainder of this section.

The Restricted Acres Canned Queries option (Figure 22) provides access to information that answers five general questions (Appendix C), via two group boxes —Top Ten and Summary. The Top Ten group box provides a summarized spreadsheet listing of Top Ten installations with the most restricted acres caused by TES species (<Installation>) and Top Ten individual TES species that restrict the most acres (<Species>). The <Installation> button provides a spreadsheet listing (Figure 23) and graph (Figure 24) of the installations and the total number of restricted acres. The <Species> button provides a spreadsheet and graph for the TES species and the total number of restricted acres. The Summary group box (Figure 25) provides answers to three questions in spreadsheet format:

1. How many acres are restricted on distinct installations (<Level>)?
2. How many acres are restricted by distinct species on installations (<Species>)?

3. How many acres are restricted by various taxonomic categories (<Category>)?

A spreadsheet listing (Figure 26) and graph (Figure 27) are also available for Restricted Acreage by Category.

The DEH overall mission constraints topic area (Figure 28) shows the annual trends in DEH mission constraints from TES species. The Summary group box provides information on the trends in overall mission constraints by all TES species, as stated by the environmental staff (<Level>). The <Level> button presents a spreadsheet listing (Figure 29) and graph (Figure 30) that includes Organization, Mission Constraints, and a Count of Installations.

Three questions are addressed (Appendix C) when selecting either DPT training or non-training mission constraints topic areas (Figures 31 and 32). The Summary group box consists of three distinct summaries of training and non-training activities, as reported by military trainers:

1. Trend in mission constraints by all TES species on distinct installations (<Level>)
2. Trend in mission constraints on distinct installations by individual TES species (<Species>)
3. Trend in mission constraints by TES species on installations

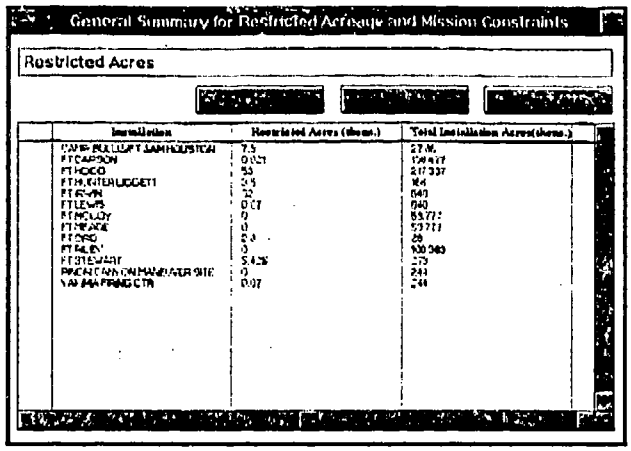


Figure 25. Output for Summary, <Level>, on Restricted Acres.

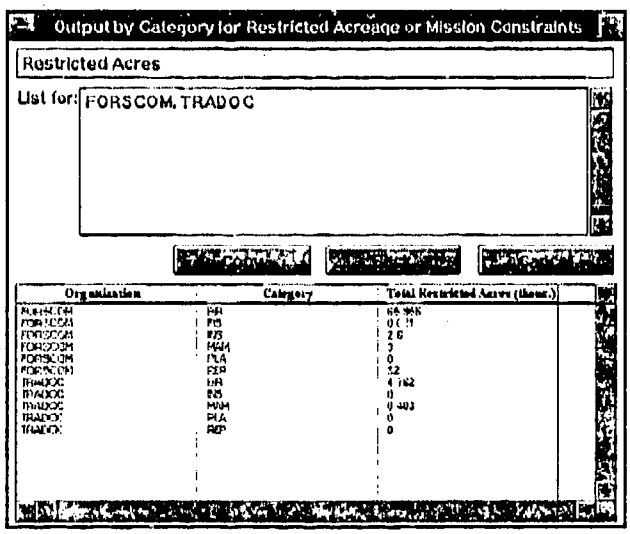


Figure 26. Spreadsheet output for Restricted Acreage grouped by category.

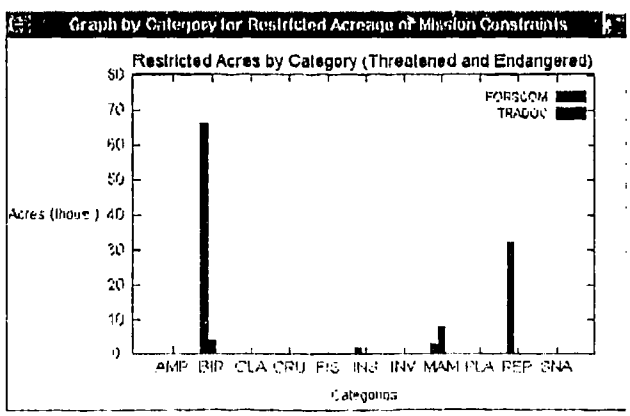


Figure 27. Graphical output for Restricted Acreage grouped by category.

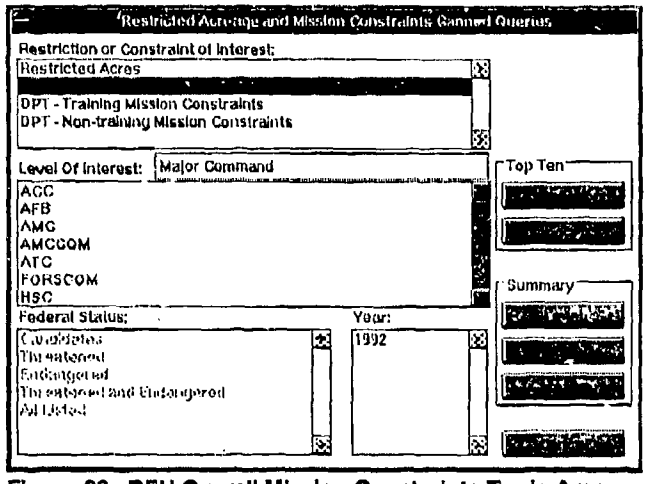


Figure 28. DEH Overall Mission Constraints Topic Area Dialog Box.

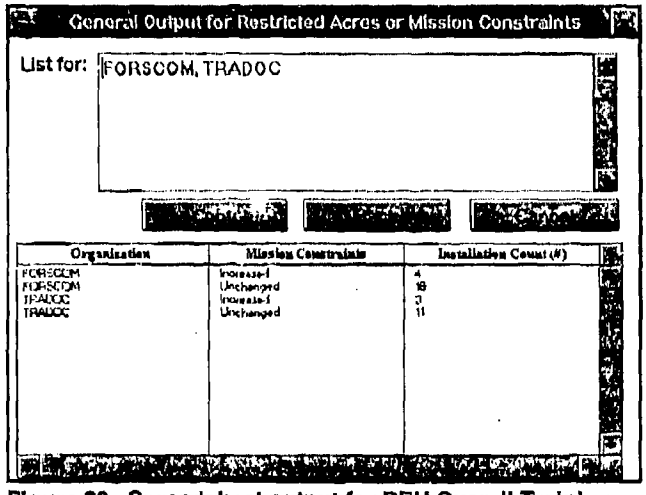


Figure 29. Spreadsheet output for DEH Overall Training Mission Constraints (Summary <Level>).

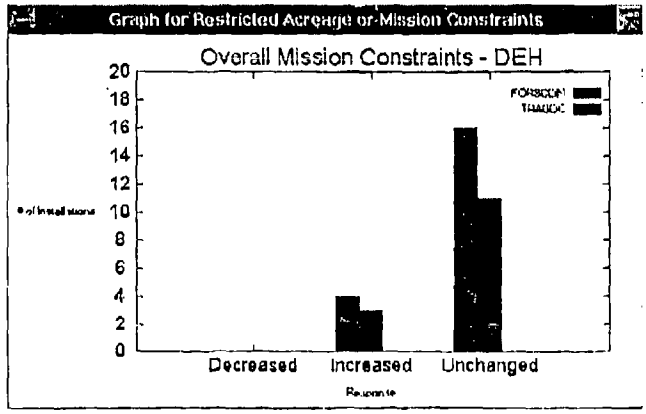


Figure 30. Graphical output for DEH Overall Training Mission Constraints (Summary <Level>).

grouped by category (<Category>).

The <Level> button presents a spreadsheet listing (Figure 33) and graph (Figure 34) that includes the Organization, Mission Constraints, and a Count of Distinct Species on Individual Installations. The <Species> button (Figure 35) presents a spreadsheet listing of the Organization, Scientific Name, Common Name, and Mission Constraints. The <Category> button organizes the information by taxonomic category, and presents the information in a spreadsheet (Figure 36) and graph (Figure 37) format.

How to access Information. Restricted Acres and Mission Constraints information can be accessed through the <Canned Queries> menu by clicking on the <Restrictions/Constraints> option (Figure 21). The overall flow for this option is depicted graphically in Figures B1 and B4. Selecting one of the organizational levels opens the Restricted Acres and Mission Constraints Canned Queries dialog box (Figure 22). However, before proceeding, the user must select one of the four topic areas from the list box. This selection will define the output information available, including Top Ten and Summary information, and information in the Level of Interest list box. If a

particular output summary or parameter (e.g., list box or button) is not available for the information topic, it will be grayed out and inaccessible.

Once a topic area has been selected, the Level of Interest list box will be populated with the organizational level that was selected earlier. The Restricted Acres option (Figure 22) requires information parameters from each of the three list boxes (Level of Interest, Federal Status, and Year). The Top Ten group box allows only single selections in each of the three list boxes; whereas the Summary group box allows multiple selections, but only in the Level of Interest list box. The DEH Overall Mission Constraints option (Figure 28) has only one button available, <Level>, but multiple selections can be made in the Level of Interest list box. Both DPT options, Training Mission Constraints (Figure 31) and Non-Training Mission Constraints (Figure 32) use all available buttons in the Summary group box. Multiple selections can be made in the Level of Interest list box when using the <Level> and <Species> buttons, but only single selections can be made for Federal Status and Year. The <Category> button, on the other hand, allows only single selections in each of the three list

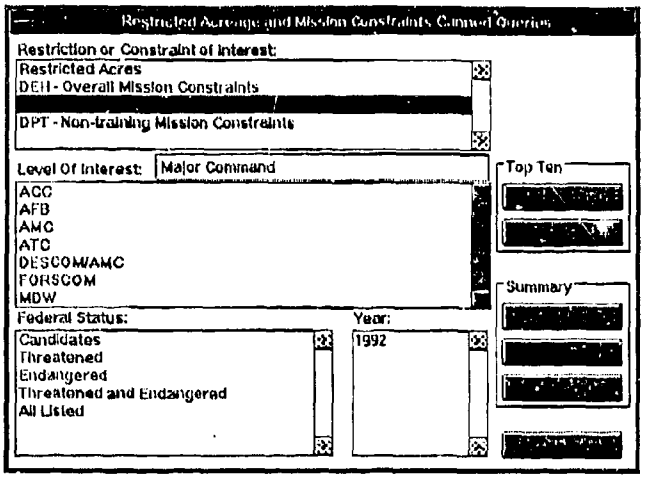


Figure 31. DPT Training Mission Constraints Topic Area Dialog Box.

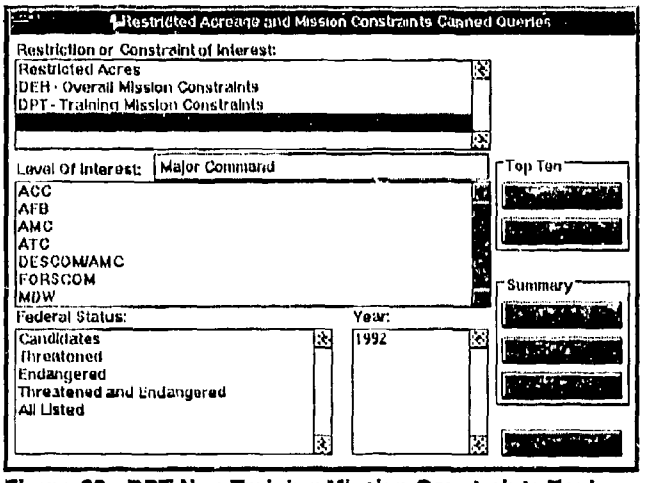


Figure 32. DPT Non-Training Mission Constraints Topic Area Dialog Box.

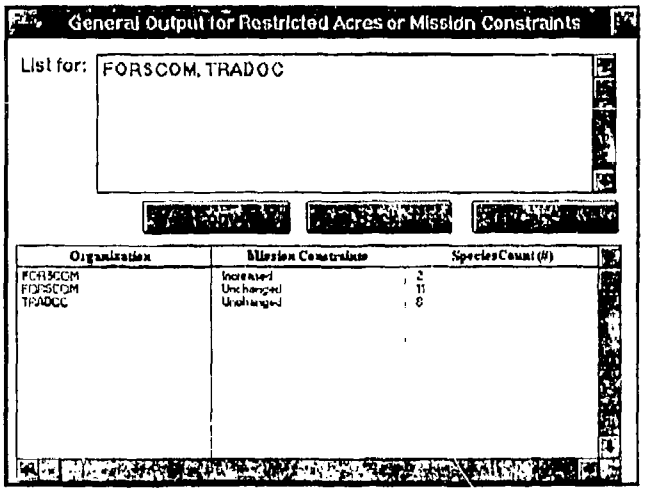


Figure 33. Spreadsheet output for DPT Training Mission Constraints (Summary <Level>).

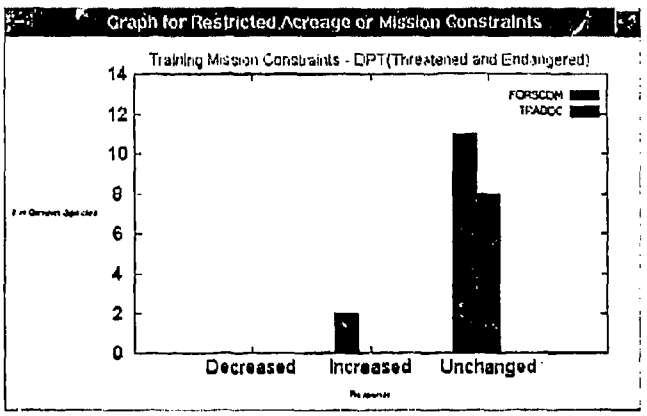


Figure 34. Graphical output for DPT Training Mission Constraints (Summary <Level>).

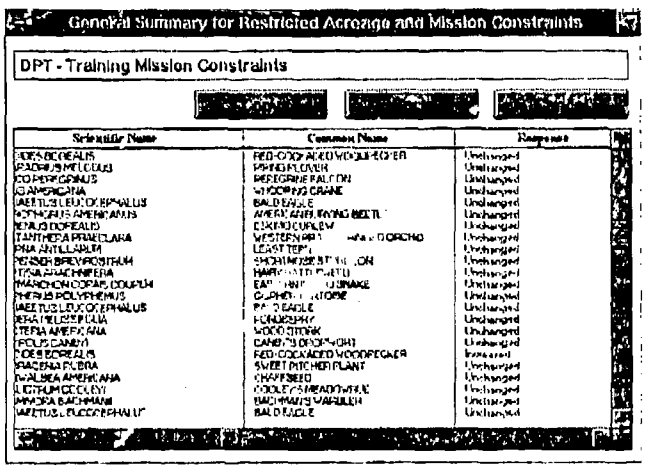


Figure 35. Spreadsheet output for DPT Training Mission Constraints (Summary <Species>).

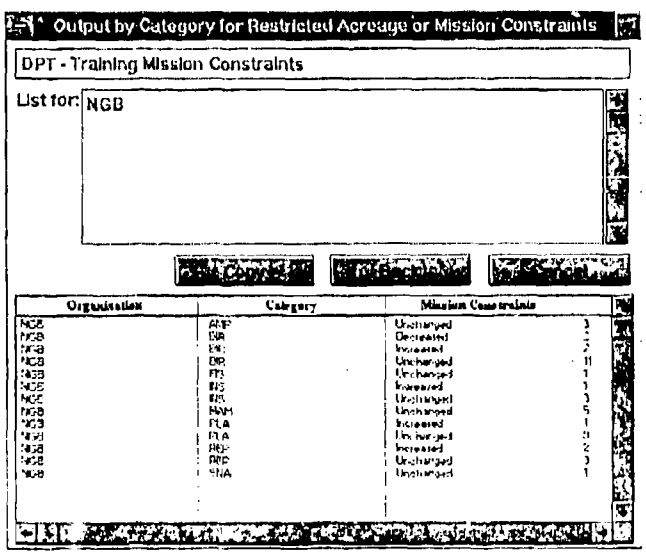


Figure 36. Spreadsheet output for DPT Training Mission Constraints grouped by category (Summary <Category>).

boxes. Multiple noncontiguous selections within certain topic areas are made by holding the <Ctrl> key down while selecting the appropriate choices. Multiple contiguous selections within certain topic areas are made by holding the <Shift> key down while making the first and last selections.

Spreadsheet output screens for Restricted Acres and Mission Constraints Canned Queries (Figures 23, 25, 26, 29, 33, 35, and 36) have three buttons in common, <Back>, <Copy>, and <Cancel>. The <Back> button returns the user to the previous dialog box, retaining the contents of the Level of Interest list box. When using the <Back> button with spreadsheet and graph windows, both windows will close simultaneously and return the user to the Restricted Acres and Mission Constraints Canned Queries dialog box. The <Copy> button allows the user to copy selected spreadsheet contents to any word-processor or spreadsheet. Select the desired rows of information in the same manner as described above by using the <Ctrl> and <Shift> keys. The <Cancel> button will exit the user from this window but will not retain any of the information currently chosen. When using the <Cancel> button with spreadsheet and graph windows, only the spreadsheet

window will be closed. The graph window must be closed separately by double clicking on the close box of that window.

General Installation Information

Description of output information. The Installation Information Canned Queries option (Figure 38) provides access to general information on installations (Appendix C). Available information includes the Installation name, Service, Major Command, State, Counties, and Total Acreage (Figure 39). Output information from the two organizational levels, <Service> and <Major Command>, is listed in spreadsheet format (Figure 40).

How to access information. Installation information can be accessed through the <Canned Queries> menu, by clicking on the <Installation Info> option (Figure 38). The overall flow for this option is depicted graphically in Figures B1 and B5. Selecting one of the organizational levels opens the Installation Canned Queries dialog box (Figure 39). The Search Level list box is automatically populated by the previous menu choice and can only be changed by selecting another menu choice.

Once the dialog box has been opened, the user can select

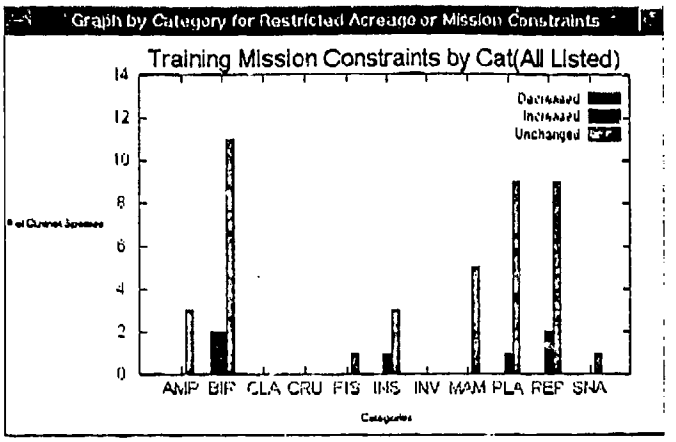


Figure 37. Graphical output for DPT Training Mission Constraints grouped by category (Summary <Category>).

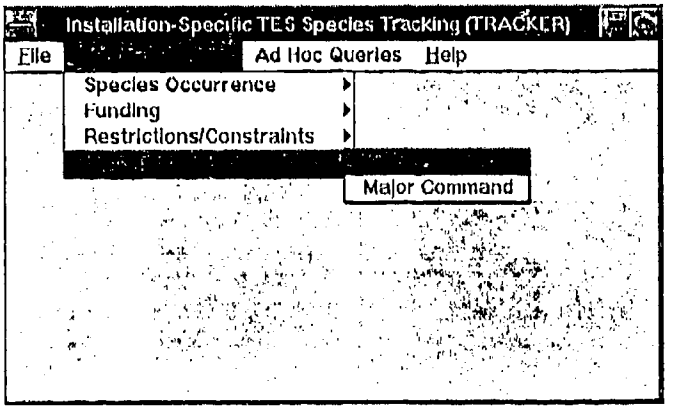


Figure 38. <Installation Info> Menu.

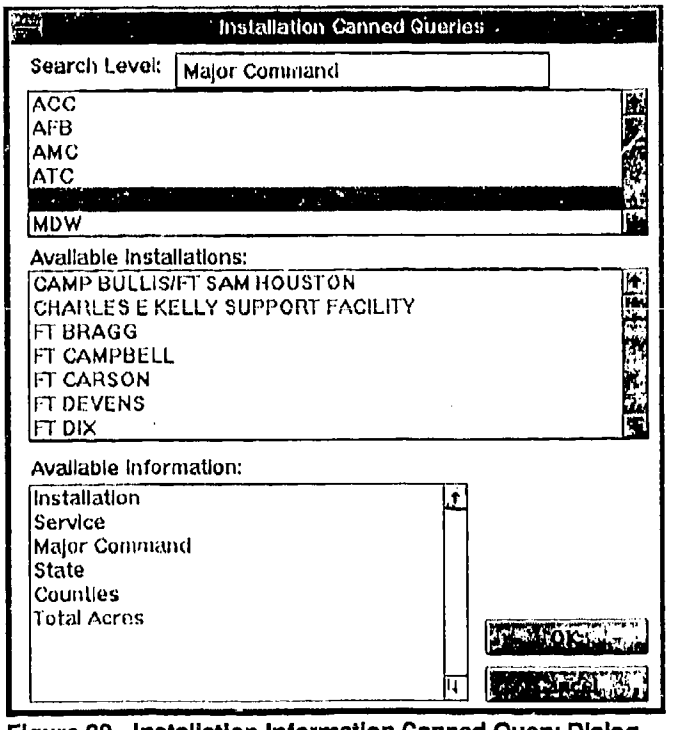
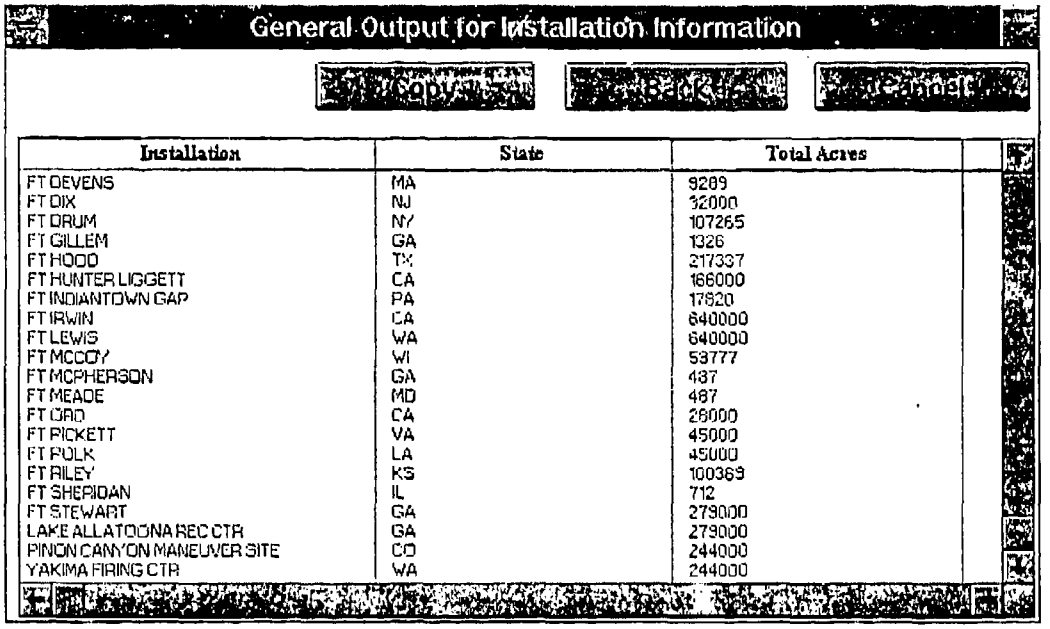


Figure 39. Installation Information Canned Query Dialog Box.



Installation	State	Total Acres
FT DEVENS	MA	9289
FT DIX	NJ	32000
FT DRUM	NY	107265
FT GILLEM	GA	1326
FT HOOD	TX	217337
FT HUNTER LIGGETT	CA	166000
FT INDIANTOWN GAP	PA	17820
FT IRWIN	CA	640000
FT LEWIS	WA	640000
FT MCCOY	WI	58777
FT MCPHERSON	GA	487
FT MEADE	MD	487
FT ORD	CA	28000
FT PICKETT	VA	45000
FT POLK	LA	45000
FT RILEY	KS	100369
FT SHERIDAN	IL	712
FT STEWART	GA	279000
LAKE ALLATOONA REC CTR	GA	279000
PINON CANYON MANEUVER SITE	CO	244000
YAKIMA FIRING CTR	WA	244000

Figure 40. Output for Installation Information.

parameters from each of the three list boxes (Selection within Level, Available Installations, and Available Information). First, the user must choose from the Selection within Level. The Available Installations list box will then be populated with a subset of installations based on the previous selection. Both the Available Installations and Available Information list boxes allow multiple selections and require selections to retrieve information. Multiple noncontiguous selections within one topic area are made by holding the <Ctrl> key down while selecting appropriate choices. Multiple contiguous selections within one topic area are made by holding the <Shift> key down while making the first and last selections. Once selections have been made in the Available Installations and Available Information list boxes, click on the <OK> button to proceed to the output screen.

The Installation Information output screen (Figure 40) has three buttons in common: <Back>, <Copy>, and <Cancel>. The <Back> button returns the user to the previous dialog box, retaining the contents of the Search Level. To change the Search Level, the user must return to the main menu and reselect from the <Installation Info> option, as described earlier in this section. The <Copy> button allows the user to copy selected spreadsheet contents to any wordprocessor or spreadsheet. Select the desired rows of information in the same manner as described above by using the <Ctrl> and <Shift> keys. The <Cancel> button will exit from this window but will not retain any of the information currently chosen.

Ad Hoc Queries

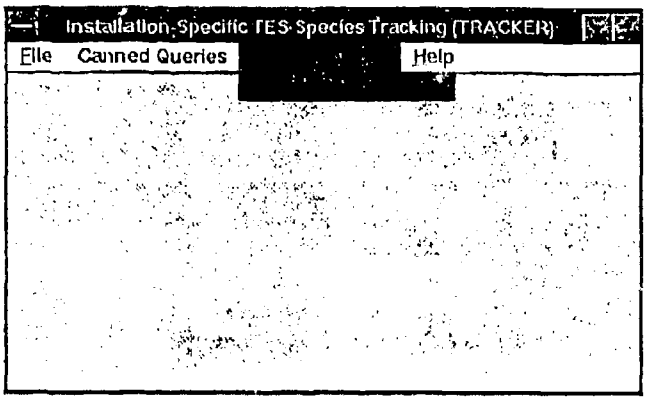


Figure 41. Ad Hoc Queries <Species Occurrence> Menu.

Description of Output Information

The <Ad Hoc Queries> mechanism (Figure 41) was developed for conducting searches for specialized information. By using this query mechanism, the user can create a customized series of parameters (e.g., installations, species, Federal status, states, etc.) under a single topic area <Species Occurrence>. This allows the user to customize, answer more questions, and perform greater individual output analyses, than could be accomplished from the Canned Queries menu alone. Examples of potential questions include:

1. Which installations have a particular species?
2. What is the state and Federal status of individual species?
3. Which installations reside in a given state?

How To Access Information

Retrieving information from the Ad Hoc Queries mechanism involves three steps. First, the user must develop a query to identify specific parameters, output information, and sorting mechanisms. Second, the user reviews the raw data retrieved from the database to verify applicability to the specialized request. At this stage, the user can either progress to the final stage, or develop a new query that may be more applicable to the users needs. Lastly, the user develops a final summary of the raw data.

Developing a query. Ad hoc query information can be accessed through the <Ad Hoc Queries> menu, by clicking on the <Species Occurrence> option (Figure 41). The Species Occurrence Ad Hoc Queries dialog box (Figure 42) will open after a short delay, while retrieving current information from the database. This dialog box represents the selection of specific parameters (i.e., the "where clause" portion of the query). Five list boxes are presented upon initial startup—Level, Organism, Status, Year, and State. To populate the Level Choice, Organism Choice, and Status Choice list boxes with information from the database, the user must select an option from each of the list boxes to the immediate left (Level, Organism, and Status). For example, by selecting Service in the Level list box, a list of Services from the

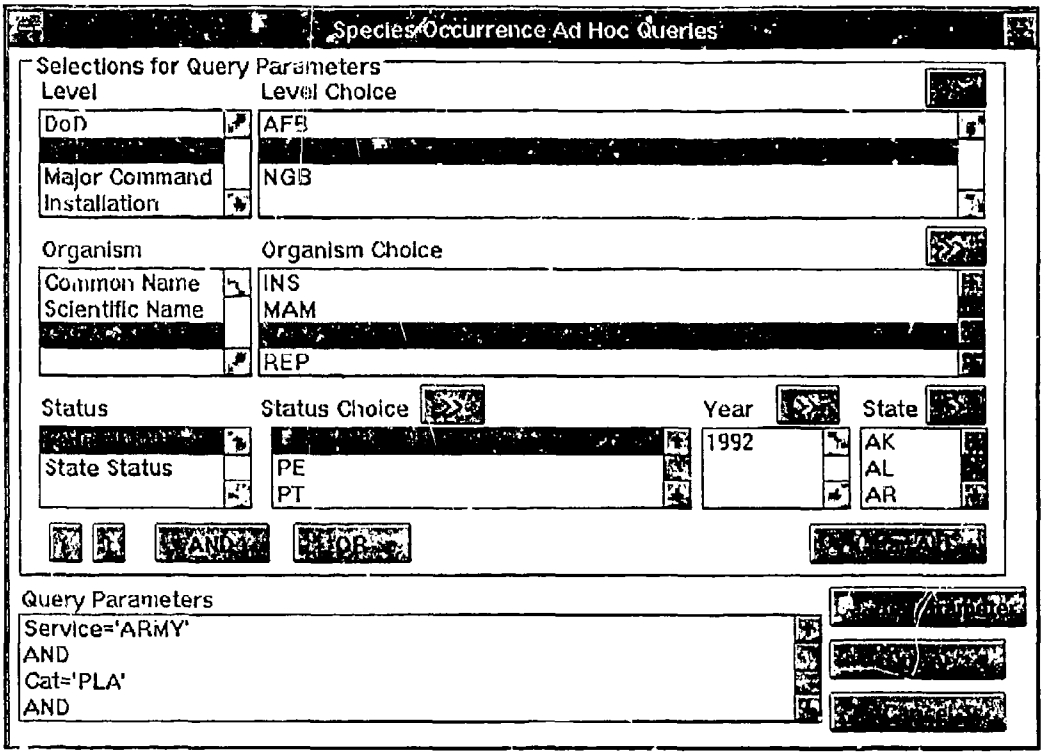


Figure 42. Species Occurrence Ad Hoc Query Dialog Box.

database is populated in the Level Choice list box. The other two categories are populated in a similar manner. Input elements in the Query Parameters list box can be selected from five list boxes, including Level Choice, Organism Choice, Status Choice, Year, and State. To clear all current selections in the top five list boxes, click once on the <Clear All> button.

The Query Parameters list box is populated as the user selects various parameters and logical operators. Logical operators are functions that join parameters (e.g., < (>, <) >, <AND>, and <OR>). Individual selections from each of the list boxes are made by clicking once on the selection and then clicking on the < >> > button, or simply by double clicking on individual selections. Parentheses are used to develop a subset of information that is exclusive from all other parameters. For example, "(Service='ARMY' OR Service='NGB')" obtains information on installations that are either Army or National Guard Bureau. The <AND> operator acts as an intersection operation (e.g., "(Service='ARMY' OR Service='NGB') AND Fed_stat='E'"). This statement obtains information that fulfills two parameters—installations within the Army or National Guard Bureau and all species having a Federal status of Endangered. The <OR> operator acts as a union operator (i.e., the information exists within either parameter). A graphical depiction of this concept is shown in Appendix D.

For further information on structured query language (SQL), see the user's manual for the database engine or a reference manual on SQL language. To include any one of the logical operators in the Query Parameters list box, simply click once on the appropriate < (>, <) >, <AND>, or <OR> button. If mistakes are made while developing Query Parameters, individual selections can be removed by using the <Delete Parameter> button, located to the right of the Query Parameters list box. Highlight the parameter you want removed and click once on the <Delete Parameter> button. After Query Parameters have been developed, click once on the <Query> button, located in the lower right-hand corner of the dialog box, to continue the query development process. The <Cancel> button, located in the lower right-hand corner of the dialog box, exits the user from this window but does not retain any of the information currently chosen.

The Output Selections dialog box (Figure 43) was developed so the user can select the desired output information (i.e., the "select" portion of the query). The available output information topic areas include DoD, Service, Major Command, Installation, Common Name, Scientific Name, Category, Federal Status, State Status, Year, and State. Multiple noncontiguous selections within one topic area are made by holding down the <Ctrl> key while selecting appropriate choices. Multiple contiguous selections within one topic area are made by holding down the <Shift> key while making the first and last selections.

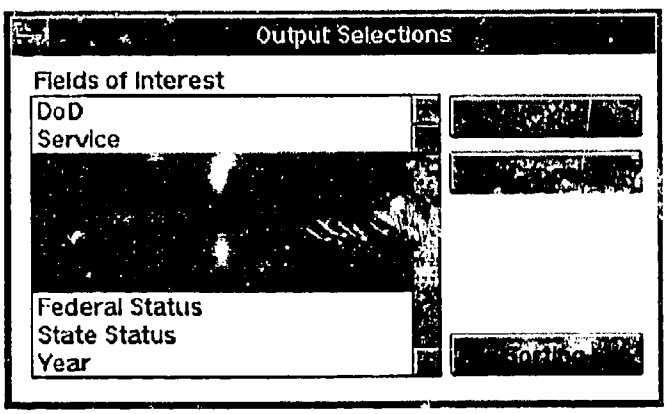


Figure 43. Output Information Section Dialog Box.

The <Sorting> button allows the user to select the desired sort order for the information. Once the button has been clicked, the Query Sorting Selections dialog box (Figure 44) will open. Available sorting elements for output information topic areas are similar to those listed above. To select sorting elements, the user must choose a single selection in the Column List box and click once on the < >> > button. The selection will then appear in the

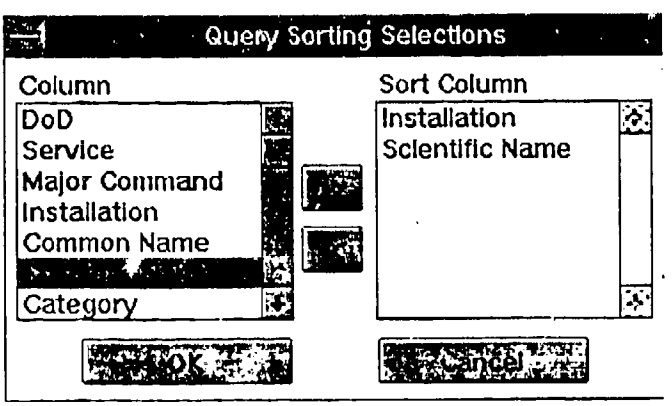


Figure 44. Sorting Selection Dialog Box.

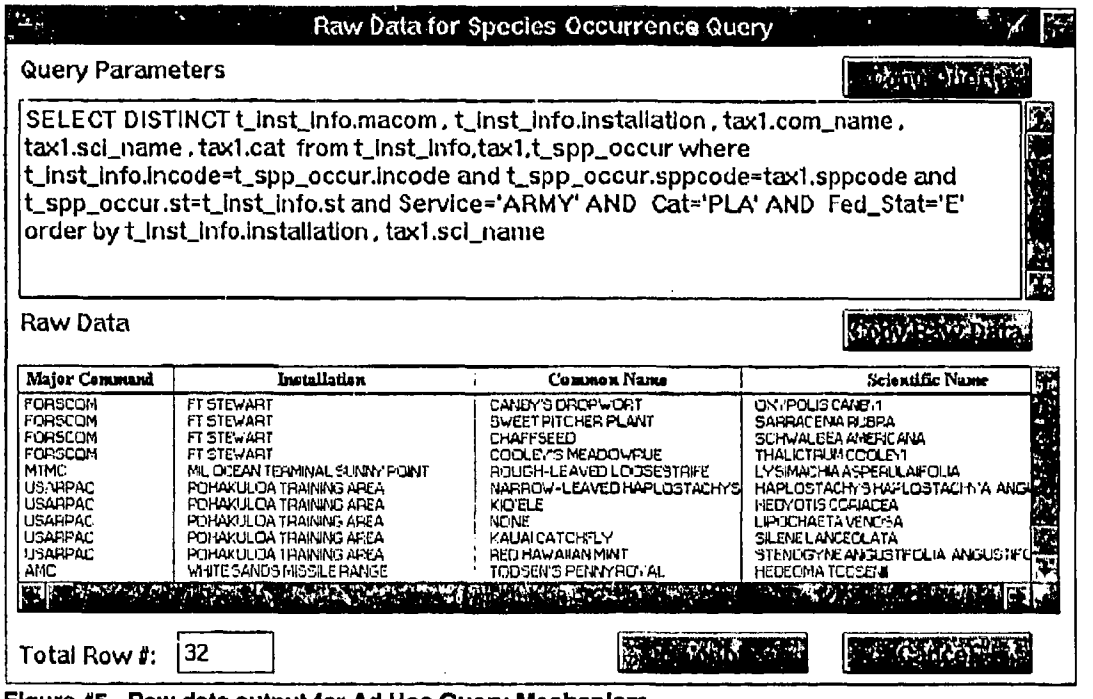


Figure 45. Raw data output for Ad Hoc Query Mechanism.

Sort Column. Additional selections can be made in a similar manner, but remember that the order of selections will also be the sorting order for the information. To remove selections from the Sort Column list box, simply highlight the undesired selection and click once on the < << > button. However, selections in the Sort Column list box must be a subset or match of the output information topic areas selected in the Output Selections dialog box (Figure 43). Once the output information and sorting elements have been selected, the query is ready to be executed. The user can proceed to view the raw data by clicking on the <OK> button in the Output Selections dialog box. The <Cancel> button will exit the user from this window, without saving any of the current information, and return the user to the Species Occurrence Ad Hoc Queries dialog box.

Reviewing raw data. The Raw Data for Species Occurrence Query dialog box (Figure 45) presents the user with raw data from the query developed in the last few steps. The three main components to this window are Query Parameters, Raw Data, and Total Row Number (#). The Query Parameters edit box contains the completed query that was used to obtain the raw data. Columns in the Raw Data spreadsheet option represent selections made from the Output Selections dialog box (Figure 43). The Total Row # indicates the number of rows, or records, that satisfy the chosen parameters. Two explanations may be given if the spreadsheet does not contain any records. First, the query may have too many parameters or is too specific to retrieve matches per the request. Second, there may be an error in the query structure. In

either case, the user should first check the query within the Query Parameters edit box and make necessary modifications in the Ad Hoc Queries dialog box. Once the desired information has been viewed, the user may proceed to the final step of developing summaries by clicking on the <Count> button.

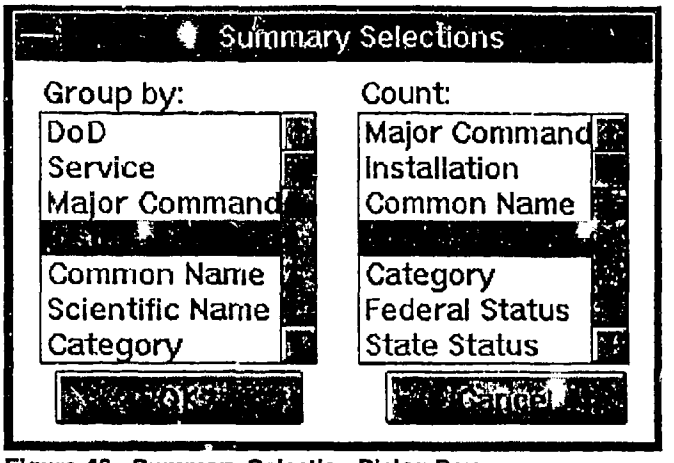


Figure 46. Summary Selection Dialog Box.

Two copy buttons are available in this dialog box, <Copy Query> and <Copy Raw Data>. The <Copy Query> button allows the user to save queries in a database manager for future use. Highlight the query and then click on the <Copy Query> button to copy information to a wordprocessor. The <Copy Raw Data> button allows the user to copy selected spreadsheet contents to any word-processor or spreadsheet. Select the desired rows of information in the same manner as described above by using the <Ctrl> and <Shift> keys. To modify existing parameters, the user must click on the <Cancel> button and return to the Species Occurrence Ad Hoc Queries dialog box.

Final summary on raw data. The <Count> button allows the user to run simple counts on a variety of information. When the Summary Selections dialog box (Figure 46) opens, two list boxes appear, Group By and Count. The Group By list box allows the user to select output columns for the final data set. Selected columns must match, or be a subset of, the original raw data columns. Multiple selections are allowed. The Count list box, on the other hand, does not allow multiple selections, and the user can choose only one parameter at a time. Once selections have been made from both list boxes, the user may proceed by clicking once on the <OK> button. To disregard choices made in the Summary Selections dialog box, simply click once on the <Cancel> button. This action will return the user to the Raw Data for Species Occurrence Query dialog box (Figure 45).

The Summary for Ad Hoc Species Occurrence Queries window (Figure 47) presents the summarized information in a spreadsheet format. Two buttons, <Copy> and <Close>, are presented in this dialog box. The <Copy> button allows the user to copy selected spreadsheet contents to any wordprocessor or spreadsheet. Select the desired rows of information in the same manner as described above by using the <Ctrl> and <Shift> keys. Three explanations may be given if the spreadsheet does not contain any records. First, the query may not be correct. Second, the columns

selected in the Group By list box of the Summary Selections dialog box may not match or be a subset of the original raw data columns. Lastly, the selected counting element from the Count list box of the Summary Selections dialog box may not be valid. Retracing the query development process, as stated throughout this section, will help in finding the problem. In any case, the <Close> button will exit the user from the current window and return them to the Raw Data for Species Occurrence Query dialog box. At this point, the query can be visually checked for problems, or new queries developed.

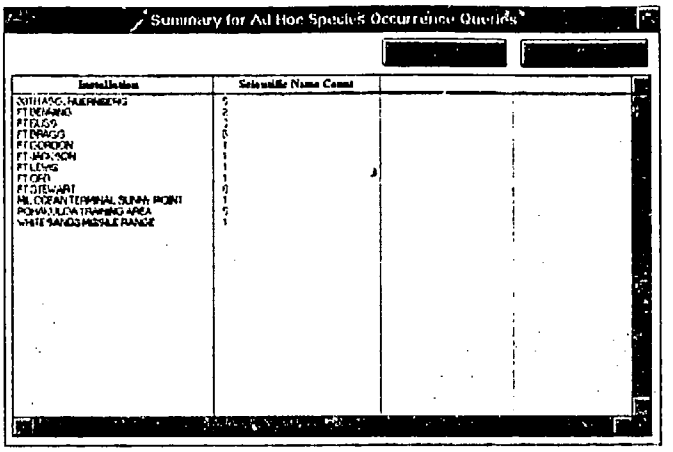


Figure 47. Spreadsheet output for Species Occurrence Ad Hoc Query Mechanism.

Help Menu - About Box

The About Box (Figure 48) provides information similar to that in the introductory dialog box (Figure 2), except for the names of developers and contributors. This dialog box can be accessed through the <Help> selection of the main menu by clicking on the <About...> option. Proceed by clicking on the <OK> button, located in the lower righthand corner.

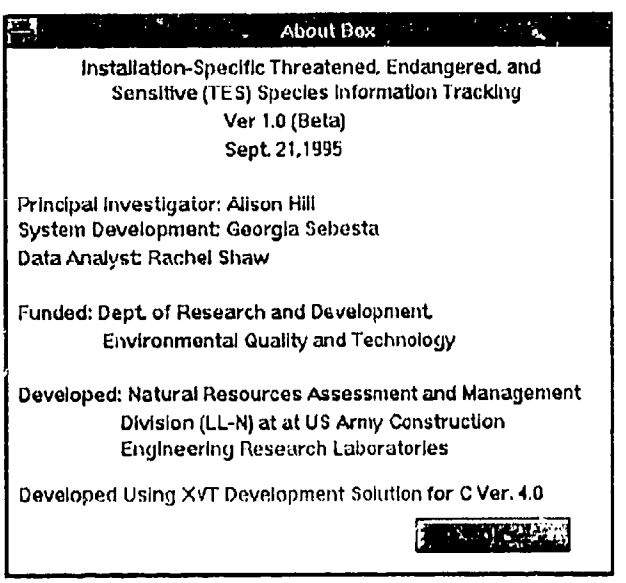


Figure 48. About Box for TRACKER's Query and Summary Component.

6 Using the Automated Input Forms Component

The Automated Input Forms component is designed to support the Query and Summary component by providing a direct mechanism for data entry into a database. A series of dialog boxes prompt the user to enter specific details on <Species Occurrence>, <Funding>, <Mission Constraints>, and <Restricted Acres>. Associated forms for these topic areas are accessed through the <Data Entry> menu and provide an initial series of automated data checking and validation steps. Information is then entered into a temporary TES species database, where it can be used by the TRACKER Query and Summary component. In addition to annual information on existing installations and TES Species, forms for incorporating <New Installations> or <New Species> (Figure 49) are also provided. Menu selections <File> (<Exit>), <Data Entry>, <New Information>, and <Help> (<About...>) are discussed below.

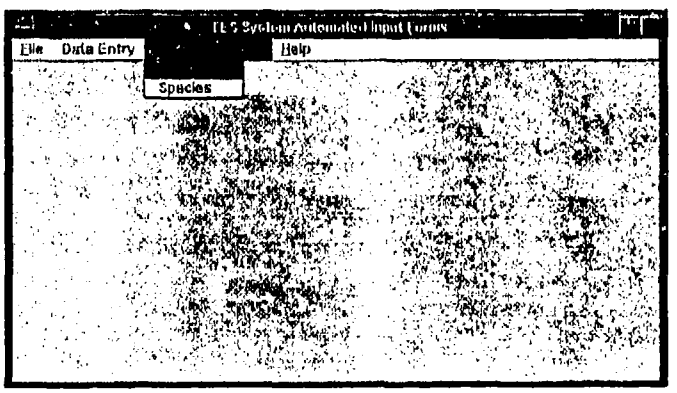


Figure 49. New Information <Installation> and <Species> Menu.

File Menu - Exiting the Program

The <Exit> command (Figure 50), under <File>, closes and ends the program.

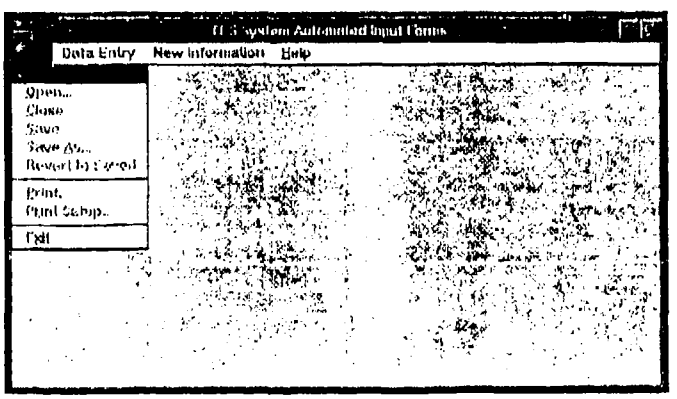


Figure 50. <Exit> Menu.

Data Entry

Input forms on topic areas <Species Occurrence>, <Funding>, <Mission Constraints>, and <Restricted Acres> can be accessed through the <Data Entry> menu (Figure 51). Each topic area has

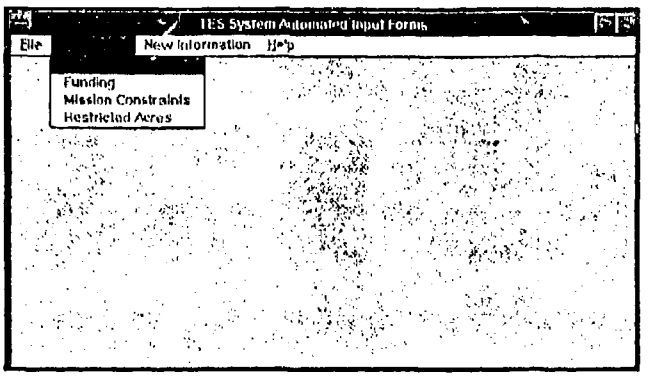


Figure 51. Data Entry (<Species Occurrence>, <Funding>, <Mission Constraints>, <Restricted Acres>) Menu.

a distinct input form but can handle only one installation and one species at a time. Therefore, users may need to fill out each form several times and are encouraged to enter information in all input form fields.

Species Occurrence

Information requested. The Species Occurrence input form (Figure 52) prompts the user for five distinct pieces of information, Installation, Species Scientific Name, Current Year, Species Occurrence, and Type of Occurrence. The Installation list box displays a listing of installations in the database. The Species list box displays a listing of scientific names in the database. The Current Year list box serves as a year date stamp for the information. The Species Occurrence list box contains two choices, Known or Suspected, regarding individual TES species and their occurrence on the installation. The Type of Occurrence list box refers to the species residency status (Seasonal, Permanent, and Accidental Tourist) on the installation. Definitions for the individual list box choices are defined in Appendix F.

How to enter information. The Species Occurrence input form (Figure 52) can be opened through the <Data Entry> menu by clicking on the <Species Occurrence> option (Figure 51). Selections can then be made from each list box—Installation, Species Scientific Name, Current Year, Species Occurrence, and Type of Occurrence. Once a specific species has been selected from the Species Scientific Name list box, the common name will automatically appear in the Common Name list box. However, users should check both the scientific and common name for accuracy. If an installation or species is not available in the current list box, the user should refer to the New Information section of this chapter for adding new occurrences.

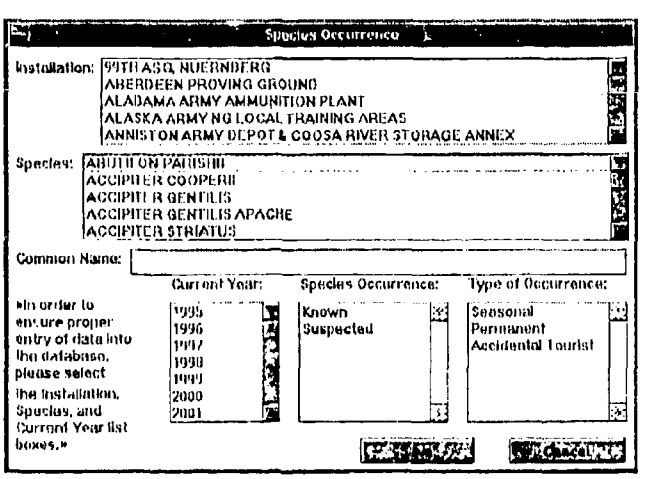


Figure 52. Species Occurrence Input Form.

Two buttons—<Save> and <Cancel>—are available on the Species

Occurrence input form. After the necessary information has been entered, click on the <Save> button to begin committing the information to the database. This button will then prompt the Save dialog box (Figure 53) and ask for verification. If the information is correct, select <OK> to finish the commit process. If the information is not correct, or if changes need to be made, simply select the <Cancel> button on the Save dialog box. The user will then be returned to the Species Occurrence dialog box, without committing any of the new information. The user can reenter the appropriate information, or hit the <Cancel> button to exit this window, without retaining the current information.

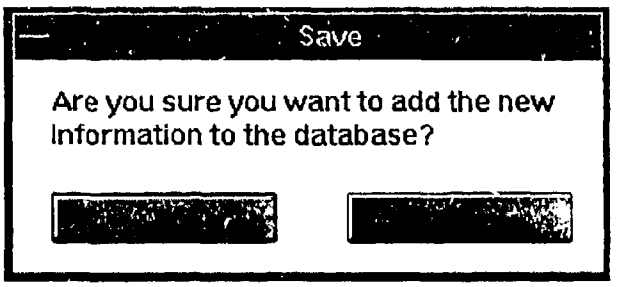


Figure 53. Save Verification Dialog Box.

Funding

Information requested. The Funding input form (Figure 54) prompts the user for six distinct pieces of information—Installation Name, Scientific Name, Previous Year's Funding, Current Year's Funding, Next Year's Funding, and Current Year. The Installation list box displays a listing of installations in the database. The Species list box displays a listing of scientific names in the database. The Previous Year's Funding, Current Year's Funding, and Next Year's Funding list boxes prompt the user to enter the total yearly funding amount. The Current Year list box serves as a date stamp for the information. Definitions for the individual list box choices are defined in Appendix F.

How to enter information. The Funding input form (Figure 54) can be opened through the <Data Entry> menu, by clicking on the <Funding> option (Figure 51). Selections from each list box, Installation Name, Scientific Name, and Current Year, can then be made. Once a specific species has been selected from the Species Scientific Name list box, the common name will automatically appear in the Common Name list box. However, users should check both the scientific and common name

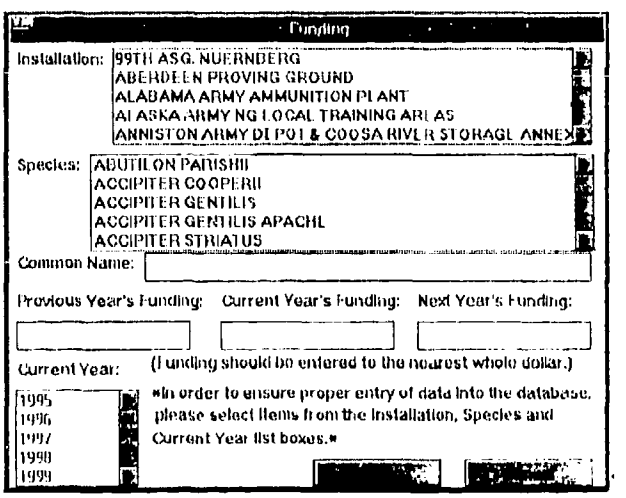


Figure 54. Funding Input Form.

for accuracy. If an installation or species is not available in the current list box, the user should refer to the New Information section of this chapter for adding new occurrences. The Previous Year's Funding, Current Year's Funding, and Next Year's Funding list boxes prompt the user to enter the total yearly funding amounts to the nearest whole dollar.

Two buttons—<Save> and <Cancel>—are available on the Funding input form. Once the necessary information has been entered, click on the <Save> button to begin committing the information to the database. This button will then prompt the Save dialog box (Figure 53) and ask for verification. If the information is correct, select <OK> to finish the commit process. If the information is not correct, or changes need to be made, simply select the <Cancel> button on the Save dialog box. The user will be returned to the Funding dialog box, without committing any of the new information. The user can reenter the appropriate information, or hit the <Cancel> button to exit this window, without retaining the current information.

Mission Constraints

Information requested. The Mission Constraints input form (Figure 55) prompts the user for seven distinct pieces of information—Installation, Species Scientific Name, Organization, Current Year, Training Mission Constraints, Non-Training Mission Constraints, and Overall Mission Constraints. The Installation list box displays a listing of installations in the database. The Species list box displays a listing of scientific names in the database. The Organization list box contains two choices, DPT or DEH. The DPT selection (Figure 56) refers to Training Mission and Non-Training Mission information, while the DEH selection (Figure 55) refers to Overall Mission information. Available responses for either selection are similar (decreased, increased, or unchanged since last year). The Current Year list box serves as a date stamp for the information. Definitions for the individual list box choices are defined in Appendix F.

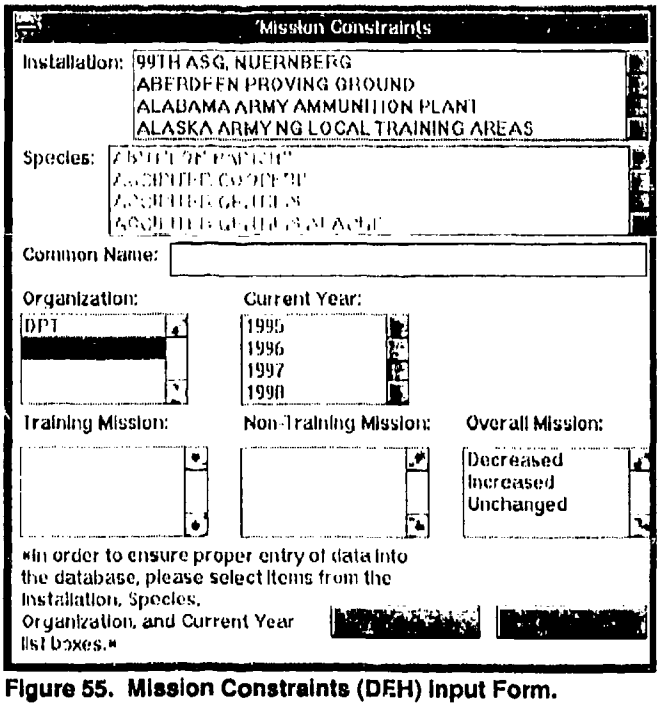


Figure 55. Mission Constraints (DEH) Input Form.

How to enter information. The Mission Constraints input form (Figure 55) can be opened through the <Data Entry> menu, by clicking on the <Mission Constraints> option (Figure 51). Selections can then be made from each list box—Installation, Species Scientific Name, Organization, Current Year, Training Mission Constraints, Non-Training Mission Constraints, and Overall Mission Constraints. Once a specific species has been selected from the Species Scientific Name list box, the common name will automatically appear in the Common Name list box. However, users should check both the scientific and common name for accuracy. If an installation or species is not available in the current list box, the user should refer to the New Information section of this chapter for adding new occurrences.

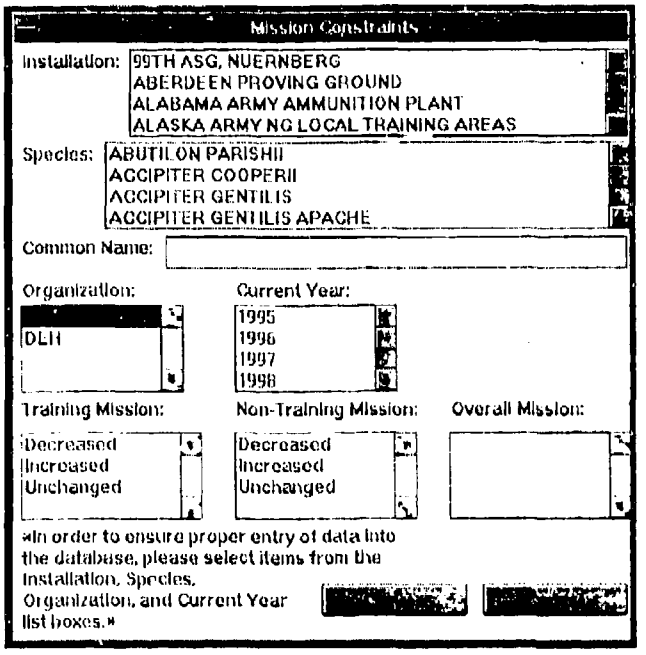


Figure 56. Mission Constraints (DPT) Input Form.

Two buttons—<Save> and <Cancel> —are available on the Mission Constraints input form. Once the necessary information has been entered, click on the <Save> button to begin committing the information to the database. This button will then prompt the Save dialog box (Figure 53), and ask for verification. If the information is correct, select <OK> to finish the commit process. If the information is not correct, or if changes need to be made, simply select the <Cancel> button on the Save dialog box. The user will then be returned to the Mission Constraints dialog box, without committing any of the new information. The user can reenter the appropriate information, or hit the <Cancel> button to exit this window, without retaining the current information.

Restricted Acres

Information requested. The Restricted Acres input form (Figure 57) prompts the user for four distinct pieces of information—Installation Name, Scientific Name, Restricted Acres, and Current Year. The Installation list box displays a listing of installations in the database. The Species list box displays a listing of scientific names in the database. The Restricted Acres list box prompts the user to enter the total restricted acreage per year. The Current Year list box serves as a date stamp

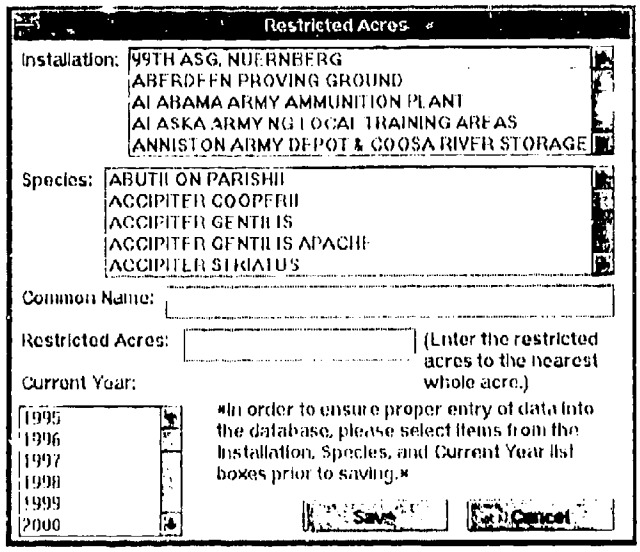


Figure 57. Restricted Acres Input Form.

for the information. Definitions for the individual list box choices are defined in Appendix F.

How to enter information. The Restricted Acres input form (Figure 57) can be opened through the <Data Entry> menu, by clicking on the <Restricted Acres> option (Figure 51). Selections can then be made from each list box—Installation Name, Scientific Name, and Current Year. Once a specific species has been selected from the Species Scientific Name list box, the common name will automatically appear in the Common Name list box. However, users should verify the species by checking both the scientific and common name. If an installation or species is not available in the current list box, the user should refer to the New Information section of this chapter for adding new occurrences. The Restricted Acres list box prompts the user to enter the total restricted acreage per year to the nearest whole acre.

Two buttons—<Save> and <Cancel>—are available on the Restricted Acres input form. Once the necessary information has been entered, click on the <Save> button to begin committing the information to the database. This button will then prompt the Save dialog box (Figure 53) and ask for verification. If the information is correct, select <OK> to finish the commit process. If the information in not correct, or if changes need to be made, simply select the <Cancel> button on the Save dialog box. The user will then be returned to the Restricted Acres dialog box, without committing any of the new information. The user can reenter the appropriate information, or hit the <Cancel> button to exit this window, without retaining the current information.

New Information

The following two sections describe the process of adding a new installation or species. If the installation or species of interest is available in the current list box, skip the following sections. In some instances, a particular installation or species within the Species Data Entry input form (Figures 52, 54, 55, 56, and 57) may not

be listed. The appropriate installation or species of interest must then be added by using the <Installation> or <Species> option under the <New Information> menu (Figure 49).

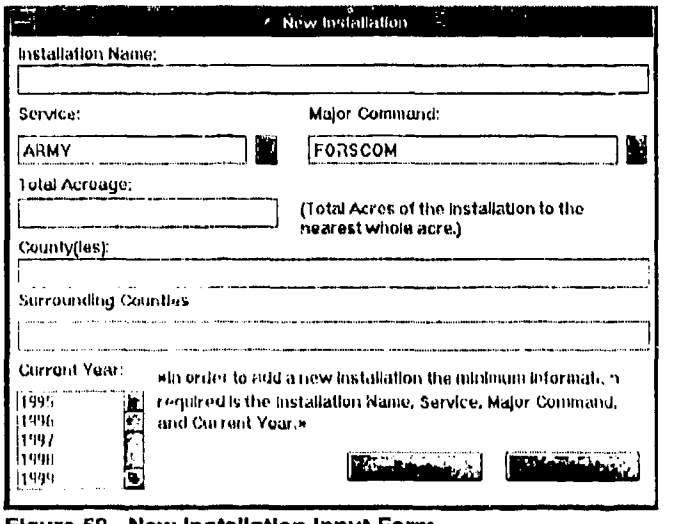


Figure 58. New Installation Input Form.

Adding a New Installation

Information requested. The New Installation dialog box (Figure 58) prompts the user for seven pieces of information: Installation Name, Service, Major Command, Total Acreage, County(ies), Surrounding County(ies), and Current Year. Both the Service and Major Command list boxes display a listing of organizations in the TES species database. The County(ies) field refers to the county(ies) in which the installation is located. The Surrounding County(ies) field refers to counties immediately adjacent to the installation county(ies). The Total Acreage field prompts the user for the total number of acres on the installation. The Current Year list box serves as a date stamp for the information.

How to enter information. Once the user has confirmed that their particular installation does not exist in the database, it should be added. Proceed by selecting the <Installation> option, under the New Information menu (Figure 49). A dialog box will prompt the user for the Installation Name, Service, Major Command, Total Acreage, County(ies), Surrounding County(ies), and Current Year. The minimum information necessary for entering a new installation is the Installation Name, Service, Major Command, and Current Year. However, enter all information if available. Installation Name, Total Acreage, County(ies), and Surrounding County(ies) fields are edit boxes, in which the user must manually enter the information by using the keyboard. To select a certain field, place the mouse cursor in the field and click once. With a blinking carat in the active field, type in the appropriate information in all capital letters. The Service, Major Command, and Current Year fields are drop down lists, where the user selects choices from an established list. However, new responses can be entered if not offered in the drop down list.

Two buttons—<Save> and <Cancel>—are available on the New Installation input form. Once the necessary information has been entered, click on the <Save> button

to begin committing the information to the database. This button will then prompt the Save dialog box (Figure 53), and ask for verification. If the information is correct, select <OK> to finish the commit process. If the information is not correct, or if changes need to be made, simply select the <Cancel> button on the Save dialog box. The user will then be returned to the New Installation dialog box, without committing any of the new information. The user can then reenter the appropriate information, or hit the <Cancel> button to exit this window, without retaining the current information.

Adding a New Species

Information requested. The New TES Species dialog box (Figure 59) prompts the user for 12 pieces of information—Kingdom, Phylum, Class, Order, Family, Genus, Species, Subspecies, Variety, Common Name, Category, and Current Year. The first 10 fields request information about the species. The Category list box displays taxonomic categories and the Current Year list box serves as a date stamp for the information.

How to enter information. Once the user has confirmed that a particular species does not currently exist in the database, it should be added. Proceed by selecting the <Species> option, under the <New Information> menu (Figure 49). A dialog box will then prompt the user for information on the Kingdom, Phylum, Class, Order, Family, Genus, Species, Subspecies, Variety, Common Name, Category and Current Year. The minimum information necessary for entering a new species includes the Genus, Species, and Current Year. However, enter all information if available. Ten of these fields—Kingdom, Phylum, Class, Order, Family, Genus, Species, Subspecies, Variety, and Common Name—are edit fields in which the keyboard must be used to enter information. To select a certain field, place the mouse cursor in the field and click once. With a blinking carat in the active field, type in the appropriate information in all capital letters. The last two fields, Category and Current Year, are list boxes that users can select from.

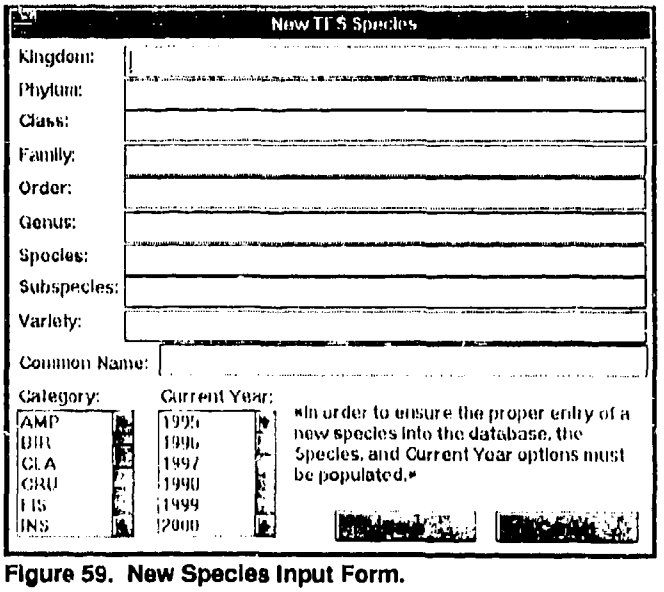


Figure 59. New Species Input Form.

Two buttons—<Save> and <Cancel>—are available on the New

Two buttons—<Save> and <Cancel>—are available on the New Species input form. Once the necessary information has been entered, click on the <Save> button to begin committing the information to the database. This button will then prompt the Save dialog box (Figure 53) and ask for verification. If the information is correct, select <OK> to finish the commit process. If the information is not correct, or if changes need to be made, simply select the <Cancel> button on the Save dialog box. The user will then be returned to the New Species dialog box, without committing any of the new information. The user can then reenter the appropriate information, or hit the <Cancel> button to exit this window, without retaining the current information.

Help Menu - About Box

The About Box (Figure 60) provides information similar to that given in the introduction dialog box (Figure 3), except for names of developers and contributors. This dialog box can be accessed through the <Help> selection of the main menu by clicking on the <About...> option. Proceed by clicking on the <OK> button, located in the lower righthand corner.

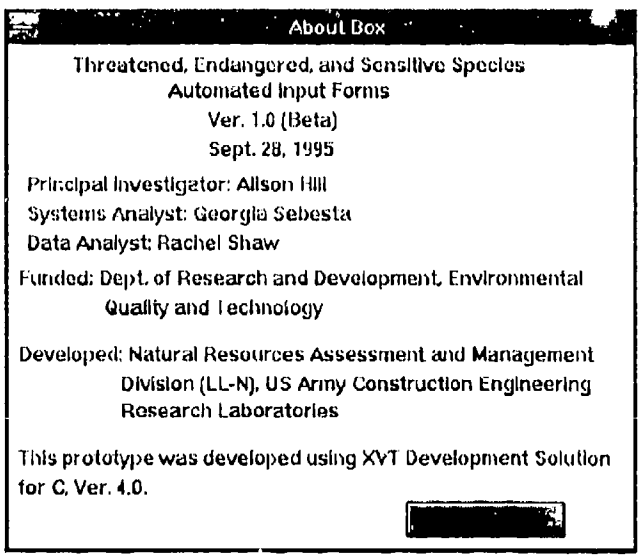


Figure 60. About Box for Automated Input Forms.

7 Database

This chapter discusses information about the centralized database that is distributed and used by the TRACKER component of TESSAIMS. The information that follows is written primarily for database managers, programmers, and system analysts. Information can be divided into five distinct topic areas, two of which include Source and Limitations. Source includes where the information came from and the type of information obtained. Limitations address the availability, validity, and accuracy of the information. The database, on the other hand, is divided into three topic areas: (1) how the database is organized, (2) descriptions of the database elements, and (3) data definitions. Future information needs for the military and TES species will also be addressed.

Data Source

In the summer of 1992, a survey was sent to over 170 Army installations, covering a broad spectrum of topic areas. From survey responses, over 750 TES and other related species were entered into a TES species database. Information entered into the database came directly from military installations, including the environmental office, military trainers, and the JAG office. The initial survey covered a much broader spectrum of topic areas than is currently included in the TRACKER tool. Additional topic areas included legal issues, general knowledge management techniques, inventory, and monitoring.

Data and Database Limitations

Information in the database does have limitations. First, since the data is considered current as of July 1992, much of the information is already outdated. In addition, obtaining, compiling, and verifying information is also

very time consuming and costly. Second, the information is limited in scope to the previously mentioned topic areas: <Species Occurrence>, <Funding>, <Restrictions/Constraints>, and <Installation Info>. These topic areas were prioritized and deemed most important from the original survey. However, the knowledge base varies greatly between installations depending on funding and staff turnover. Therefore, the consistency of information is directly impacted. Lastly, with over 170 installations and 750 TES species currently in the database, many problems exist. The amount of information is enormous and the effort to manage this information is already overwhelming. These problems will increase as additional installations and species are added to the database.

Database Organization

Key decisions were made early in the database development process. First, the database needed to be relational, to allow database managers to store the maximum amount of information with minimal duplication. Relational databases consist of a series of tables, with many records, that are linked by primary keys or unique identifiers. Queries use these primary keys to access multiple tables, whereas unique identifiers are used primarily for data management purposes but may appear in some output summaries. Primary keys within TRACKER's database tables are the species name codes (SPPCODE) and the installation name codes (INCODE). The SPPCODE for plants and animals consists of the first two letters of genus and the first two letters of the specific epithet (e.g., AICA for *Aimophila carpalis* [Rufous-winged sparrow]). If duplicate codes exist, ascending numbers, starting with 1, are added to the end of the SPPCODE (e.g., AICA1 for *Aimophila cassinii* [Cassin's sparrow]). The INCODE consists of the first three letters of the installation proper name (e.g., HOO for Fort Hood). If duplicate codes exist, the next unique letter to the immediate right of the installation's proper name should be used until a unique identifier is found.

A second key point was that of organizing the information in the database. Organization can greatly speed up access time for TRACKER by reducing the number of tables being accessed during the retrieval process. The entire TES species database (Appendix A) contains three distinct sets of information, linked by primary keys, that support each of the 'TESSAIMS'

applications. Most table names begin with a unique letter that identifies the type of information within the table. For example, S_ labels are used for species-specific information tables supporting SSBI; E_ labels are for tables supporting BioTES; and T_ labels are for installation-specific information tables supporting TRACKER. TAXONOMY and some of the other database management tables are the only tables that do not use this naming convention. TAXONOMY contains a general taxonomic breakdown for species used by TRACKER and SSBI. Individual tables and fields are further defined in the **Database Tables and Column Names**, and **Future Information Needs** sections of this chapter.

Database Tables and Column Names

The TRACKER tool uses 11 tables from the TES species database for the Query and Summary component (Appendix E). Seven T_ tables contain installation-specific information, T_DEH_MISS_C, T_DPT_MIS_C, T_FUNDING, T_INST_CONT, T_INST_INFO, T_RES_ACRES, and T_SPP_OCCUR. The TAXONOMY table contains taxonomic information on all TES species within the entire database. The remaining three tables, N_TRAIN_MISS, O_MISSION_TR, and TRAIN_M_TR, are information management tables used for programming. Fields not currently populated are italicized.

Data Definitions

The TRACKER tool uses six tables in a temporary database for the Automated Input Forms component (Appendix F). Information requested includes New Installations, New TES Species, Species Occurrence, Funding, Mission Constraints, and Restricted Acres. Definitions for each general topic area, data field definitions, and valid responses are also presented in Appendix F.

Future Information Needs

Information currently in the database is minimal when describing baseline conditions of TES species Army-wide. Therefore, future work should concentrate on: (1) improving information quality, (2) continuing to define and refine user needs, (3) validating installation responses, and (4) expanding the scope of the information.

8 Application Development

Developers searched for tools to meet government standards that were readily available, and satisfied the users' needs. Government standards currently require the use of database engines that recognize the SQL and operate in the UNIX and MS-DOS operating systems. Developers also wanted tools that would be compatible with application developments already underway. In the initial search for available off-the-shelf development tools, these standards helped guide decisions. The rapid development tool selected, XVT Development Solution for C by XVT Software, Inc., provided opportunities for the development of multiple operating systems and platforms and the ability to output the program code in C language. C language makes it easy for developers to add customized codes for compatibility with other applications. Development of TESSAIMS took place in the MS-DOS operating system on the Window GUI, and can be easily recompiled for UNIX systems. To eventually reach a variety of database engines, open database connectivity (ODBC) compliance was used. All initial development was done using SQLBase by Gupta Technologies, Inc. SQLBase is fairly easy to use, cost effective, and one of the initial databases developed for Windows. Further system requirements are listed in Chapter 3 under **System Requirements** and **Software Requirements**.

References

Boice, L.P.and J. Kaiser, "DOD's Conservation Program: Supporting the Military Mission Wile Protecting a Wealth of National Resources," *22nd Environmental Symposium and Exhibition* (American Defense Preparedness Association, March 1996, pp 489-494).

Sebesta, G., *Overview of Development on the Threatened, Endangered, and Sensitive (TES) Species Automated Information Management System (TESSAIMS)* (Dept. of Natural Resources and Environmental Sciences, University of Illinois, 1995).

Sebesta, G., and A. Hill, *User's Manual for Biodiversity and Threatened and Endangered Species Expert (BioTES) Tool Version 1.0*, ADP Report 97/21 (USACERL, November 1996).

Sebesta, G., and A. Hill, *User's Manual for Species-Specific Biological Information (SSBI) Tool Version 1.0*, ADP Report 97/20 (USACERL, November 1996).

Appendix A: TES Automated Information Management System Database Schematic

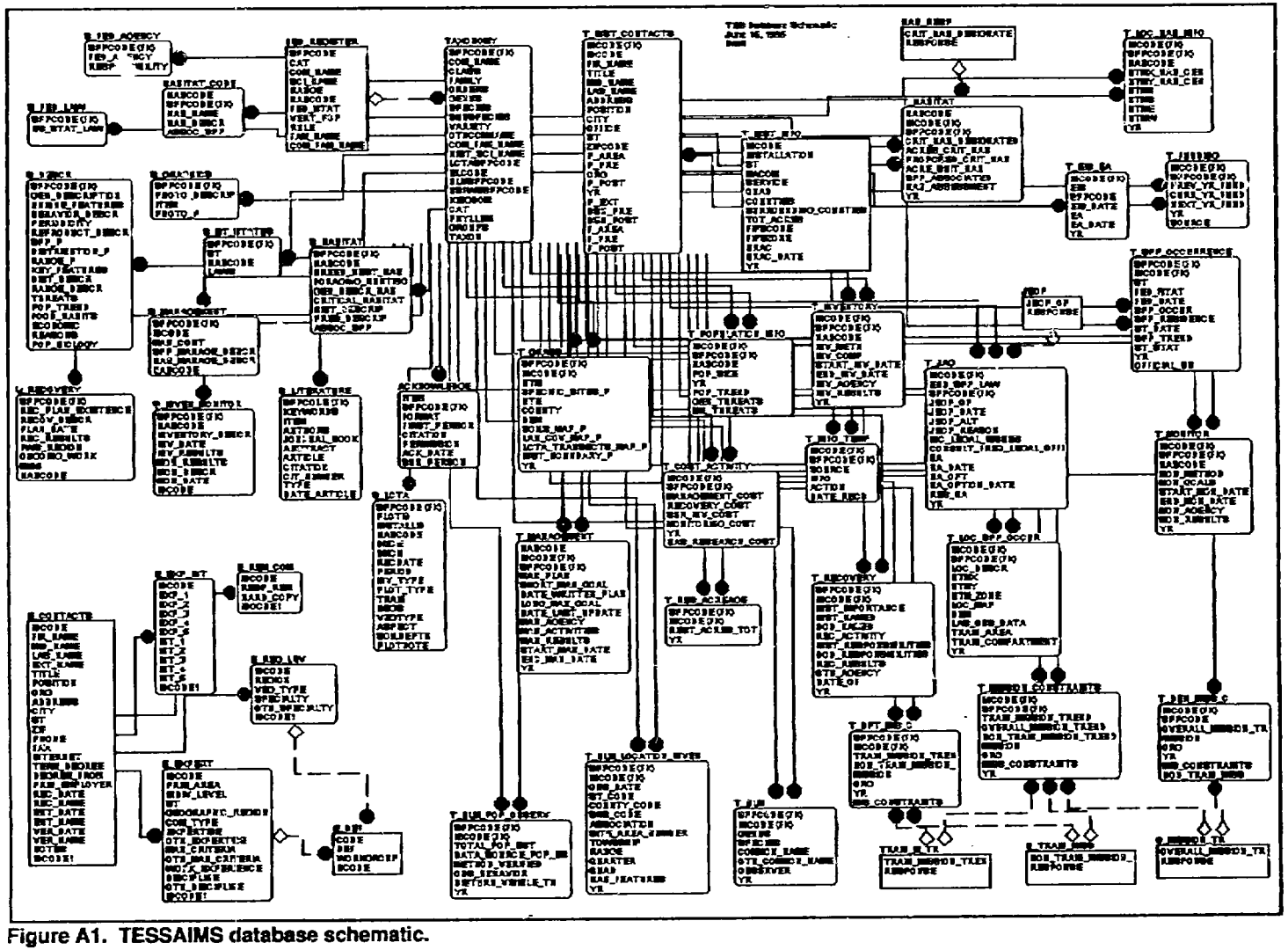


Figure A1. TESSAIMS database schematic.

Appendix B: Flow Diagrams for Menu and Queries

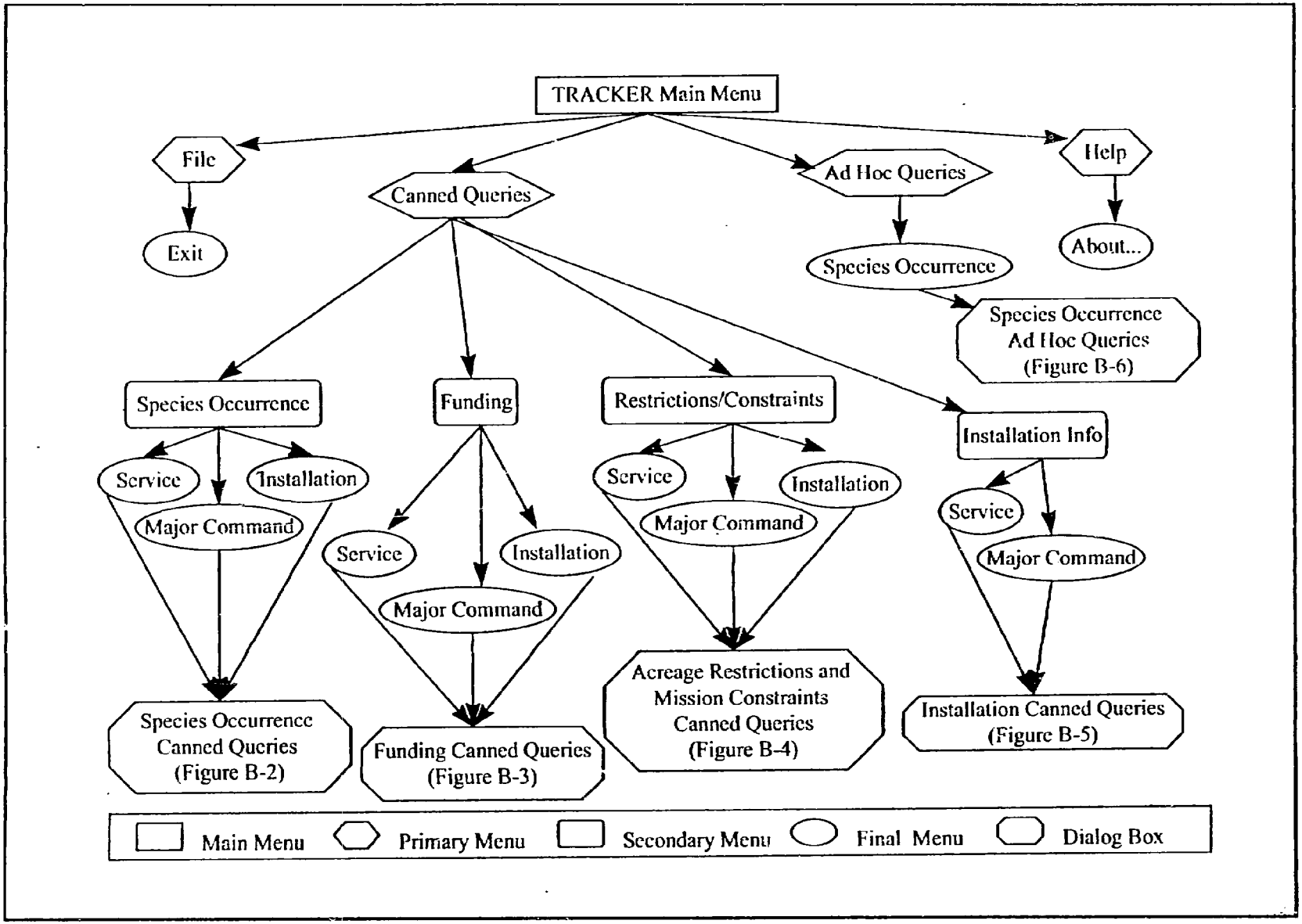


Figure B1. Flow diagram for Main Menu for TRACKER application.

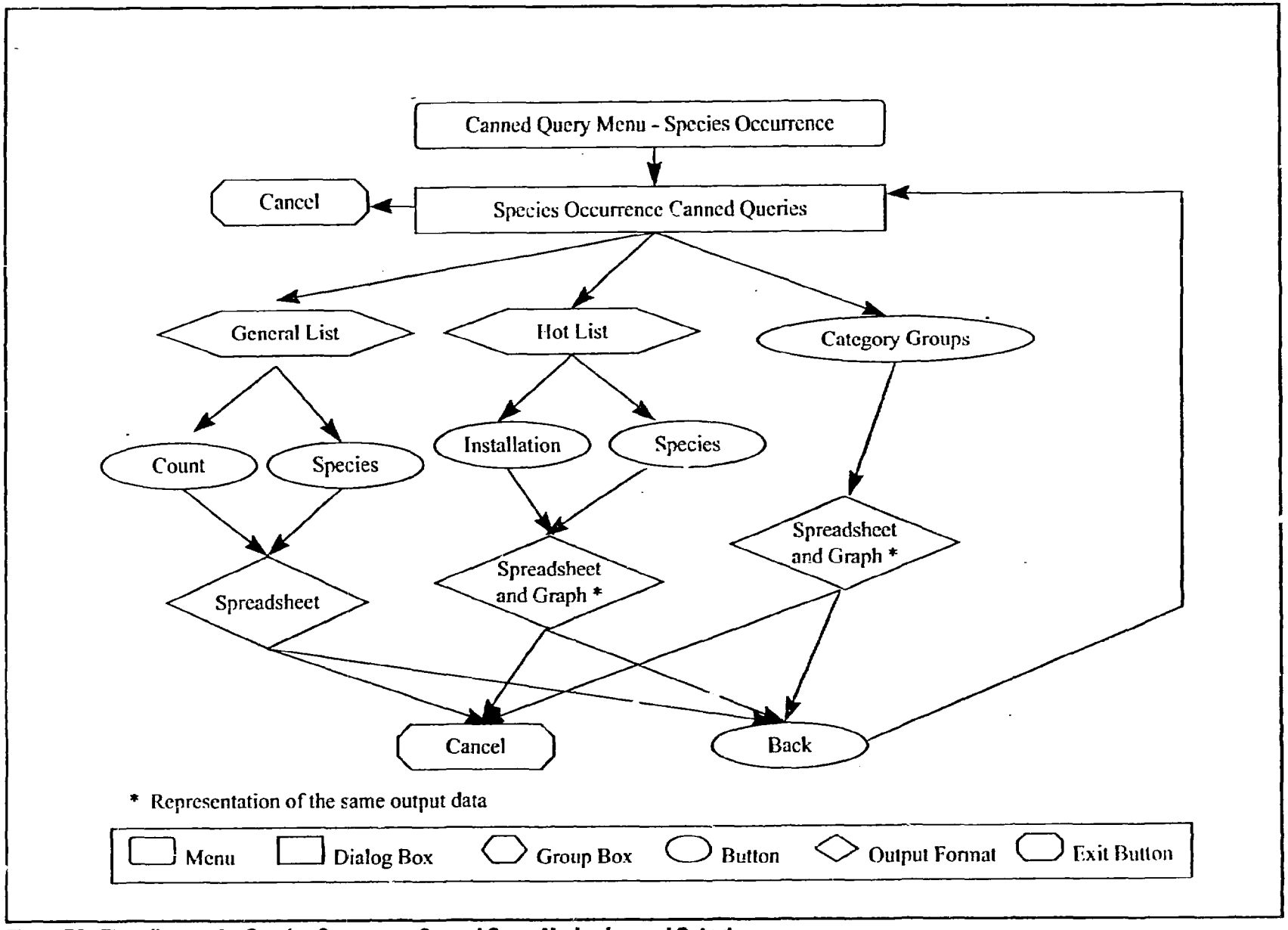


Figure B2. Flow diagram for Species Occurrence Canned Query Mechanism and Output.

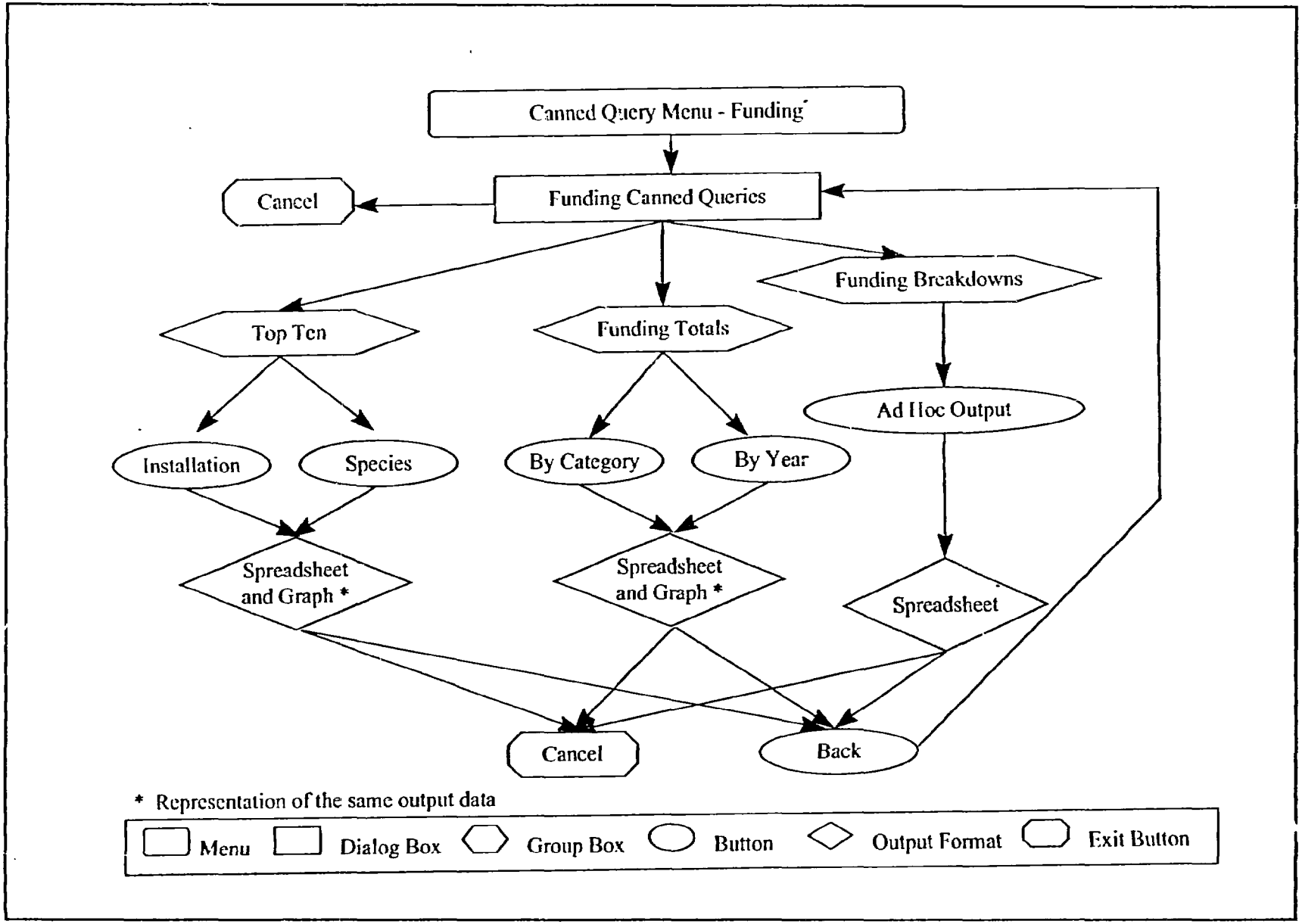


Figure B3. Flow diagram for Funding Canned Query Mechanism and Output.

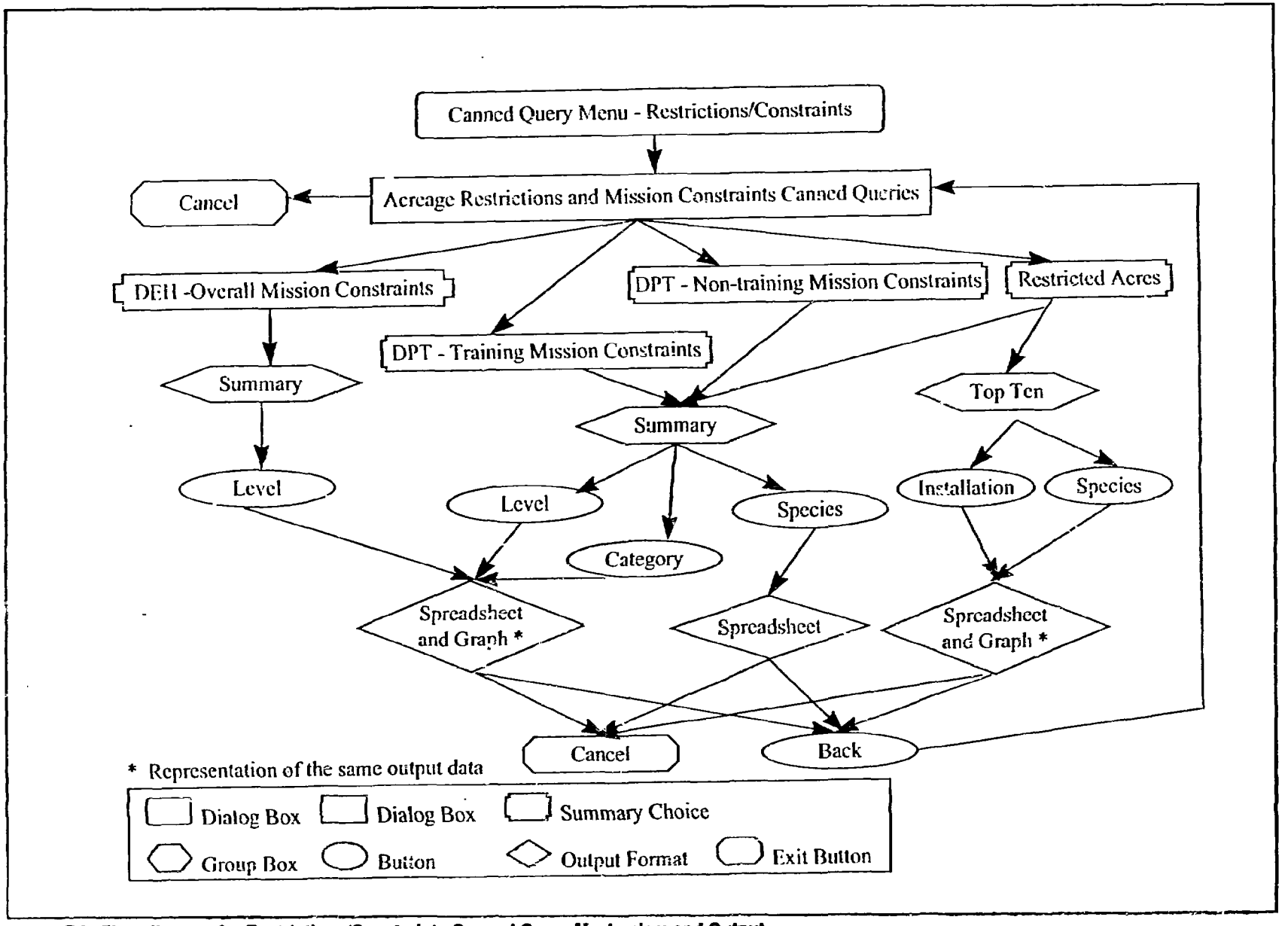


Figure B4. Flow diagram for Restrictions/Constraints Canned Query Mechanism and Output.

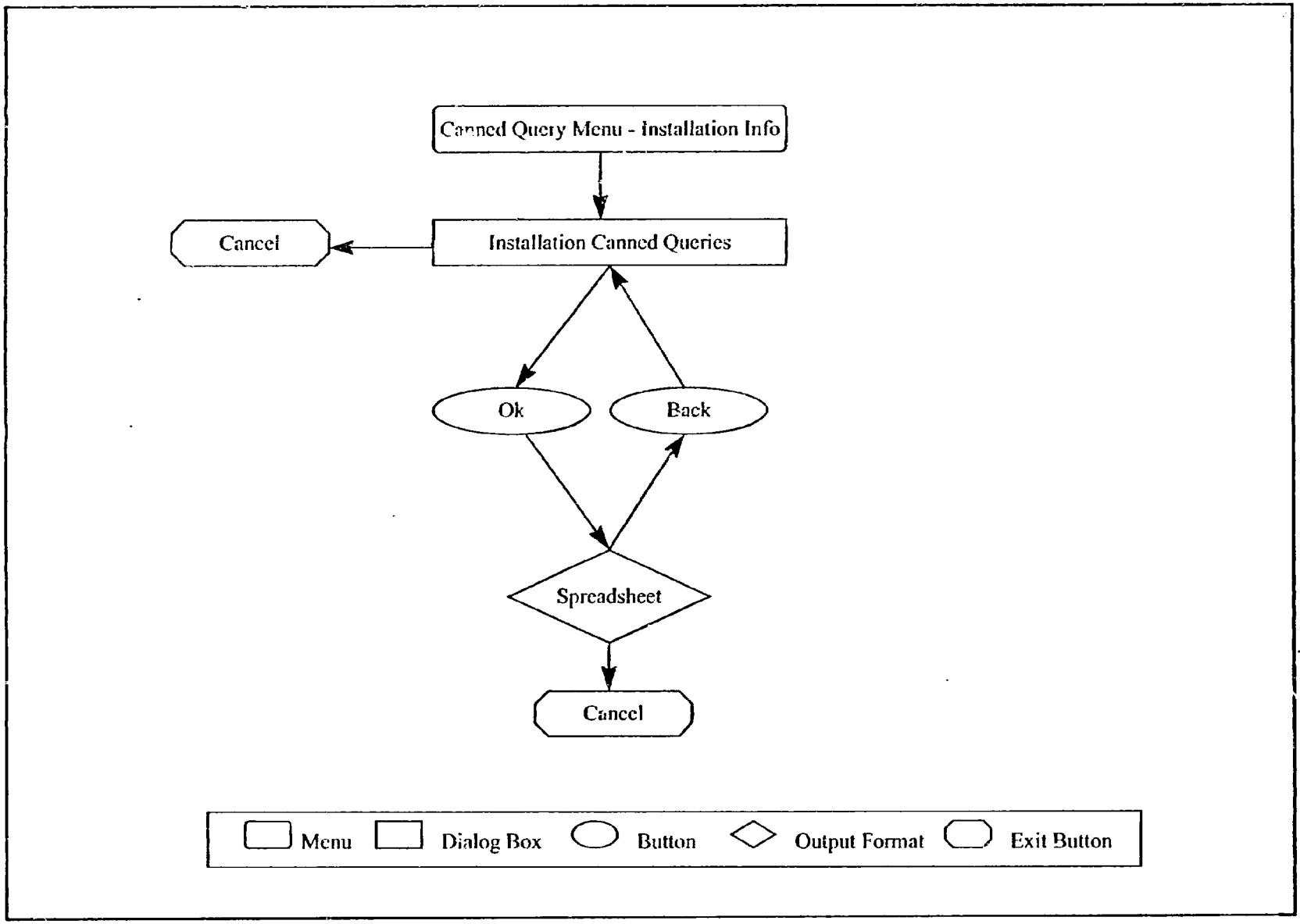


Figure B5. Flow diagram for Installation Info Canned Query Mechanism and Output.

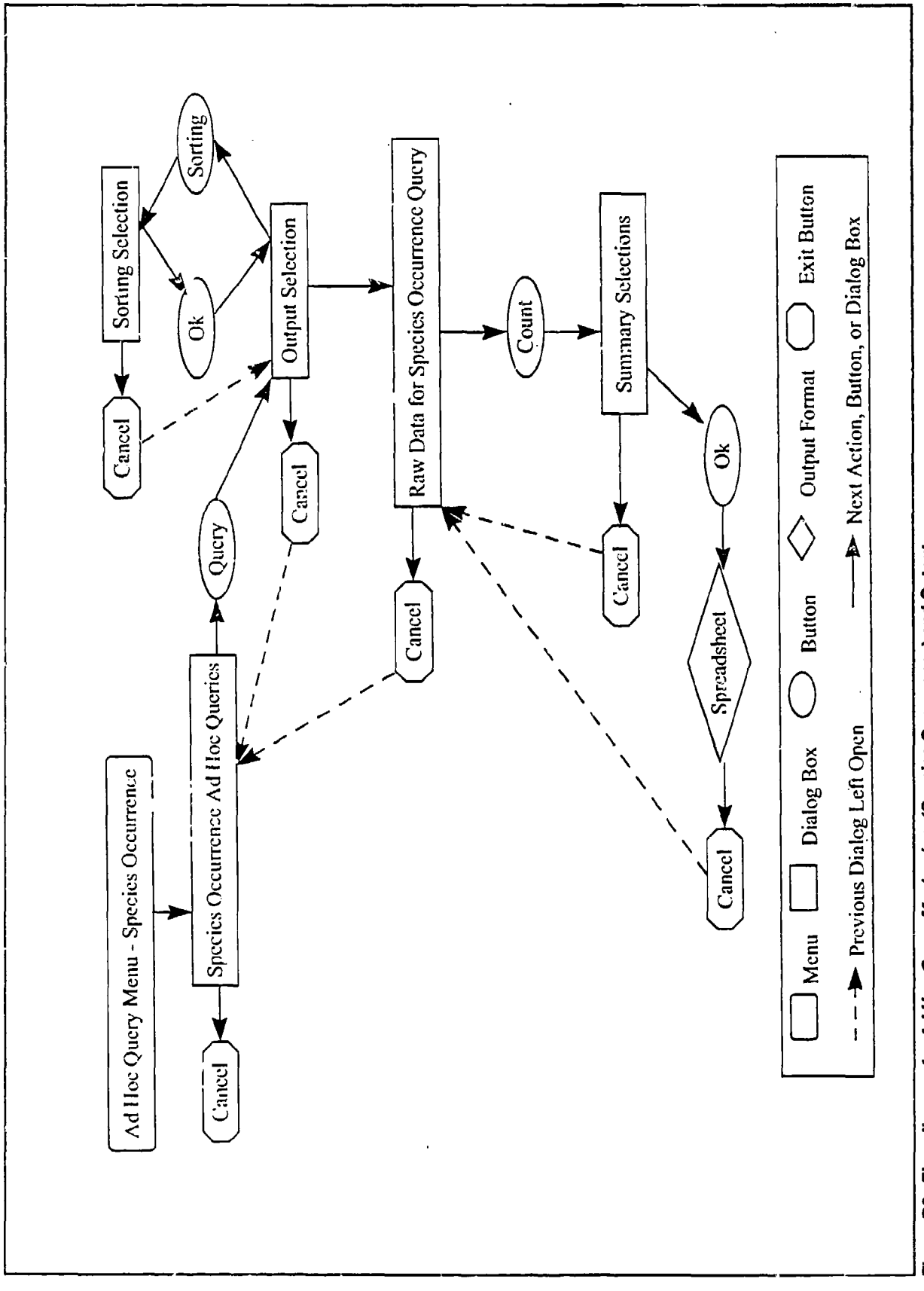


Figure B3. Flow diagram for Ad Hoc Query Mechanism (Species Occurrence) and Output.

Appendix C: TRACKER's Canned Query Component Inputs and Outputs

Topic Area	Summary Button	Inputs (List Box Parameters)	Output Format	General Question
Species Occurrence	General List <Count>	Level of Interest, Federal Status, Year	Spreadsheet	How many distinct TES species occur on distinct installation?
Species Occurrence	General List <Species>	Level of Interest, Federal Status, Year	Spreadsheet	Which TES species occur on which installations?
Species Occurrence	Hot List <Installation>	Level of Interest, Federal Status, Year	Spreadsheet and Graph	What are the top ten installations with the most TES species?
Species Occurrence	Hot List <Species>	Level of Interest, Federal Status, Year	Spreadsheet and Graph	What are the top ten TES species occurring on the most installations?
Species Occurrence	<Category Groups>	Level of Interest, Federal Status, Year	Spreadsheet and Graph	What is the breakdown of TES species on installations grouped by category?
Funding	Top Ten <Installation>	Level of Interest, Federal Status, Year	Spreadsheet and Graph	What are the top ten installations with TES species with the most funding?
Funding	Top Ten <Species>	Level of Interest, Federal Status, Year	Spreadsheet and Graph	What are the top ten TES species occurring on installations with the most funding?
Funding	Funding Totals <By Category>	Level of Interest, Federal Status, Year	Spreadsheet and Graph	What is the funding breakdown for TES species occurring on installations group by category?
Funding	Funding Totals <By Year>	Level of Interest, Federal Status, Year	Spreadsheet and Graph	What is the funding breakdown for TES species occurring on installations group by year?
Funding	Funding Breakdown <Ad Hoc Output>	Level of Interest, Federal Status, Year, Outputs for Breakdowns, Funding Year Breakdowns, Sorting Selection, Breakdown Sorting	Spreadsheet	This function provides answers to a variety of questions as designed by the user.
Restricted Acres	Top Ten <Installation>	Level of Interest, Federal Status, Year	Spreadsheet and Graph	What are the top ten installations with the most restricted acres caused by TES species?
Restricted Acres	Top Ten <Species>	Level of Interest, Federal Status, Year	Spreadsheet and Graph	What are the top ten TES species causing the most restricted acres on installations?
Restricted Acres	Summary <Level>	Level of Interest, Federal Status, Year	Spreadsheet	How many acres are restricted on installations by TES species?
Restricted Acres	Summary <Species>	Level of Interest, Federal Status, Year	Spreadsheet	How many acres are restricted by distinct TES species on installations?
Restricted Acres	Summary <Category>	Level of Interest, Federal Status, Year	Spreadsheet and Graph	How many acres are restricted on installations by TES species grouped by category?
DEH - Overall Mission Constraint	Summary <Level>	Level of Interest, Year	Spreadsheet and Graph	What is the trend in overall mission constraints by all TES species according to the DEH on installations?
DPT - Training Mission Constraints	Summary <Level>	Level of Interest, Federal Status, Year	Spreadsheet and Graph	What is the trend in training mission constraints by all TES species according to the DPT on installations?
DPT - Training Mission Constraints	Summary <Species>	Level of Interest, Federal Status, Year	Spreadsheet	What is the trend in training mission constraints by distinct TES species according to the DPT on installations?
DPT - Training Mission Constraints	Summary <Category>	Level of Interest, Federal Status, Year	Spreadsheet and Graph	What is the trend in training mission constraints by all TES species according to the DPT on installations grouped by category?
DPT - Non-training Mission Constraints	Summary <Level>	Level of Interest, Federal Status, Year	Spreadsheet and Graph	What is the trend in non-training mission constraints by all TES species according to the DPT on installations?
DPT - Non-training Mission Constraints	Summary <Species>	Level of Interest, Federal Status, Year	Spreadsheet	What is the trend in non-training mission constraints by distinct TES species according to the DPT on installations?
DPT - Non-training Mission Constraints	Summary <Category>	Level of Interest, Federal Status, Year	Spreadsheet and Graph	What is the trend in non-training mission constraints by all TES species according to the DPT on installations grouped by category?
Installation Info	<Ok>	Available Installation, Available Information	Spreadsheet	Answers general information need on installations, including installation name, service, major command, state, county(ies), or total acreage.

Figure C1. Inputs and outputs for buttons and dialog boxes in TRACKER's Canned Query Component.

Appendix D: Logic Definition for TRACKER's Ad Hoc Query Component

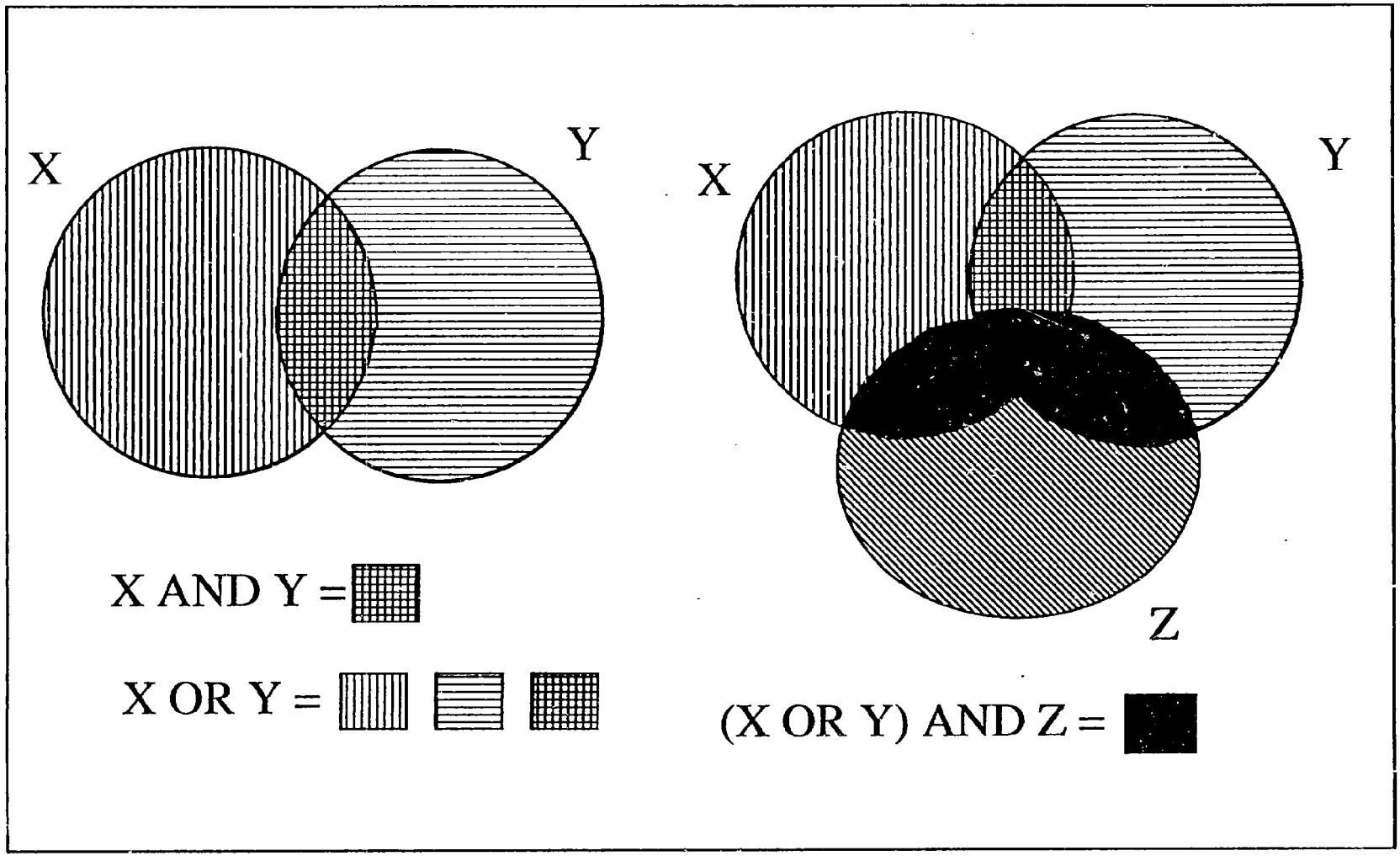


Figure D1. VENN diagrams for logic used in "Where Clause" development.

Appendix E: Table and Data Definitions for the Query and Summary Component of TRACKER

N_TRAIN_MISS	Code values for Non-training Mission Trend - administrative use only
NON_TRAIN_MISS	Effect of element on non-training mission - code values
RESPONSE	Code definitions
O_MISSION_TR	Code values for Overall Mission Trend - administrative use only
OVERALL_MISSION_TR	Effect of element on overall mission - code values
RESPONSE	Code definitions
TAXONOMY	Complete taxonomic description for each species, from kingdom down to subspecies or variety level
SPPCODE	Species code for the element
ELCODE	*Element code (BCD)*
COM_NAME	Common name for the element
KINGDOM	Kingdom of the element
PHYLUM	Phylum of the element
TAXON	Describer of taxon, year described, narrative on any taxonomic dispute
GROUP	Group of the element
CLASS	Class of the element
ORDER	Order of the element
FAMILY	Family of the element
GENUS	Genus of the element
SPECIES	Species of the element
SUBSPECIES	Subspecies of the element
VARIETY	Variety of the element
OTHCOMNAME	*Other common names for the element*
COM_FAM_NAME	Other common family names for the element
HIST_SCI_NAME	*Historical scientific names for the element*
LCTASPPCODE	*LCTA code for the element*
BLMSPPCODE	*BLM code for the element*
USFWSSPPCODE	*USFWS code for the element*
CAT	Generic category for the element

T_DEH_MISS_C	Change in constraints on DEH training mission, non-training mission, and overall mission due to presence of particular species on an installation
SPPCODE	Code for the element
INCODE	Code for the installation
OVERALL_MISSION_TR	Change in overall mission constraints due to elements
MISSION	*Description of the mission*
ORG	Organization of the point of contact (POC)
YR	Current year when the mission constraint information was entered
MIS_CONSTRAINTS	*Constraints on the mission due to the element*
NON_TRAIN_MISS	*Constraints on the non-training mission due to the element*
T_DPT_MIS_C	Change in constraints on DPT training mission, non-training mission, and overall mission due to presence of particular species on an installation
INCODE	Code for the installation
SPPCODE	Code for the element
TRAIN_MISSION_TREND	*Change in training mission constraints due to elements*
MISSION	*Description of the mission*
ORG	Organization of the point of contact (POC)
YR	Current year when the mission constraint information was entered
MIS_CONSTRAINTS	Constraints on the mission due to the element
NON_TRAIN_MISS	Constraints on the non-training mission due to the element
T_FUNDING	Funding information for individual species on installations
SPPCODE	Code for element
INCODE	Code for the installation
YR	Current year when the information was entered
PREV_YR_FUND	Previous years funding
CURR_YR_FUND	Current year funding
NEXT_YR_FUND	Following years funding
SOURCE	*Funding source(s)*
T_INST_CONT	Information on point of contact for each installation
INCODE	Code for the installation
IDCODE	Code for the point of contact (POC) person
FIR_NAME	First name of the point of contact (POC) for the installation
MID_NAME	Middle name of the point of contact (POC) for the installation
LAS_NAME	Last name of the point of contact (POC) for the installation
TITLE	Title of the point of contact (POC)
POSITION	Position of the point of contact (POC)
OFFICE	Office of the point of contact (POC)
YR	Year information was entered
ADDRESS	Address of the point of contact (POC)
CITY	City of the point of contact (POC)
ST	State of the point of contact (POC)
ZIPCODE	Zipcode of the point of contact (POC)
ORG	Organization of the point of contact (POC)
P_AREA	Phone area code of the point of contact (POC)

P_PRE	Phone prefix of the point of contact (POC)
P_POST	Phone post-fix
P_EXT	Phone extension
F_AREA	FAX area code
F_PRE	FAX prefix
F_POST	FAX post-fix
DSN_PRE	DSN prefix
DSN_POST	DSN post-fix

T_INST_INFO Information about each installation

INCODE	Code for the installation
INSTALLATION	Installation name
ST	State of the installation
MACOM	Major command of the installation
SERVICE	Military branch of the installation
QUAD	*USGS quadrant*
COUNTIES	Counties in which the installation resides
SURROUNDING_COUNTIES	Counties surrounding the installation
TOT_ACRES	Total acres of the installation
FIPSZONE	*FIPS zone code*
FIPSCODE	*FIPS county code(s)*
BRAC	*Base restructuring and closing*
BRAC_DATE	*Base restructuring and closing date*
YR	Year information was provided

T_RES_ACRES Total restricted acres for (named) species on (named) installation

SPPCODE	Code for element
INCODE	Code for the installation
REST_ACRES_TOT	Total restricted acres due to element or habitat
YR	Year information was provided

T_SPP_OCCUR Information on known or potential existence of (named) species on (named) installation

SPPCODE	Code for element
INCODE	Code for the installation
ST	States where the installation resides
FED_STAT	Federal status of the species
FED_DATE	Date of the Federal Register listing from which the information was taken
SPP_OCCUR	Known or potential element occurrence on installation
SPP_RESIDENCE	Periodicity of residency for element on installation
SPP_TREND	*General trend of the element's existence on the installation*
YR	Year information was provided
ST_DATE	Date of most recent document received on state statuses from that state
ST_STAT	State status of the element
OFFICIAL_UN	Whether listing is official (covered by state law) or unofficial

TRAIN_M_TR

TRAIN_MISSION_TREND	Codes for training mission trend
RESPONSE	Definition of training mission trend codes

Appendix F: Table and Data Definitions for the Automated Input Forms Component of TRACKER

NEW INSTALLATION	Enter a new installation into the database and assign a temporary INCODE	
	INSTALLATION NAME	Full name of the installation in upper case
	SERVICE	Army, Navy, AFB, NGB, Marine, etc.
	MAJOR COMMAND	FORSCOM, TRADOC, etc.
	TOTAL ACREAGE	Total acreage for the installation to the nearest whole acre
	COUNTY(IES)	List of counties where the installation resides in upper case
	SURROUNDING COUNTIES	List of counties surrounding the installation in upper case
	CURRENT YEAR	Date stamp for information in the database
NEW TES SPECIES	Enter a new element into the database and assign a temporary SPPCODE	
	KINGDOM	Kingdom for the element in upper case
	PHYLUM	Phylum for the element in upper case
	CLASS	Class for the element in upper case
	ORDER	Order for the element in upper case
	FAMILY	Family for the element in upper case
	GENUS	Genus for the element in upper case
	SPECIES	Species for the element in upper case
	SUBSPECIES	Subspecies for the element in upper case
	VARIETY	Variety for the element in upper case
	COMMON NAME	Common Name for the element in upper case
	CATEGORY	Taxonomic category for the element
	CURRENT YEAR	Date stamp for information in the database
SPECIES OCCURRENCE	Information on known or potential existence of (named) species on (named) installation	
	INSTALLATION	List of (named) installation from database
	SPECIES	List of (named) species from database
	COMMON NAME	Common name populated from the database and the SPECIES list box
	CURRENT YEAR	Date stamp for information in the database
	SPECIES OCCURRENCE	Known or suspected occurrence of (named) species
	TYPE OF OCCURRENCE	Permanent, seasonal, or visitor of (named) species
FUNDING	Funding information for individual species on installations	
	INSTALLATION	List of (named) installation from database

SPECIES	List of (named) species from database
COMMON NAME	Common name populated from the database and the SPECIES list box
PREVIOUS YEAR'S FUNDING	Funding (nearest whole dollar) for previous year to CURRENT YEAR
CURRENT YEAR'S FUNDING	Funding (nearest whole dollar) for CURRENT YEAR entry
NEXT YEAR'S FUNDING	Funding (nearest whole dollar) for year following CURRENT YEAR
CURRENT YEAR	Date stamp for information in the database

MISSION CONSTRAINTS Mission Constraints on a (named) installation by a (named) species as reported by the environmental office or the trainers

INSTALLATION	List of (named) installation from database
SPECIES	List of (named) species from database
COMMON NAME	Common name populated from the database and the SPECIES list box
ORGANIZATION	DPT or DEH selection
CURRENT YEAR	Date stamp for information in the database
TRAINING MISSION	Increased, decreased, or unchanged selection for trend
NON-TRAINING MISSION	Increased, decreased, or unchanged selection for trend
OVERALL MISSION	Increased, decreased, or unchanged selection for trend

RESTRICTED ACRES Total restricted acres for (named) species on (named) installation

INSTALLATION	List of (named) installation from database
SPECIES	List of (named) species from database
COMMON NAME	Common name populated from the database and the SPECIES list box
RESTRICTED ACRES	Restricted acreage due to (named) species to nearest whole acre
CURRENT YEAR	Date stamp for information in the database

DISTRIBUTION

Chief of Engineers
ATTN: CEHEC-IM-LH (2)
ATTN: CEHEC-IM-LP (2)
ATTN: CECC-R
ATTN: CERD-L
ATTN: CERD-M

HQ, TRADOC
ATTN: ATBO-SE
Fort Monroe, VA 23641-5000

HQ, FORSCOM
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Fort Gordon, GA 30905-5040

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Installation & Services Activity
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Natural Resources Management Office
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U.S. Army Environmental Center
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Aberdeen Proving Ground, MD
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US Army TEC
Humphrey's Engineering Center
Alexandria, VA 22310-5000

HQ, USARPAC
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Fort Shafter, HI 96858-5100

Michigan Army National Guard
Lansing, MI 98913

Department of Army
Environmental Programs Directorate
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Arlington, VA 22204-1382

HQDA
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Washington DC 20310-0400

USAEWES
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Vicksburg, MS 39180-6199

HQDA, ACSIM
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Washington DC 20310-0600

HQ, U.S. Army Reserve Command
ATTN: AFAC-ENV-RC
Atlanta, GA 30331-5099

US Army Training Support Center
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