



Recommended Naming Standards for Inventory and Monitoring Databases

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Abstract:

This document presents the recommended database object naming standards for Natural Resource Inventory and Monitoring Program (I&M) databases developed in Microsoft Access. The recommendations were developed to promote standardization for the purposes of data interchange and are presented as 15 “rules”. They are expected to be used in Access applications that are likely to integrate with other I&M databases and information management systems. Natural Resource Database Template (NRDT) database applications in particular should conform to these recommendations.

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Introduction

The following database object naming guidelines were originally developed by Simon Kingston (WASO-I&M) and Angie Southwold (AKRO) after the 2002 NPS I&M Data Manager's meeting to support the development of I&M MS Access database applications in general. The recommendations were distributed for comment and review in October of 2002, revised with input from data managers by Chris Dietrich (WASO-I&M) in June 2004, and distributed to data managers again for a four-week review in January of 2005. These guidelines constitute the recommended object naming guidelines for Natural Resource Database Template (NRDT) database applications (<http://science.nature.nps.gov/im/apps/template/index.htm>). While it is difficult to find consensus among application developers on every recommendation of any particular naming convention, most developers would agree that adopting a convention and applying it consistently are important for data interchange and application maintenance and support. Because many NRDT applications are designed for long-term (more than 5 years) use, I&M strongly recommends that NPS staff, contractors and partners, follow the naming standards outlined in this document to facilitate application support and data interchange and integration.

Rules

Rule 1: Prefix table names

Recommended Implementation
<p>Prefix each table with the appropriate category abbreviation.</p> <ul style="list-style-type: none">• There are three categories of tables. A data table is most common and contains data collected in the field. A lookup table contains a list of valid values that references some other field in the database. A cross-reference (or linking) table is the table created to accurately depict a many-to-many relationship; this table references the two parent tables and contains their primary keys.• To help distinguish a table type, prefix the table name with one of the following:• Data Table = tbl_• Lookup Table = tlu_• Cross-reference table = xref_
<p>Examples of Recommended Design</p> <p>tbl_Locations tbl_Events tlu_Parks tlu_Observers xref_Location_Event xref_Event_Bird_Observation</p>

Rule 2: Prefix objects

Recommended Implementation

Prefix each database object with the appropriate abbreviation.

The following list contains some recommended prefixes for other database objects:

- Form
 - Main Form = frm_
 - Query (for criteria) = fqry_
 - List (read-only grid) = flst_
 - Edit (for data entry) = fedt_
 - Sub Form = fsub_
- Query
 - Select = qry_
 - Insert = qins_
 - Update = qupd_
 - Delete = qdel_
 - Append = qapp_
 - Make-Table = qmak_
 - Cross-Tab = qxtb_
- Report
 - Main Report = rpt_
 - Sub Report = rsub_
- Macro = mac_
- Module = mod_
- Index = idx_

Rule 3: Avoid spaces

Recommended Implementation	
<p>Do not use spaces within a file, table or field name.</p> <p>Many users include spaces in file, table and field names for easy readability. Instead, use an underscore between words (see Separate words rule – Rule 4).</p> <p>Access is one of the only databases to even allow the use of spaces within names, so other databases, development tools, and analysis tools often have difficulty using these fields without custom workarounds added by the programmer or user.</p>	
Examples of Design	Examples of Better/Recommended Design
Location ID Park Code Project Code	Location_ID Park_Code Project_Code

Rule 4: Separate words

Recommended Implementation	
<p>Use underscores to separate words within a single table or field name.</p> <p>Many users rely on mixed case table and field names for easy readability. Rather than relying upon the way the name is typed, a better choice is to separate words with an underscore (_). The name then resembles written text and words within the name are easily identified.</p> <p>Many analysis tools ignore case. When data is imported from a database, the tool converts field names to all upper or all lower case. By using underscores to separate words, the fields maintain readability.</p> <p>However, keep in mind that some databases are case-sensitive. This means that any user must type the names exactly as they have been created to get the expected results.</p>	
Examples of Design	Examples of Better/Recommended Design
EventID StartDate EndDate AlphaCD	Event_ID Start_Date End_Date Alpha_CD

Rule 5: Specific names

Recommended Implementation	
Choose a name that accurately identifies the data to be stored in a table or field. Strive to create names that accurately define the data stored within. If a name is too vague, users must rely upon supplemental documentation for definitions. Also, users may enter data that the field was not intended to store.	
Examples of Design	Examples of Better/Recommended Design
Habitat Percent_Cover Tree_Size	Viereck_Class_Code Tree_Cover_Percent Tree_DBH_cm

Rule 6: Consistent case

Recommended Implementation	
Use mixed case text within a table or field name. All uppercase words are especially straining to the human eye. Mixed case text presents a readable format that is more easily and quickly read. If data will be ported to an enterprise-level database system (i.e., Oracle) consider using uppercase object and field names. SQL Server will honor mixed case object and field names.	
Examples of Design	Examples of Better/Recommended Design
SPECIES_CODE SPECIES_COUNT behavior_code	Species_Code Species_Count Behavior_Code

Rule 7: Avoid special characters

Recommended Implementation	
<p>Do not use special characters in a table or field name.</p> <p>Allowable characters include A-Z, a-z, 0-9, and _ (underscore to separate words). Additionally, a name should never begin with a number. Do not use dashes in table or field names.</p> <p>Access is one of the only databases to even allow the use of special characters within names, so other databases, development tools, and analysis tools often have difficulty using these fields without custom workarounds added by the programmer or user.</p>	
Examples of Design	Examples of Better/Recommended Design
Project Park/Region Project\$ ProjLead_Phone Project Complete?	Project_Park_Or_Region Project_Cost Proj_Lead_Phone_Num Is_Project_Complete

Rule 8: Avoid unknown abbreviations

Recommended Implementation	
<p>Avoid abbreviations unless necessary due to field length.</p> <p>If an abbreviation is needed, make every attempt to use one that is known within the organization or one that can be easily deciphered. Avoid an abbreviation that is a word itself or has multiple meanings.</p> <p>Some older flat file systems limit table (file) and field names to 8 or 10 characters, respectively. Most relational databases have a limit of approximately 30 characters. Since Access and Oracle are the NPS standards and they do not impose these limits, mandating the use of terse names and extensive abbreviating for all tables and fields is not necessary. However, it is strongly recommended that spatial data or attribute data which could be imported into GIS or other PC database software (ArcView, dBase, etc.) use 8 character maximum table and 10 character maximum field names. Keep in mind that in cases where data is exported into a DBF, table and field names longer than 8 or 10 characters, respectively, will be truncated upon import, potentially sacrificing information by resulting in duplicative or unclear naming. In other cases, take advantage of additional characters to eliminate the ambiguity of table and field names.</p>	
Examples of Design	Examples of Better/Recommended Design
SmpTrnID Spp_Cd VeStCnt GeoLocateID	Sample_Transect_ID Species_Code Vertical_Strata_Count Site_ID

Rule 9: Limit length

Recommended Implementation	
Limit the length of table and field names to approximately 20 characters maximum (also see Rules 8 and 10). This limit is set more for practicality than any other reason. Most database servers do have a maximum limit of approximately 30 characters, though. Shorter names can be typed more quickly and are easier to remember. Also, longer names can sometimes extend past the width of set drop down lists, so only the first part of a name is visible. If data will be used in GIS attribute tables for shapefiles (i.e., dBase format), consider limiting field names to 10 characters (see Rule 10). Find an optimal field length where the name is not too tedious, but the name still clearly represents the data stored in it.	
Examples of Design	Examples of Better/Recommended Design
Water_Quality_Evaluation_Code Geomorphic_Disturbance_Description Area_Average_Azimuth_Magnetic	H2O_Quality_Eval_Code Geomorphic_Disturb_Desc Area_Avg_Azimuth_Mag

Rule 10: Define short aliases

Recommended Implementation	
Define short alias names for all fields (also see Rule 9). All fields should be given a short name alias of 10 characters or less. If data will be used in GIS attribute tables for shapefiles (i.e., dBase format), 10 character field names are required. For field names that are less than or equal to 10 characters, repeat the field name as the alias.	
Examples of Design	Examples of Better/Recommended Design
Water_Quality_Evaluation_Code Geomorphic_Disturbance_Description Area_Average_Azimuth_Magnetic	H2O_Q_Code Geom_DDdesc Avg_Az_Mag

Rule 11: Primary or Foreign Key Identification

Recommended Implementation	
Use a standard suffix for primary and foreign keys. Identify the primary keys with a _ID suffix. In cases where an MS Access database may interface with another database platform (.e.g.Oracle) it may be desirable to identify foreign keys using the field name. If so, foreign key fields can optionally be identified with the suffix _IDF.	
Examples of Design	Examples of Better/Recommended Design
SPECIES_KEY EventFKKey	Species_ID Event_IDF

Rule 12: Single value

Recommended Implementation	
Choose a field to contain a single value. Data entry, validation and retrieval are more difficult when a single field contains multiple, independent values.	
Examples of Design	Examples of Better/Recommended Design
Full_Name City_State_Zip	First_Name, Last_Name City_Name, State_Code, Zip_Code

Rule 13: Avoid storing calculations

Recommended Implementation	
Choose a field to be independent of all other field values. Rather than storing a calculated value in the database, a better choice is to store in independent operands and perform calculations dynamically for display within queries, forms, or reports. Stored calculations run the risk of not being updated when one of the individual elements changes. However, in certain instances, a trade-off in efficiency vs. storage space or security concerns may necessitate storage of calculated values.	
Examples of Design	Examples of Better/Recommended Design
Plot_Area_m2	Plot_Width_m, Plot_Length_m

Rule 14: Singularize names

Recommended Implementation	
Choose the singular noun or noun_adjective form for a field name. Where applicable, try to use singular Noun_Adjective format rather than plural Noun_Adjective or Adjective_Noun structures.	
Examples of Design	Examples of Better/Recommended Design
Life_Stages Scientific_Species_Name	Life_Stage Species_Name_Scientific

Rule 15: Prefix form and report controls

Recommended Implementation
Prefix controls on forms and reports with appropriate and consistent abbreviations While controls are usually not involved with data sharing and integration, consistent prefixes for controls will facilitate code development and long term application maintenance.
The following list contains some recommended prefixes for form and report controls: <ul style="list-style-type: none">• Chart = cht• Check box = chk• Combo box = cbo• Command button = cmd• Frame = fra• Label = lbl• Line = lin• List box = lst• Option button = opt• Option group = grp• Page break = brk• Rectangle (shape) = shp• Text box = txt• Toggle button = tgl

I&M Recommendations

It is recommended that all objects in Inventory and Monitoring Program databases be named using these recommendations. For Natural Resource Database Template (NRDT) databases, object names will be expected to conform to these guidelines in the event that data is integrated with other I&M databases or data management systems.

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More Information

Natural Resource Database Template (NRDT) webpage:

<http://science.nature.nps.gov/im/apps/template/index.htm>

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