APPENDIX I
DATABASE DESIGN OBJECTIVES AND METHODOLOGY

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Tables and Figures

Introduction

We adopted the rigorous database development procedure offered by Hernandez (1997) to create the Utah Exclosure Inventory database. This elaborate process was designed to ensure that the final digital database implementation would be able to satisfy project objectives.

Scientific databases and databases used for resource management rarely include such thorough documentation. However, as this project has progressed, it became clear to us that this documentation, which describes both the database contents and the steps needed to determine that content, could be of great value to anyone interested in developing their own databases.

Design Stage 1: Defining the Mission Statement and Mission Objectives

The UT Exclosure Inventory database is an analytical, rather than operational, database. In other words, the database was intended to be compiled and analyzed only once, and was not intended to be continually updated. Its primary function was to provide the information needed to evaluate the following key questions:

- Have exclosures provided valuable information for range managers?
- Which exclosures are most valuable now?

The process of assembling the database answered the first question, while the information contained in the database was applied to the second question. Figure I.1 elaborates on these questions.

Finally, one more critical, but not necessarily obvious, question needed to be posed: why did we need a *digital* database?

- The exclosure "program" is very complex (has many dimensions) and there are many avenues for exploration. When it comes to manipulating data, electronic databases are far superior to paper databases.
- We also wanted to explore the challenges associated with creating digital databases for natural resource management.

Design Stage 2: Analyzing the Current Database (and Information Requirements)

This analysis focused on the following key questions:

- Information needs
    - What kinds of data do the users currently use?
    - What kinds of data would the users like to have, but do not?
    - Where could the users go to get the data they need?
- Operations
    - How are data collected (forms)?
    - How are those data managed (storage and maintenance)?
    - How are those data retrieved (queries)?
    - How are those data manipulated (analyses)?
    - How are those data presented (reports)?

Figure I.1. Key questions addressed by the UT Exclosure Inventory database project.

Have exclosures provided valuable information for range managers?

- What kinds of information do exclosures provide?
  - What do they tell us about the effects of herbivory?
    - Do they provide useful information about plant biomass removal?
    - Do they provide useful information about impacts to individual plant species?
    - Do they provide useful information about changes in community composition?
  - What do they tell us about range trends?
    - Do they provide useful information for assessing short-term trends?
    - Do they provide useful information for assessing long-term trends?
- How is exclosure information being used?
  - How do exclosures contribute to "ordinary" decision-making?
  - How do exclosures contribute to long-term planning?
  - How do exclosures contribute to conflict management?
  - How do exclosures contribute to resource protection?
  - How do exclosures contribute to new scientific understanding?
- How reliable is this information?
  - Do we do a good job of stating objectives?
  - Do we actually collect the data needed to address these objectives?
  - Do we use scientifically valid methods to collect these data?
  - Do these methods offer us the opportunity to learn something new?
- How well do we translate data into information?
  - How often do we synthesize?
  - How often do we revisit old data?
  - How often do we communicate these lessons to others?
- How valuable are exclosures, relative to other information tools?
  - What unique information do exclosures provide that other tools do not?
  - What are the costs most commonly associated with exclosures?

Which exclosures are most valuable now, and for what purpose?

- What purposes are we most interested in?
  - Are plots established to evaluate the effects of herbivory also useful for monitoring?
  - Are plots established to protect resources or experiments also useful for monitoring?
  - Are plots established for monitoring also useful for experimentation or protection?
- What do we need to know about an exclosure to assess its value?
  - Are the physical and experimental designs appropriate for drawing inferences?
  - Are the ecological circumstances typical or atypical?
  - Has the exclosure been adequately maintained throughout its history?
  - Has the exclosure been adequately monitored throughout its history?

Unfortunately, we found very little information for most exclosures. This obviously limited the amount and kinds of information that could be included in the database.

Table I.1 lists the *ideal* set of information that we would like to have for each exclosure, as determined by consultation with potential database users. Some of this information could only be gained from local sources (files and personal recollection), while others could be derived from maps. Table I.1 also indicates whether the information was widely available, i.e., something that range professionals already monitor out of habit.

Table I.1. Desired exclosure information and its availability. Physiographic, climatic, water, and soil features were derived from NRCS Ecological Site Descriptions (Pellant et al. 2000).

Characteristic	**Widely Available?**	**Obtain From Maps?**
Identity		
Exclosure name	Yes	No
Aliases	Yes	No
Location		
Legal description (Township, range, section, subdivision)	Yes	Yes
GPS coordinates	No	No
Narrative (directions)	No	No
Administration		
Land ownership / management agency	Yes	Yes
Management plan (AMP, etc.)	Yes	Yes
County	Yes	Yes
Exclosure design		
Parts		
Animals excluded	Yes	No
Fence type	Yes	No
Dimensions (sides and area)	Yes	No
Comparison ("control") plots	No	No
Design diagram available	No	No
Physical history		
Date of establishment	Yes	No
Agency responsible for establishment and maintenance	Yes	No
Modifications (enlargements or additions)	No	No
Fence condition and maintenance (full history)	No	No
Physiographic features		
Landform	No	Yes
Elevation	Yes	Yes
Slope and aspect	No	Yes
Water table depth	No	No
Flooding or ponding (frequency, duration, and depth)	No	No
Runoff class	No	No
Climatic features		
Frost-free and freeze-free periods	No	Yes
Mean annual precipitation	No	Yes
Monthly precipitation and temperatures	No	Yes
Water features		
Cowardin wetland classification	No	Yes
Rosgen stream classification	No	Yes
Soil features		
Parent material (kind and depth)	No	Yes
Surface texture and modifiers	No	No
Surface and subsurface fragments	No	No
Drainage class	No	No
Permeability class	No	No
Soil depth	No	No
Electrical conductivity	No	No
Sodium adsorption ratio	No	No
Soil reaction (pH)	No	No
Available water holding capacity	No	No
Calcium carbonate equivalent	No	No

Table I.1, continued. Desired exclosure information and its availability. Physiographic, climatic, water, and soil features were derived from NRCS Ecological Site Descriptions (Pellant et al. 2000).

Characteristic	**Widely Available?**	**Obtain From Maps?**
Vegetation features		
Vegetation classification (for each system)		
What is the designation	Yes	Yes
Basis for designation	No	No
Current plant community		
Cover, dominance, and production	Yes	No
Health / condition	No	No
Plant community history		
Expected dynamics (state and transition diagram)	No	No
Treatment and disturbance history	No	No
Herbivores		
Major herbivores	Yes	Yes
Browsing / grazing pressure history	No	No
Studies		
Metadata		
Study (transect) diagram or description	Yes	No
Standard methods used, or methods described	Yes	No
Details adequately noted (date, participants, etc.)	Yes	No
Data treatment		
Quantitative method?	No	No
Forms filed	Yes	No
Study event summarized	No	No
Analysis	No	No
Inside vs. outside comparison?	No	No
Compared to previous studies at this location?	No	No
Compared to other locations?	No	No
Synthesis		
Reason for establishment	Yes	No
Lessons learned (summarized)	No	No
Success or failure (relative to objectives)	No	No
Published or otherwise distributed?	No	No

Design Stage 3: Creating the Preliminary Field List

Unfortunately, due to the paucity of data available for most exclosures, we could only address a subset of the ideal attribute list depicted in Table I.1. This subset constituted the *preliminary field list* (Table I.2). This preliminary field list was a product of many individual decisions concerning the value and availability of different kinds of data:

- We limited the database to descriptors that could be reasonably applied to *all* exclosures, parts, or studies.
- We elected to omit spatial data that were not readily available but could be obtained via maps (e.g., soils information, county, UDWR unit, etc.).
- We chose to use default ("Not found") values to avoid problems commonly associated with null values (blanks).

- The studies were the most difficult aspect of the database to address.
    - We associated studies with parts instead of entire exclosures to accommodate synthetic studies that addressed all exclosure parts, and fence-line contrast photos that crossed parts.
    - We first tried to describe individual studies in terms of a fixed list of study types, but this proved to be too ponderous. Instead, we adopted a set of Yes/No fields to address the study characteristics that are most relevant to the project objectives.
    - We combined casual photo studies with expressly designed repeat photo studies, because casual photos can be repeated.
    - We decided to omit maintenance visits that simply describe the condition of the exclosure from the list of potential studies.
    - In our original scheme, we defined the term *study* to mean an individual data-gathering event, either within an exclosure partition or at an outside or nearby comparison plot. In this scheme, each part/year combination could have several records. Unfortunately, this approach proved to be too cumbersome. Instead, we decided to combine all of the data-gathering events for a given part/year combination into one record. As a consequence, one record could conceivably represent several separate attempts to gather data. Fortunately, this circumstance was very rare.
- We decided not to record individual study documents in the digital database, but instead opted for a set of Yes/No descriptors.
    - Using the Yes/No format for the different kinds of studies removes the cardinality issue (none or blank) and the need for an extra table.
    - We adopted a standardized document naming system that should make the documents relatively easy to identify (Design Stage 10).
- The digital database does not include fields for supplemental documents (maps, diagrams, and soil descriptions) because these did not contribute to our analysis. The standardized document naming system should make these documents easy to identify.

Table I.2. Preliminary field list for the UT Exclosure Inventory database.

Characteristic	Cardinality	Can this be standardized?
Identity		
Exclosure name	Unique	No
Administration		
Land ownership / management agency	1	Limited set
Location		
Legal description (these fields are tied together)		
Township	0 or 1	Formatted
Range	0 or 1	Formatted
Section	0 or 1	Formatted
Subdivision	0 or 1	Formatted
Exclosure design		
Purpose for establishment (exclosure type)	1	Limited set
Parts (for each part)		
Animals excluded	1	Limited set
Fence type	1	Limited set
Dimensions		
Side dimensions (ft)	0 to 1	Formatted
Area (ac)	0 to 1	Numeric
Physical history		
Date of establishment	1	Numeric
Current condition	1	Limited set
Alterations, treatments, and disturbances		
Type of alteration, treatment, or disturbance	0 to several	No
Year altered, treated, or disturbed	0 to several	Numeric
Vegetation features		
Range Type	1	Limited set
Studies		
Study date (year)	0 to several	Numeric
Part studied (fenced part, outside, or summary)	0 to several	Limited set
Quantitative vegetation study?	1	Yes/No
Qualitative vegetation study?	1	Yes/No
General-view photo study?	1	Yes/No
Close-up photo study?	1	Yes/No
Fenceline contrast photo study?	1	Yes/No
Study event summarized?	1	Yes/No
Inside vs. outside comparison?	1	Yes/No
Trend summarized?	1	Yes/No
Additional Comments	0 to 1	No

Design Stage 4: Creating the Preliminary Table List

The main subjects of interest (tables) could be inferred from the list of attributes (fields). At this stage there were 3 primary data tables:

- *Exclosures (entities)*: This data table contains the information needed to describe an individual exclosure as a whole, where the term *exclosure* refers to one discrete entity on the ground. This table has one record for each exclosure (entity). The fields were limited to those that are needed to assess the exclosure's value as a learning tool or as a source for monitoring data. The exclosure is the most basic unit of analysis.
- *Parts (entities)*: This data table contains the information needed to describe an exclosure part, where the term *part* refers to one enclosed (fenced) area. Although exclosure parts are clearly a component of exclosures, exclosures also vary in the number and kinds of parts that constitute their design. This table has one record for each exclosure part.
- *Studies (events)*: This data table contains the information needed to describe a cohesive data set, where the term *study* refers to the combination of exclosure part and study year for which the data were collected. While the exclosures and parts tables describe physical features, this table describes how the exclosure has been used.

Design Stages 5, 6, and 7: Refining the Preliminary Field List, Creating the Preliminary Table Structures, and Setting Primary Keys

Some of the fields described in Design Stage 3 did not conform to the characteristics of an *Ideal Field* (Hernandez 1997). In database design jargon, the process of modifying tables and fields to minimize errors is called *normalization*. For the UT Exclosure Inventory database, several steps were needed to ensure that the database conformed to the *third normal form*, which defines database integrity at the table level (Whitehorn and Marklyn 2002).

Although the preliminary field list did not include any multipart fields (fields that could be deconstructed into smaller components) or duplicate fields (fields that record separate instances of the same kind of data), it did include multi-valued fields (fields that could contain more than one value per record). These fields needed to be subdivided into component fields representing only one attribute each.

In addition to subdividing multi-valued fields, we also took the following steps to refine the preliminary field list (Table I.3):

- Aliases were included in the [Exclosures].[Additional Comments] field, rather than as a separate field, to simplify the database structure.
- Because it is a calculated field, the number of parts should be re-created in a view, rather than stored in a data table.
- We chose not to link the [Parts].[Animals Excluded] and [Studies].[Part Studied] fields because studies also occur in nearby plots that are not uniquely associated with an exclosure. As a consequence, the *Studies* table includes a [Part Studied] field that introduces a minor amount of redundancy into the overall database.

The act of refining the preliminary field also expanded the set of data tables from 3 to 4 (Table I.3). Because we chose to use one set of characteristics to describe all exclosures, the database does not include any subset tables.

- The *Exclosures* data table has one record for each individual exclosure. We rearranged fields to improve logical continuity.
- The *Parts* data table contains the characteristics needed to adequately describe an exclosure part. Each exclosure has at least one part, and some may have several parts.
- The *Alterations Treatments and Disturbances* data table contains information describing alterations, treatments, or disturbances that have been recorded for exclosures. Most exclosures do not have a treatment or disturbance record. Each record represents one alteration, treatment, or disturbance for a particular exclosure. These were formerly multi-valued fields in the *Exclosures* data table.
- The *Studies* data table contains the information needed to describe the studies that have been conducted in, immediately outside of, or near to exclosures. Each record represents all of the studies conducted in an exclosure part or near an exclosure during a particular year. As a consequence, a record may represent a single study "event," where the event is defined as a visit to the exclosure, or several events, if the exclosure was visited more than once in a particular year. Likewise, an individual event may include one or several kinds of data collection efforts (photographs, line intercept sampling, etc.). An exclosure may have many studies or none. The Yes/No fields are not mutually exclusive or independent. Note that outside or nearby plots cannot have a "Yes" value for either fence-line contrast photos or inside vs. outside comparisons.

Finally, the tables described in Design Stages and 4 and 6 did not yet conform to the characteristics of *Ideal Tables* (Hernandez 1997). While we removed duplicate fields, minimized redundancy, and ensured that each table addressed a distinct subject, not all tables had primary keys. We used the following criteria to define primary keys:

- The [Exclosure Name] field serves as the primary key for the *Exclosures* table and as a foreign key field for the 3 linked tables (Table I.3). As a general rule, exclosure names were unique. In cases where an exclosure name was used several times (e.g., Cottonwood, Big Flat), we appended additional information (such as location or administrative unit) to the name to provide a unique identifier.
- For the 3 linked tables, we chose to create simple primary key fields by concatenating the [Exclosure Name] field with the combination of fields that uniquely identifies each record.
    - For the *Parts* table, individual exclosure partitions were uniquely identified by concatenating the [Parts].[Animals Excluded] field onto the [Parts].[Exclosure Name] field.
    - For the *Alterations Treatments and Disturbances* table, individual events were uniquely identified by concatenating the [Alterations Treatments and Disturbances].[ATD Year] field onto the [Alterations Treatments and Disturbances].[Exclosure Name] field.
    - For the *Studies* table, individual records were uniquely identified by concatenating the [Studies].[Study Year] and [Studies].[Part Studied] field onto the [Studies].[Exclosure Name] field. This combination was also used to uniquely label individual study documents (Design Stage 10).

Table I.3. Preliminary table structures and refined preliminary field list.

Table and Field	Data Type	Key
Exclosures		
Exclosure Name	Plain text	Primary key
Administration: Land ownership / management agency	Limited text	No
Location: Township	Plain text	No
Location: Range	Plain text	No
Location: Section	Plain text	No
Location: Subdivision	Plain text	No
Exclosure Purpose / Type	Limited text	No
Date of establishment	Numeric	No
Current condition	Limited text	No
Range type	Limited text	No
Additional comments	Memo	No
Parts		
Exclosure Name	Plain text	Foreign key
Animals excluded	Limited text	No
Fence type	Limited text	No
Dimensions (ft)	Plain text	No
Area (ac)	Numeric	No
Alterations Treatments and Disturbances		
Exclosure Name	Plain text	Foreign key
Year altered, treated or disturbed	Numeric	No
Description of alteration, treatment, or disturbance	Plain text	No
Studies		
Exclosure Name	Plain text	Foreign key
Year studied	Numeric	No
Part studied (includes outside plots and summaries)	Limited text	No
Quantitative vegetation study?	Yes/No	No
Qualitative vegetation study?	Yes/No	No
General-view photo study?	Yes/No	No
Close-up photo study?	Yes/No	No
Fence-line contrast photo study?	Yes/No	No
Study event summarized?	Yes/No	No
Inside vs. outside comparison?	Yes/No	No
Trend summarized?	Yes/No	No

Design Stage 8: Field Specifications (Field-Level Data Integrity)

Hernandez (1997) used the term *Field Specifications* to refer to the field information needed to implement the conceptual database in a digital framework. In an MS Access database, this information is stored as *Field Properties*. Rather than catalog the field specifications here, we encourage users to consult the Field Properties associated with each field in the database. However, two important points should be raised here:

- While the [Exclosure Name] field occurs in all tables, the remaining fields are unique to their respective data tables.
- With the exception of the [Exclosures].[Additional Comments] field, all fields are mandatory. Non-key fields include default values.

Design Stage 9: Table Relationships (Relationship-Level Data Integrity)

The relationships in this database are all simple, direct, dependent, and ownership-oriented. The *Exclosures* table is the parent table in all relationships.

- *Exclosures* to *Parts*
- *Exclosures* to *Alterations Treatments and Disturbances*
- *Exclosures* to *Studies*

All relationships have the following characteristics:

- The field [Exclosure Name] serves as both primary key and foreign key fields.
- Referential Integrity enforced
- Type of Relationship: one-to-many
- Modification Rule: Cascade update (to allow changes from a query-based form)
- Deletion Rule: Cascade delete (ownership-oriented)
- Join Type: Inner join (the dynaset should include only records that have corresponding values in both tables)
- Type of Participation:
    - Parent table = mandatory
    - Child table = optional
- Degree of Participation:
    - Parent table = (1, 1)
    - Child table = (0, N)

Design Stage 10: Business Rules and Validation Tables

The term *business rules* refers to a set of standards adopted during the database design process to make digital database implementation easier and more reliable (Hernandez 1997). Typically, business rules define the range of potential values for individual fields, as well as allowable relationships among fields and tables.

For the Utah Exclosure Inventory database, we implemented business rules as standard conventions recorded in validation tables. With the exception of the Yes/No fields included in the *Studies* table (which use check boxes), data were validated at the form level with combo boxes. Because of their complexity, business rules have been assigned to a separate appendix (Appendix II, Business Rules and Validation Data).

Design Stage 11: Views

V*iews* are virtual tables used to view data in a certain way (Hernandez 1997). These views, more commonly referred to as *queries*, provide the primary interface between the database and the user.

The Utah Exclosure Inventory database was not meant to be continually updated. As a consequence, standardized views are a less critical component of the final product. However, working through queries during the early stages of database design helped prevent many potential design problems. We encourage users to examine the queries included in the MS Access database in Design View to see how they were created.

The master table (Appendix IV, Master Table) includes the most basic descriptive characteristics for each exclosure. This table is essentially a repeat of Laycock's (1969) original effort.

The remaining tables (Appendix V, Summary Table) were created to summarize the exclosure-building program in its entirety. These tables were constructed from crosstab queries based on counts (numeric variables were converted into categorical variables). Because these are summary tables, most include condition as a dimension:

- We created the following queries to summarize the exclosure inventory in terms of physical characteristics:
  - [Landowner by condition] (Table IV.1) summarizes of the distribution of exclosures across administrative boundaries.
  - [Landowner by purpose] (Table IV.2) summarizes the distribution of exclosures across administrative boundaries and purpose.
  - [Range type by condition] (Table IV.3) summarizes the distribution of all exclosures across range types and conditions.
  - [Range type by purpose] (Table IV.4) summarizes the distribution of all exclosures across range types and purposes.
  - [Range type by part type] (Table IV.5) summarizes the distribution of exclosures by range types and part types (animals excluded).
  - [Range type by area] (Table IV.6) summarizes the distribution of exclosure parts (not exclosures) by area and range type.
  - [Treatments by range type] (Table IV.7) summarizes the distribution of exclosures by range type and treatment (using keywords).
  - [Animals excluded by condition] (Table IV.8) summarizes the distribution of enclosed partitions (not exclosures).
  - [Animals excluded by area] (Table IV.9) summarizes the distribution of enclosed partitions (not exclosures) by size.
  - [Number of parts by condition] (Table IV.10) demonstrates how rare multiple-partition exclosures are.
  - [Part combinations] (Table IV.11) summarizes the kinds of combinations that are typically seen in multi-part tables.
  - [Area by condition] (Table IV.12) summarizes the distribution of exclosure parts (not exclosures) across sizes.
- We created the following queries assess how the exclosure building "program" has changed over time.
  - [Year by condition] (Table IV.13) summarizes the distribution of exclosures by year.
  - [Year by condition for BLM] (Table IV.14) summarizes the construction of all BLM exclosures by year.
  - [Year by condition for USFS] (Table IV.15) summarizes the construction of all USFS exclosures by year.
  - [Year by purpose] (Table IV.16) summarizes the distribution of exclosures by year and purpose.
- We created the following queries to evaluate the information content associated with the exclosure inventory. Note that study events are particularly difficult to summarize because they are not independent in terms of part studied or type of study.
  - [Studies by landowner] (Tables IV.17 and IV.18) summarizes the distribution of individual studies and study summaries across administrative boundaries.
  - [Studies by purpose] (Tables IV.19 and IV.20) summarizes the distribution of individual studies and study summaries across different exclosure types.

- [Vegetation studies range type by year] (Table IV.21) summarizes the distribution of vegetation studies across range types and years.
- [Photo studies range type by year] (Table IV.22) summarizes the distribution of photo studies across range types and years.
- [Vegetation studies range type by part] (Table IV.23) summarizes the distribution of vegetation studies across different range types and part types.
- [Photo studies range type by part] (Table IV.24) summarizes the distribution of photo studies across different range types and part types.
- [Part vegetation study comparison] (Table IV.25) addresses the possible pairwise part comparisons (e.g., LX vs. OP) offered by the vegetation studies in the database.
- [Part photo study comparison] (Table IV.26) addresses the possible pairwise part comparisons offered by the photo studies in the database.

Design Stage 12: Reviewing Data Integrity

Hernandez (1997) recommends a modular approach to reviewing data integrity. At this stage in the database design process, we were able to ensure database integrity at the following levels:

- Table-level integrity (Design Stages 6 and 7)
    - There were no duplicate fields in any tables
    - There were no calculated fields in any tables
    - There were no multi-valued fields in any tables
    - There were no multipart fields in any tables
    - There were no duplicate records in any tables
    - Every record in all tables are identified by a primary key value
    - Each primary key conformed to the *Elements of a Primary Key*
- Field-level integrity (Design Stages 5 and 8)
    - Each field conformed to the *Elements of an Ideal Field*
    - A set of *Field Specifications* was defined for each field
- Relationship-level integrity (Design Stage 9)
    - All table relationships were properly established
    - Appropriate deletion rules were established for each relationship
    - The type of participation was correctly identified for each relationship
    - The proper degree of participation was established for each relationship
- Business rules (Design Stage 10)
    - Each rule imposed a meaningful constraint
    - The proper category has been determined for the rule
    - Each rule was properly defined and established
    - The appropriate Field Specification elements or table relationship characteristics were properly modified
    - The appropriate validation tables were established

Design Stage 13: Forms and Reports

We created a single form to ensure valid data entry and provide a meaningful way to interact with the entire database at once (Figure I.2). We also used this template to record exclosure characteristics in the MS Word summary files. In the MS Word templates, we left “Not found” values blank and replaced “No” values with a dash (-) to improve appearance and readability. The “Not found” and “No” values are recorded in the MS Access database (using default values).

Figure I.2. UT Exclosure Inventory data summary template and digital database data entry form.

Exclosure Name

Land ownership / management agency	<<std value>>			
Location	<<NESW>>	<<S##>>	<<T#S>>	<<R#W>>
Purpose for establishment	<<std value>>			
Date of establishment	<<year>>			
Current condition	<<std value>>			
Range Type	<<std value>>			

Parts	*Fence Type*	*Dimensions (ft)*	*Area (ac)*
<<Animals Excluded std value>>	<<std value>>	<<X ft x Y ft>>	##
<<Animals Excluded std value>>	<<std value>>	<<X ft x Y ft>>	##

Alterations, treatments, and disturbances	
year	<<Type of alteration, treatment, or disturbance>>
year	<<Type of alteration, treatment, or disturbance>>

Studies		*QTV*	*QLV*	*GVP*	*CUP*	*FLC*	*Summary*	*I vs. O*	*Trend*
year	<<part>>	Y/-	Y/-	Y/-	Y/-	Y/-	Y/-	Y/-	Y/-
year	<<part>>	Y/-	Y/-	Y/-	Y/-	Y/-	Y/-	Y/-	Y/-

Additional Comments

<<comments here>>

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