Public Review Draft
Biological Data Profile
of the Content Standard for Digital Geospatial Metadata

Biological Data Working Group
Federal Geographic Data Committee
and USGS Biological Resources Division

July 1998
Established by Office of Management and Budget Circular A-16, the Federal Geographic Data Committee (FGDC) promotes the coordinated development, use, sharing, and dissemination of geographic data.

The FGDC is composed of representatives from the Departments of Agriculture, Commerce, Defense, Energy, Housing and Urban Development, the Interior, State, and Transportation; the Environmental Protection Agency; the Federal Emergency Management Agency; the Library of Congress; the National Aeronautics and Space Administration; the National Archives and Records Administration; and the Tennessee Valley Authority. Additional Federal agencies participate on FGDC subcommittees and working groups. The Department of the Interior chairs the committee.

FGDC subcommittees work on issues related to data categories coordinated under the circular. Subcommittees establish and implement standards for data content, quality, and transfer; encourage the exchange of information and the transfer of data; and organize the collection of geographic data to reduce duplication of effort. Working groups are established for issues that transcend data categories.

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## CONTENTS

<table>
<thead>
<tr>
<th>Page</th>
<th>Introductory Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>v</td>
<td>1. Objective</td>
</tr>
<tr>
<td>v</td>
<td>2. Scope</td>
</tr>
<tr>
<td>v</td>
<td>3. Applicability</td>
</tr>
<tr>
<td>vi</td>
<td>4. Related Standards</td>
</tr>
<tr>
<td>vii</td>
<td>5. Standards Development Procedures</td>
</tr>
<tr>
<td>ix</td>
<td>6. Maintenance Authority</td>
</tr>
<tr>
<td>1</td>
<td>Elements of the Content Standard for Digital Geospatial Metadata</td>
</tr>
<tr>
<td>3</td>
<td>Changes to the Content Standard for Digital Geospatial Metadata</td>
</tr>
<tr>
<td>3</td>
<td>Conditionality Changes</td>
</tr>
<tr>
<td>5</td>
<td>Domain Changes</td>
</tr>
<tr>
<td>11</td>
<td>Extended Elements</td>
</tr>
<tr>
<td>49</td>
<td>Appendix A: Glossary</td>
</tr>
<tr>
<td>51</td>
<td>Appendix B: Index</td>
</tr>
<tr>
<td>53</td>
<td>Appendix C: References</td>
</tr>
</tbody>
</table>
Introductory Material

1. Objective. It has been determined that modifications to the FGDC Content Standard for Digital Geospatial Metadata are needed to create meaningful metadata for biological data sets, thus the objective of the profile is to provide a common set of terminology and definitions for the documentation of biological data.

2. Scope. This profile is intended to support the collection and processing of biological data. It is intended to be useable by all levels of government and the private sector. The standard is not intended to reflect an implementation design. An implementation design requires adapting the structure and form of the profile to meet application requirements.

The profile was developed from the perspective of defining the information required by a prospective user to determine the availability of a set of biological data; to determine the fitness of a set of biological data for an intended use; to determine the means of accessing the set of biological data; and to successfully transfer the set of biological data. As such, the profile establishes the names of extended data elements and compound elements (groups of data elements) to be used for documenting biological data, the definitions of these extended compound elements and data elements, and information about the values that are to be provided for the data elements. The profile also describes any modifications to the optionality or repeatability of non-mandatory elements and any modifications to the domains of standard elements in the FGDC’s Content Standard for Digital Geospatial Metadata. The profile does not specify the means by which this information is organized in a computer system or in a data transfer, nor the means by which this information is transmitted, communicated, or presented to the user.

3. Applicability. Executive Order 12906, “Coordinating Geographic Data Acquisition and Access: The National Spatial Data Infrastructure,” was signed on April 11, 1994, by President William Clinton. Section 3, Development of a National Geospatial Data Clearinghouse, paragraph (b) states:
“Standardized Documentation of Data. Beginning 9 months from the date of this order, each agency shall document all new geospatial data it collects or produces, either directly or indirectly, using the standard under development by the FGDC, for documenting, to the extent practicable, geospatial data previously collected or produced, either directly or indirectly, and making that data documentation electronically accessible to the Clearinghouse network.” This is an official profile of the data documentation standard referenced in the executive order. It is designed to document biological datasets, both geospatial and non-geospatial in nature.

In addition to use by the Federal Government, the FGDC invites and encourages organizations and persons from State, local, and tribal governments, the private sector, and non-profit organizations to use the profile to document their biological data. A major difficulty in the data community is the lack of information that helps prospective users to determine what data exist, the fitness of existing data for planned applications, and the conditions for accessing existing data, and the transfer of data to a user’s system. This profile, developed with the aid of public participation, will help to ease these problems and to develop the National Spatial Data Infrastructure, National Information Infrastructure, and National Biological Information Infrastructure.

4. Related Standards The Content Standard for Digital Geospatial Metadata was developed to identify and define the metadata elements used to document digital geospatial data sets for many purposes. These include metadata to: 1) preserve the meaning and value of a data set; 2) contribute to a catalog or clearinghouse and; 3) aid in data transfer. The Biological Data Profile of the Content Standard for Digital Geospatial Metadata was developed to identify and define the metadata elements used to document biological data sets for the same purposes. Since biological data sets can be either geospatial or non-geospatial in their nature, the Biological Data Profile is designed to be used to document both geospatial and non-geospatial data sets. As a profile, all the requirements of the Content Standard for Digital Geospatial Metadata must be met for any geospatial biological data set. Since the Biological Data Profile
extends the use of the Content Standard for Digital Geospatial Metadata into documenting non-geospatial data sets, when biological in nature, some data elements required for documenting geospatial data sets may be of marginal use for documenting non-geospatial data holdings. Under these conditions, these data elements may contain a phrase such as “not applicable”.

The Spatial Data Transfer Standard (SDTS) was developed to allow the transfer of digital spatial data sets between spatial data software. Since the SDTS is a standard for data transfer, its primary metadata content is used to determine the fitness of a geospatial data set for the user’s purpose. There is a close relationship between the Content Standard for Digital Geospatial Metadata and its associated profiles with the SDTS metadata elements contained in the Data Quality module, and in other locations inside of the SDTS transfer set. Since the Content Standard for Digital Geospatial Metadata and its profiles contain metadata used to search for digital spatial data sets through a clearinghouse (metadata for locating, describing access, use, and distribution), these elements may not be contained in an SDTS transfer set. Since the Biological Data Profile is designed to be used to document biological data sets which are not necessarily geospatial, these metadata will likely never be transferred via an SDTS transfer.

The June 8, 1994 FGDC Metadata Standard was used as the base document for the International Organization for Standards (ISO) 15046 Part 15. The draft ISO Metadata Standard 15046 Part 15 has had a number of changes made to it. At the time this profile was prepared, the ISO Metadata Standard was still in Committee Draft form and subject to significant change before final approval, therefore this profile may not reflect the current ISO draft, but is thought to be consistent with it.

5. Standards Development Process The Federal Geographic Data Committee (FGDC) initiated work on the Content Standards for Digital Geospatial Metadata in June, 1992, through a forum on geospatial metadata. At the forum, the participants agreed on the need for a standard on the information content of metadata about geospatial data. The committee accepted the offer of AST12 Section D18.01.15
to develop a draft information content standard. This draft was slightly revised, and offered for public
review from October 1992 to April 1993. Extensive comments were received from the public. The FGDC
Standards Working Group revised the draft. The revised draft was provided for further review and testing
in July 1993. Refined drafts were offered for review and testing in January and March 1994. It was
officially adopted by the FGDC June 8, 1994.

Since the Metadata Standard was adopted, it has been implemented by numerous Federal, state, and local
agencies, companies, and groups. It has also been used by other nations as they develop their own
national metadata standards. Proposed changes to the Metadata Standard have been suggested during the
time since it was issued. Further, an implementor’s workshop was held specifically to discuss strengths,
weaknesses, and proposed improvements. Drawing on this body of knowledge, the FGDC modified the

The National Biological Service (NBS) was formed in 1993 from the research and related activities of
seven Department of the Interior bureaus, with the largest components coming from the U.S. Fish and
Wildlife Service and the National Park Service. The mission of the NBS was to work with others to
provide the scientific understanding and technologies needed to manage the Nation’s biological resources.

In an effort to make data and information on biological resources more accessible for more people, the
NBS developed a national partnership for sharing biological information: the National Biological
Information Infrastructure (NBII). The NBS was integrated into the USGS in October 1996 as its
Biological Resources Division. The NBII, now a USGS-led initiative, is dedicated to the development of
an electronic "federation" of biological data and information sources. The goal of the NBII is to provide
swift user access to biological databases, information products, directories, and guides maintained by
Federal, State, and local government agencies, non-government institutions, and private sector
organizations in the United States and around the world. Thus the NBII promotes the availability of
biological information and its associated documentation on the internet.
In order to provide a standardized method for documenting biological data and information, an ad hoc working group met in November 1994 to develop a “strawman” metadata standard. The original strawman standard was created for documenting data and information considered non-spatial, and thus not being documented using the FGDC’s Content Standards for Digital Geospatial Metadata. The NBS then commissioned the American Institute of Biological Sciences (AIBS) to convene a workshop of national experts in the biological sciences to peer review and recommend modifications to the “strawman” metadata standard. This workshop was held May 16 and 17, 1995. The workshop participants reviewed the content of the NBS’s strawman Metadata Standard for Non-Geospatial Data to assure completeness and utility of the content from the biological science perspective. The AIBS review strongly supported the idea of refocusing from “non-geospatial” data sets to “Biological resource” data sets, regardless of their geospatial or non-geospatial characteristics. Thus the standard which was then produced: The Content Standard for NBII Metadata was a superset of the FGDC’s Content Standards for Digital Geospatial Metadata. This allowed the use of one metadata standard with the choice of data elements appropriate for documenting a given data set regardless of whether it is geospatial or non-geospatial in nature. The draft NBII Metadata Standard was presented three times to the FGDC standards working group. In February 1996 the Standards Working Group supported the interim implementation of the “Content Standard for NBII Metadata”. In February 1997 the Standards Working Group approved the NBII Metadata Standard as being in Draft Stage.

In 1998, with the revision of the FGDC Content Standard for Digital Geospatial Metadata, and the clarification of the profile creation process, the FGDC Biological Data Working Group supported the revision of the NBII Metadata standard into a profile of the Content Standard for Digital Geospatial Metadata. It was released for public review in July 1998.

6. Maintenance Authority The current maintenance authority for the profile is the USGS Biological Resources Division. Questions concerning the profile should be addressed to: Biological Data...
Profile Questions, c/o USGS Center for Biological Informatics, Biological Resources Division, P.O. Box 25046, DFC, MS 302, Denver, CO 80225-0046. Copies of this publication are available from the Federal Geographic Data Committee Secretariat, in care of the U.S. Geological Survey, 590 National Center, Reston, Virginia 20192; telephone (703) 648-5514; facsimile (703) 648-5755; Internet (electronic mail) fgdc@www.fgdc.gov. The text also is available from anonymous File Transfer Protocol (anonymous ftp) server www.fgdc.gov and at the FGDC web site http://www.fgdc.gov/Metadata/Metadata.html.
Elements of the Content Standard for Digital Geospatial Metadata

All the standard elements of the Content Standard for Digital Geospatial Metadata are available for use in the Metadata Profile for Biological Data. All the mandatory elements from the Content Standard for Digital Geospatial Metadata must be provided in a metadata document compliant with the CSDGM Profile for Biological Data.
Changes to the Content Standard for Digital Geospatial Metadata

Conditionality Changes

There are no changes to the conditionality of Standard elements from their original use in the Standard.

Since biological data sets can be either geospatial or non-geospatial in their nature, the Biological Data Profile is designed to be used to document both geospatial and non-geospatial data sets. As a profile, all the requirements of the Content Standard for Digital Geospatial Metadata must be met for any geospatial biological data set. Since the Biological Data Profile extends the use of the Content Standard for Digital Geospatial Metadata into documenting non-geospatial data sets, when biological in nature, some data elements required for documenting geospatial data sets may be of marginal use for documenting non-geospatial data holdings. Under these conditions, these data elements may contain a phrase such as “not applicable”. These elements include, but are not limited to Logical_Consistency_Report, and Geospatial_Data_Presentation_Form.
Domain Changes

Due to the extension of the use of the Content Standard for Digital Geospatial Metadata into the use for documenting biological data sets in general, some additions to domains of standard elements are required. These changes are detailed below, using the numbering scheme found in the Content Standard for Digital Geospatial Metadata, the element name, the domain as defined in the Content Standard for Digital Geospatial Metadata, and then the additions.

1.3.1 Currentness Reference

   Domain: “ground condition” “publication date” free text

   Extended Domain: “observed”

2.2 Logical Consistency Report

   Domain: free text

   Extended Domain: “not applicable”

2.5.1.3 Type of Source Media

   Domain: “paper” “stable-base material” “microfiche” “microfilm” “audiocassette” “chart”

   “filmstrip” “transparency” “videocassette” “videodisc” “videotape” “physical model”

   “computer program” “disc” “cartridge tape” “magnetic tape” “online” “CD-ROM”

   “electronic bulletin board” “electronic mail system” free text

   Extended Domain: “digital database file” “field notes” “photographic print”

   “printed table” “visually observed or measured”

2.5.1.4.1 Source Currentness Reference

   Domain: “ground condition” “publication date” free text
Extended Domain: “observed”

### 6.4.2.1.1 Format Name

Domain: domain values from the table below; free text

<table>
<thead>
<tr>
<th>Domain</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>“ARCE”</td>
<td>ARC/INFO Export format</td>
</tr>
<tr>
<td>“ARCG”</td>
<td>ARC/INFO Generate format</td>
</tr>
<tr>
<td>“ASCII”</td>
<td>ASCII file, formatted for text attributes, declared format</td>
</tr>
<tr>
<td>“BIL”</td>
<td>Imagery, band interleaved by line</td>
</tr>
<tr>
<td>“BIP”</td>
<td>Imagery, band interleaved by pixel</td>
</tr>
<tr>
<td>“BSQ”</td>
<td>Imagery, band interleaved sequential</td>
</tr>
<tr>
<td>“CDF”</td>
<td>Common Data Format</td>
</tr>
<tr>
<td>“CFF”</td>
<td>Cartographic Feature File (U.S. Forest Service)</td>
</tr>
<tr>
<td>“COORD”</td>
<td>User-created coordinate file, declared format</td>
</tr>
<tr>
<td>“DEM”</td>
<td>Digital Elevation Model format (U.S. Geological Survey)</td>
</tr>
<tr>
<td>“DFAD”</td>
<td>Digital Feature Analysis Data (National Imagery and Mapping)</td>
</tr>
<tr>
<td>“DGN”</td>
<td>Microstation format (Intergraph corporation)</td>
</tr>
<tr>
<td>“DIGEST”</td>
<td>Digital Geographic Information Exchange Standard</td>
</tr>
<tr>
<td>“DLG”</td>
<td>Digital Line Graph (U.S. Geological Survey)</td>
</tr>
<tr>
<td>“DTED”</td>
<td>Digital Terrain Elevation Data (MIL-D-89020)</td>
</tr>
<tr>
<td>“DWG”</td>
<td>AutoCAD Drawing format</td>
</tr>
<tr>
<td>“DX90”</td>
<td>Data Exchange ‘90</td>
</tr>
</tbody>
</table>
“DXF” AutoCAD Drawing Exchange Format
“ERDAS” ERDAS image file (ERDAS Corporation)
“GRASS” Geographic Resources Analysis Support System
“HDF” Hierarchical Data Format
“IGDS” Interactive Graphic Design System format (Intergraph Corporation)
“IGES” Initial Graphics Exchange Standard
“MOSS” Multiple Overlay Statistical System export file
“netCDF” network Common Data Format
“NITF” National Imagery Transfer Format
“RPF” Raster Product Format (National Imagery and Mapping Agency)
“RVC” Raster Vector Converted format (MicroImages)
“RVF” Raster Vector Format (MicroImages)
“SDTS” Spatial Data Transfer Standard (Federal Information Processing Standard 173)
“SIF” Standard Interchange Format (DOD Project 2851)
“SLF” Standard Linear format (National Imagery and Mapping Agency)
“TIFF” Tagged Image File Format
“TGRLN” Topologically Integrated Geographic Encoding and Referencing (TIGER) Line format (Bureau of the Census)
“VPF” Vector Product Format (National Imagery and Mapping Agency)

Extended Domain:

“DBF” dBASE data file
“DIF” VisiCalc format
“DOC” Microsoft Word file
“EPS” Encapsulated Postscript
“FW” Framework spreadsheet or database format
8.6 Geospatial Data Presentation Form

Domain: (the listed domain is partially from pp. 88-91 in Anglo-American Committee on Cataloguing of Cartographic materials, 1982, Cartographic materials: A manual of interpretation for AACR2: Chicago, American Library Association):

“atlas” “audio” “diagram” “document” “globe” “map” “model”

“multimedia presentation” “profile” “raster digital data”
“remote-sensing image” “section” “spreadsheet” “tabular digital data”

“vector digital data” “video” “view” free text

Extended Domain: “figure” “table (non-digital)”
Extended Elements

The following are the production rules for how the extended elements fit within the hierarchical structure of the Content Standard for Digital Geospatial Metadata.

Identification_Information =

Citation +

Description +

Time_Period_of_Content +

Status +

0{Spatial_Domain}1 +

Keywords +

0{Taxonomy}1 +

Access_Constraints +

Use_Constraints +

(Point_of_Contact) +

(1{Browse_Graphic}n) +

(Data_Set_Credit) +

(Security_Information) +

(Native_Data_Set_Environment) +

(1{Cross_Reference}n) +

0{Analytical_Tool}n

Spatial_Domain =

Description_of_Geographic_Extent +

Bounding_Coordinates +

(1{Data_Set_G_Polygon}n)
Taxonomy =
1(Taxonomic_Keywords)n +

Taxonomic_Coverage =

[1{Specific_Taxonomic_Information}n |
General_Taxonomic_Coverage | 1{Specific_Taxonomic_Information}n +
General_Taxonomic_Coverage]

Specific_Taxonomic_Information =
0{Kingdom}1 +
0{Division-Phylum}1 +
0{Class}1 +
0{Order}1 +
0{Family}1 +
0{Genus}1 +
0{Species}1 + (Applicable_Common_Names)

Analytical_Tool =
Analytical_Tool_Description +
Tool_Access_Information +
(Tool_Contact) +
(Tool_Citation)
Tool_Access_Information =

\[0\{\text{Tool\_Network\_Resource\_Name}\}n + \]

\[\text{Tool\_Access\_Instructions} + \]

\[(\text{Tool\_Computer\_and\_Operating\_System})\]

Tool.Contact =

\[\text{Contact\_Information}\]

Tool.Citation =

\[\text{Citation\_Information}\]

Data.Quality Information =

\[0\{\text{Attribute\_Accuracy}\}1 + \]

\[0\{\text{Logical\_Consistency\_Report}\}1 + \]

\[\text{Completeness\_Report} + \]

\[0\{\text{Positional\_Accuracy}\}1 + \]

\[\text{Lineage} + \]

\[(\text{Cloud\_Cover}) + \]

\[0\{\text{Taxonomic\_System}\}1\]

Lineage =

\[0\{\text{Methodology}\}n + \]

\[0\{\text{Source\_Information}\}n + \]

\[1\{\text{Process\_Step}\}n\]

Methodology =
Methodology_Type +

(Methodology_Identifier) +

Methodology_Description +

0{Methodology_Citation}n

Methodology_Identifier =

1{Methodology_Keyword_Thesaurus +

1{Methodology_Keyword}n}n

Methodology_Citation =

Citation_Information

Taxonomic_System =

1{Classification_System_or_Authority}n +

0{Identification_Reference}n +

(1{Identifier})n +

Taxonomic_Procedures +

0{Taxonomic_Completeness}1 +

0{Vouchers}n

Classification_System_or_Authority =

Classification_System_Citation +

0{Classification_System_Modifications}1

Classification_System_Citation =

Citation_Information
Identification_Reference = Citation_Information

Identifier = Contact_information

Vouchers = Specimen + Repository

Repository = Contact_Information
Extension Information:

Name: Description_of_Geographic_Extent
Short_Name: descgeog
z3950 tag: 4112
Type: text
Domain: free text
Parent: Spatial_Domain
Optionality: Mandatory
Repeatability: =1

Definition:

Short description of the geographic areal domain of the data set. Examples include, "Manistee River watershed", "extent of 7 1/2 minute quads containing any property belonging to Yellowstone National Park", or "ponds and reservoirs larger than 2 acres in Jefferson County, Colorado". This is especially important when the extent of the data set is not well described by the "Bounding_Rectangle_Coordinates".

Rationale:

This description is especially important when the extent of the data set is not well described by the "Bounding_Rectangle_Coordinates", or in the case of data which is not specifically geospatial, to provide a geographic setting for the item being documented. Assuming the "Bounding_Rectangle_Coordinates" do not adequately describe the extent of the data set, the discrepancy can be identified and described in this data element. If the item being documented is not specifically geospatial, the "Bounding_Rectangle_Coordinates" can define a general polygon, such as a rectangle around a country, with this "Description_of_Geographic_Extent" element containing a disclaimer concerning the "Bounding_Rectangle_Coordinates" and/or further detail concerning the geographic area of concern for the item being documented. For
example, a study of the diseases of salmon may not have a specific geographic extent
associated with it, but the salmon involved in the study were collected in Washington
and Oregon states, thus the "Bounding_Rectangle_Coordinates" might form a general
rectangle around the states of Washington and Oregon, but the
"Description_of_Geographic_Extent" might describe the fact that the extent within
Washington and Oregon included only certain rivers within those states.

This data element differs from the standard data element "Place_Keyword" in that it
allows a free text description of the geographic extent, rather than just a list of words or
phrases useful as an index of location names associated with the data set.

Source:
National Biological Information Infrastructure (NBII), USGS Biological
Resources Division, FGDC Biological Data Working Group

Extension_Information:
Name: Taxonomy
Short_Name: taxonomy
z3950 tag: 4001
Type: compound
Child: Taxonomic_Keywords
Child: Taxonomic_Coverage
Rule: Taxonomy =
1(Taxonomic_Keywords)n +
Taxonomic_Coverage
Parent: Identification_Information
Optionality: Mandatory-if-applicable
Repeatability: =0 or =1

Definition:

Information on the taxa (1 or more) included in the data set, including keywords, and taxonomic coverage information.

Rationale:

To provide for better documentation of taxonomic coverage or inclusion.

Source:

National Biological Information Infrastructure (NBII), USGS Biological Resources Division, FGDC Biological Data Working Group

Extension_Information:

Name: Taxonomic_Keywords

Short_Name: taxonkey

z3950 tag: 4002

Type: text

Domain:

"collection" "multiple species" "single species" "amphibians" "animals" "bacteria"

"fungi" "invertebrates" "lichens" "mammals" "mosses" "plants" "protists" "reptiles"

"vegetation" "vertebrates" "viruses" free text

Parent: Taxonomy

Optionality: Mandatory

Repeatability: >= 1

Definition:

Common-use words or phrases describing the taxonomy covered by the data set.

Rationale:
To provide general keywords for searching, and the beginning of a "pick list" to allow
users to identify data sets potentially addressing taxa of interest.

Source:
National Biological Information Infrastructure (NBII), USGS Biological Resources Division, FGDC Biological Data Working Group

Extension Information:

Name: Taxonomic_Coverage
Short_Name: taxoncov
z3950 tag: 4003
Type: compound
Child: Specific_Taxonomic_Information
Child: General_Taxonomic_Coverage

Rule: Taxonomic_Coverage =
[1{Specific_Taxonomic_Information}n | General_Taxonomic_Coverage | 1{Specific_Taxonomic_Information}n + General_Taxonomic_Coverage]

Parent: Taxonomy
Optionality: Mandatory
Repeatability: =1

Definition:
Information about the range of taxa addressed in the data set or collection. It is
recommended that one provide information to a level which reflects the data set or
collection being documented. For example, if the data set deals with one or two species,
then all data elements of the "Specific Taxonomic Information" compound element can
be provided and nothing need be entered in the "General Taxonomic Coverage" data
element. If the data set pertains to many species, then if possible, provide the "Specific
Taxonomic Information" to an appropriate level such as order or family, and/or provide
a description of the Taxa included in the data set in the "General Taxonomic Coverage"
data element.

Rationale:
To provide the capability to describe precisely the taxa addressed in the data set or
collection. This can be accomplished using either the Specific_Taxonomic_Information
compound element, to specify from Kingdom down to the appropriate taxonomic level,
or through a free text description within the General_Taxonomic_Coverage data
element, or both.

Source:
National Biological Information Infrastructure (NBII), USGS Biological Resources
Division, FGDC Biological Data Working Group

Extension_Information:
Name: Specific_Taxonomic_Information
Short_Name: taxoninf
z3950 tag: 4004
Type: compound
Child: Kingdom
Child: Division-Phylum
Child: Class
Child: Order
Child: Family
Child: Genus
Child: Species

Child: Applicable_Common_Names

Rule: Specific_Taxonomic_Information =

0{Kingdom}1 +
0{Division-Phylum}1 +
0{Class}1 +
0{Order}1 +
0{Family}1 +
0{Genus}1 +
0{Species}1 +
(Applicable_Common_Names)

Parent: Taxonomic_Coverage

Optionality: Mandatory

Repeatability: >=1

Definition:

Specification of the taxa addressed in the data set or collection.

Rationale:

To provide the capability to document the taxa addressed in the data set or collection via the specification of Kingdom down to the appropriate taxonomic level. Occasionally a level or levels may be left out, or filled with "unknown", due to the newness or revision of the taxonomic classification of an organism.

Source:

National Biological Information Infrastructure (NBII), USGS Biological Resources Division, FGDC Biological Data Working Group

Extension_Information:

Name: Kingdom
Short_Name: kingdom

z3950 tag: 4005

Type: text

Domain:

"Animalia" "Monera" "Protista" "Plantae" "Fungi" "unknown" free text

Parent: Specific_Taxonomic_Information

Optionality: Mandatory-if-applicable

Repeatability: =0 or =1

Definition: Specification of the Kingdom name.

Rationale:

Source:

National Biological Information Infrastructure (NBII), USGS Biological Resources

Division, FGDC Biological Data Working Group

Extension_Information:

Name: Division-Phylum

Short_Name: phylum

z3950 tag: 4006

Type: text

Domain:

(From the Integrated Taxonomic Information System (ITIS)) "unknown" free text

Parent: Specific_Taxonomic_Information

Optionality: Mandatory-if-applicable

Repeatability: =0 or =1

Definition: Specification of the Division / Phylum name.

Rationale:
Source:

National Biological Information Infrastructure (NBII), USGS Biological Resources Division, FGDC Biological Data Working Group

Extension Information:

Name: Class
Short_Name: class
z3950 tag: 4007
Type: text
Domain:

(From the Integrated Taxonomic Information System (ITIS)) "unknown" free text

Parent: Specific_Taxonomic_Information
Optionality: Mandatory-if-applicable
Repeatability: =0 or =1
Definition: Specification of the Class name.
Rationale:
Source:

National Biological Information Infrastructure (NBII), USGS Biological Resources Division, FGDC Biological Data Working Group

Extension Information:

Name: Order
Short_Name: order
z3950 tag: 4008
Type: text
Domain:
(From the Integrated Taxonomic Information System (ITIS)) "unknown" free text

Parent: Specific_Taxonomic_Information

Optionality: Mandatory-if-applicable

Repeatability: =0 or =1

Definition: Specification of the Order name.

Rationale:

Source:
National Biological Information Infrastructure (NBII), USGS Biological Resources Division, FGDC Biological Data Working Group

Extension_Information:

Name: Family

Short_Name: family

z3950 tag: 4009

Type: text

Domain:
(From the Integrated Taxonomic Information System (ITIS)) "unknown" free text

Parent: Specific_Taxonomic_Information

Optionality: Mandatory-if-applicable

Repeatability: =0 or =1

Definition: Specification of the Family name.

Rationale:

Source:
National Biological Information Infrastructure (NBII), USGS Biological Resources Division, FGDC Biological Data Working Group
ExtensionInformation:

Name: Genus
Short_Name: genus
z3950 tag: 4010
Type: text
Domain:
(From the Integrated Taxonomic Information System (ITIS)) "unknown" free text
Parent: Specific_Taxonomic_Information
Optionality: Mandatory-if-applicable
Repeatability: =0 or =1
Definition: Specification of the Genus name.
Rationale:
Source:
National Biological Information Infrastructure (NBII), USGS Biological Resources Division, FGDC Biological Data Working Group

ExtensionInformation:

Name: Species
Short_Name: species
z3950 tag: 4011
Type: text
Domain:
(From the Integrated Taxonomic Information System (ITIS)) "unknown" free text
Parent: Specific_Taxonomic_Information
Optionality: Mandatory-if-applicable
Repeatability: =0 or =1

Definition:

Specification of the Species name, including subspecies, variety name, and author citation (with date as appropriate).

Rationale:

Source:

National Biological Information Infrastructure (NBII), USGS Biological Resources Division, FGDC Biological Data Working Group

Extension_Information:

Name: Applicable_Common_Names

Short_Name: common

z3950 tag: 4012

Type: text

Domain: free text

Parent: Specific_Taxonomic_Information

Optionality: Optional

Repeatability: =1

Definition:

Specification of applicable common names. These common names may be general descriptions of a group of organisms if appropriate (e.g. insects, vertebrate, grasses, waterfowl, vascular plants, etc.)

Rationale:

Source:

National Biological Information Infrastructure (NBII), USGS Biological Resources Division, FGDC Biological Data Working Group
Extension Information:

Name: General_Taxonomic_Coverage
Short_Name: taxongen
z3950 tag: 4105
Type: text
Domain: free text
Parent: Taxonomic_Coverage
Optionality: Mandatory (and/or Specific_Taxonomic_Information)
Repeatability: =1
Definition:

A description of the range of taxa addressed in the data set or collection. For example, all vascular plants were identified to family or species, mosses and lichens were identified as moss or lichen.

Rationale:

To provide the capability to document the taxa addressed in the data set or collection via a free text description. This is especially important with data sets or collections which would not be easily described using the Specific_Taxonomic_Information compound element.

Source:

National Biological Information Infrastructure (NBII), USGS Biological Resources Division, FGDC Biological Data Working Group

Extension Information:

Name: Analytical_Tool
Short_Name: tool
z3950 tag: 4013
Type: compound

Child: Analytical_Tool_Description

Child: Tool_Access_Information

Child: Tool_Contact

Child: Tool_Citation

Parent: Identification_Information

Optionality: Mandatory-if-applicable

Repeatability: >=1

Definition:

Tools, models, or statistical procedures that the data set is intrinsically bound to and are available for use in analyzing the data set. Examples include reconstructions of phylogenies, population viability analyses, community ordinations, most atmospheric and hydrological transport analyses, and inferences on the effects of climate change on forest composition and productivity. Enough information should be included such that a potential data user can easily determine why they might wish to acquire the analytical tool, and the methodology to acquire it.

Rationale:

Some biological data sets are intrinsically bound to models or statistical procedures used to generate them. In these cases, a description of the analyses and contact, citation, and access information for the tools used are needed to properly interpret the data.

Source:

National Biological Information Infrastructure (NBII), USGS Biological Resources Division, FGDC Biological Data Working Group

Extension_Information:

Name: Analytical_Tool_Description
Short_Name: tooldesc

z3950 tag: 4014

Type: text

Domain: free text

Parent: Analytical_Tool

Optionality: Mandatory

Repeatability: =1

Definition:

Description of the analytical tool, model, or statistical procedure.

Rationale:

Source:

National Biological Information Infrastructure (NBII), USGS Biological Resources

Division, FGDC Biological Data Working Group

Extension_Information:

Name: Tool_Access_Information

Short_Name: toolacc

z3950 tag: 4015

Type: compound

Child: Tool_Network_Resource_Name

Child: Tool_Access_Instructions

Child: Tool_Computer_and_Operating_System

Parent: Analytical_Tool

Optionality: Mandatory

Repeatability: =1

Definition:
Information on the steps required to access the tool.

Rationale:

Source:

National Biological Information Infrastructure (NBII), USGS Biological Resources Division, FGDC Biological Data Working Group

Extension_Information:

Name: Tool_Contact
Short_Name: toolcont
z3950 tag: 4016
Type: compound
Child: Contact_Information
Parent: Analytical_Tool
Optionality: Optional
Repeatability: =1
Definition:
The party from whom the tool, model, or statistical procedure may be obtained.

Rationale:

Source:

National Biological Information Infrastructure (NBII), USGS Biological Resources Division, FGDC Biological Data Working Group

Extension_Information:

Name: Tool_Citation
Short_Name: toolcite
z3950 tag: 4017
Type: compound

Child: Citation Information

Parent: Analytical Tool

Optionality: Optional

Repeatability: =1

Definition:

Citation information about the tool, model, or statistical procedure.

Rationale:

Source:

National Biological Information Infrastructure (NBII), USGS Biological Resources Division, FGDC Biological Data Working Group

Extension Information:

Name: Tool_Network_Resource_Name

Short_Name: toolnet

z3950 tag: 4018

Type: text

Domain: free text

Parent: Tool Access Information

Optionality: Mandatory-if-applicable

Repeatability: >=0

Definition:

The electronic address and name of the file or service from which the tool, model, or statistical procedure can be obtained.

Rationale:

Source:
Instructions on the steps required to access the tool, model, or statistical procedure.

Rationale:

Source:

National Biological Information Infrastructure (NBII), USGS Biological Resources
Division, FGDC Biological Data Working Group

Name: Tool_Computer_and_Operating_System
Short_Name: toolcomp
z3950 tag: 4020
Type: text
Domain: free text
Parent: Tool_Access_Information
Optionality: Optional

Repeatability: =1

Definition:

The brand of computer and its operating system that the tool, model, or statistical procedure requires.

Rationale:

Source:

National Biological Information Infrastructure (NBII), USGS Biological Resources Division, FGDC Biological Data Working Group

Extension Information:

Name: Methodology
Short_Name: method
z3950 tag: 4021
Type: compound
Child: Methodology_Type
Child: Methodology_Identifier
Child: Methodology_Description
Child: Methodology_Citation
Parent: Lineage
Optionality: Mandatory-if-applicable
Repeatability: >=0
Definition:

Information about a single step of field and/or laboratory work.

Rationale:
This element represents a critical element of the documentation required to interpret important biological data sets.

Source:
National Biological Information Infrastructure (NBII), USGS Biological Resources Division, FGDC Biological Data Working Group

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Extension_Information:

Name: Methodology_Type
Short_Name: methtype
z3950 tag: 4022
Type: text
Domain: "Field" "Lab" free text
Parent: Methodology
Optionality: Mandatory
Repeatability: =1
Definition:
The type of methodology being documented, such as field or laboratory methodology.
Rationale:
This element should set a basic definition for the type of methodology being documented.
Source:
National Biological Information Infrastructure (NBII), USGS Biological Resources Division, FGDC Biological Data Working Group

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Extension_Information:

Name: Methodology_Identifier
Short_Name: methodid

z3950 tag: 4023

Type: compound

Child: Methodology_Keyword_Thesaurus

Child: Methodology_Keyword

Parent: Methodology

Optionality: Optional

Repeatability: >=0

Definition:

Keywords or phrases summarizing the field or laboratory methods used.

Rationale:

Although there are no simple sets of standardized methods for all data collection, for
most classes of data, it should be possible to identify some standard terms describing the
methodology being documented. In some cases, standardized references or thesauri may
exist or may be under creation.

Source:

National Biological Information Infrastructure (NBII), USGS Biological Resources
Division, FGDC Biological Data Working Group

Extension_Information:

Name: Methodology_Keyword_Thesaurus

Short_Name: methkt

z3950 tag: 4024

Type: text

Domain: "None" free text

Parent: Methodology_Identifier
Optionality: Mandatory

Repeatability: =1

Definition:

Reference to a formally registered thesaurus or a similar authoritative source of methodology keywords.

Rationale:

Although there are no simple sets of standardized methods for all data collection, for most classes of data, it should be possible to identify some standard terms describing the methodology being documented. In some cases, standardized references or thesauri may exist or may be under creation.

Source:

National Biological Information Infrastructure (NBII), USGS Biological Resources Division, FGDC Biological Data Working Group

Extension Information:

Name: Methodology_Keyword
Short_Name: methkey
z3950 tag: 4025
Type: text
Domain: free text
Parent: Methodology_Identifier
Optionality: Mandatory
Repeatability: >=1
Definition:

The name of a method used in the field or laboratory work.

Rationale:
Although there are no simple sets of standardized methods for all data collection, for most classes of data, it should be possible to identify some standard terms describing the methodology being documented. In some cases, standardized references or thesauri may exist or may be under creation.

Source:
National Biological Information Infrastructure (NBII), USGS Biological Resources Division, FGDC Biological Data Working Group

Extension Information:
Name: Methodology_Description
Short_Name: methdesc
z3950 tag: 4026
Type: text
Domain: free text
Parent: Methodology
Optionality: Mandatory
Repeatability: 1
Definition:

Equivalent to "Materials and Methods" in a journal article. Describe the physical methods used to gather data, the experimental design, sample frequency, treatments or strata, statistical and spatial design of the sampling, and sample completeness, representativeness, and biases. For example, in a bird survey, relevant elements would include the methods used to detect species occurrences (casual sightings, transects, focal point surveys, vocalizations, mist nets), whether or not evidence of breeding activity was required, descriptions of the habitat strata in a stratified design, and known biases (e.g.,
non-territorial birds were undersampled, and some juveniles could not be identified to species.)

Rationale:

Source:

National Biological Information Infrastructure (NBII), USGS Biological Resources Division, FGDC Biological Data Working Group

Extension Information:

Name: Methodology_Citation
Short_Name: methcite
z3950 tag: 4027
Type: compound
Child: Citation_Information
Parent: Methodology
Optionality: Mandatory-if-applicable
Repeatability: =0 or =1
Definition: Information referencing the methods used.
Rationale:
Source:

National Biological Information Infrastructure (NBII), USGS Biological Resources Division, FGDC Biological Data Working Group

Extension Information:

Name: Taxonomic_System
Short_Name: taxonsys
z3950 tag: 4028
Type: compound

Child: Classification_System_or_Authority

Child: Identification_Reference

Child: Identifier

Child: Taxonomic_Procedures

Child: Taxonomic_Completeness

Child: Vouchers

Parent: Data_Quality_Information

Optionality: Mandatory-if-applicable

Repeatability: =0 or =1

Definition:

Documentation of taxonomic sources, procedures, and treatments.

Rationale:

The set of data elements contained within this compound element represent an attempt to provide better documentation of taxonomic sources, procedures, and treatments as strongly recommended in the American Institute of Biological Sciences Review to the National Biological Service on the Content Standard for Non-Geospatial Metadata Workshop, 1995.

Source:

National Biological Information Infrastructure (NBII), USGS Biological Resources Division, FGDC Biological Data Working Group

Extension_Information:

Name: Classification_System_or_Authority

Short_Name: classsys

z3950 tag: 4029
Type: compound

Child: Classification_System_Citation

Child: Classification_System_Modifications

Parent: Taxonomic_System

Optionality: Mandatory

Repeatability: \( >=1 \)

Definition:

Information about the classification system or authority used.

Rationale:

Together, the classification system and any modifications made to it represent a significant piece of information concerning the data being documented.

Source:

National Biological Information Infrastructure (NBII), USGS Biological Resources Division, FGDC Biological Data Working Group

Extension_Information:

Name: Classification_System_Citation

Short_Name: classcit

z3950 tag: 4030

Type: compound

Child: Citation_Information

Parent: Classification_System_or_Authority

Optionality: Mandatory

Repeatability: =1

Definition:
A citation for the classification system or authority used, this might include monographs (e.g., a regional flora) or on-line data sets (e.g., the USDA PLANTS database), etc.

**Rationale:**
This data element defines the authority used for classifying. When appropriate, the Integrated Taxonomic Information System (ITIS) <URL:http://www.itis.usda.gov/itis/> should be used.

**Source:**
National Biological Information Infrastructure (NBII), USGS Biological Resources Division, FGDC Biological Data Working Group

**Extension Information:**

**Name:** Classification_System_Modifications

**Short_Name:** classmod

**z3950 tag:** 4037

**Type:** text

**Domain:** free text

**Parent:** Classification_System_or_Authority

**Optionality:** Mandatory-if-applicable

**Repeatability:** =0 or =1

**Definition:**
A description of any modifications or exceptions made to the classification system or authority used.

**Rationale:**
Many times a standard system is used, but exceptions are made for specific taxa or groups, this element allows for these exceptions or modifications to be described.

**Source:**
National Biological Information Infrastructure (NBII), USGS Biological Resources
Division, FGDC Biological Data Working Group

Extension Information:

Name: Identification_Reference
Short_Name: idref
z3950 tag: 4031
Type: compound
Child: Citation_Information
Parent: Taxonomic_System
Optionality: Mandatory-if-applicable
Repeatability: >=0
Definition:

Information on any non-authoritative materials (e.g. field guides) useful for
reconstructing the actual identification process.

Rationale:

This information can be useful for someone who wishes to make use of a dataset, and
perhaps expand on it, following similar procedures.

Source:

National Biological Information Infrastructure (NBII), USGS Biological Resources
Division, FGDC Biological Data Working Group

Extension Information:

Name: Identifier
Short_Name: ider
z3950 tag: 4032
Type: compound

Child: Contact_information

Parent: Taxonomic_System

Optionality: Optional

Repeatability: >=0

Definition:

Information about the individual(s) responsible for the identification(s) of the specimens or sightings, etc.

Rationale:

If there are any questions on the identification of specimens or field sightings, this should provide some insight into the data creator.

Source:

National Biological Information Infrastructure (NBII), USGS Biological Resources Division, FGDC Biological Data Working Group

Extension_Information:

Name: Taxonomic_Procedures

Short_Name: taxonpro

z3950 tag: 4035

Type: text

Domain: free text

Parent: Taxonomic_System

Optionality: Mandatory

Repeatability: =1

Definition:
Description of the methods used for the taxonomic identification. Could include specimen processing, comparison with museum materials, keys and key characters, chemical or genetic analyses, etc.

Rationale:
In order to be able to make appropriate use of a biological data set, often it is important to know not just who identified the individuals or specimens, but what process did they used to do so.

Source:
National Biological Information Infrastructure (NBII), USGS Biological Resources Division, FGDC Biological Data Working Group

Extension Information:
Name: Taxonomic_Completeness
Short_Name: taxoncom
z3950 tag: 4036
Type: text
Domain: free text
Parent: Taxonomic_System
Optionality: Mandatory-if-applicable
Repeatability: =0 or =1
Definition:
Information concerning the proportions and treatment of unidentified materials (i.e. materials sent to experts, and not yet determined); estimates of the importance, and identities of misidentifications, uncertain determinations, synonyms or other incorrect usages; taxa not well treated or requiring further work; and expertise of field workers.

Rationale:
Source: National Biological Information Infrastructure (NBII), USGS Biological Resources
Division, FGDC Biological Data Working Group

Extension Information:
Name: Vouchers
Short_Name: vouchers
z3950 tag: 4033
Type: compound
Child: Specimen
Child: Repository
Parent: Taxonomic_System
Optionality: Mandatory-if-applicable
Repeatability: >=0
Definition:
Information on the types of specimen, the repository, and the individuals who identified
the vouchers.

Rationale:
Source:
National Biological Information Infrastructure (NBII), USGS Biological Resources
Division, FGDC Biological Data Working Group

Extension Information:
Name: Specimen
Short_Name: specimen
z3950 tag: 4038
Type: text

Domain:
"herbarium specimens" "blood samples" "photographs" "individuals" free text

Parent: Vouchers
Optionality: Mandatory
Repeatability: =1

Definition:
A word or phrase describing the type of specimen collected (e.g. herbarium specimens,
blood samples, photographs, individuals, or batches).

Rationale:
Source:
National Biological Information Infrastructure (NBII), USGS Biological Resources
Division, FGDC Biological Data Working Group

Extension_Information:
Name: Repository
Short_Name: reposit
z3950 tag: 4034
Type: compound
Child: Contact_Information
Parent: Vouchers
Optionality: Mandatory
Repeatability: =1
Definition:
Information about the curator or contact person and/or agency responsible for the
specimens.
Rationale:

If, for any reason, the specimens should need to be referred to, information about where
they are being housed and who is responsible for them should be kept along with the
documentation of the data set. If they have not been archived, this should be noted.

Source:

National Biological Information Infrastructure (NBII), USGS Biological Resources
Division, FGDC Biological Data Working Group
Appendix A

Glossary

animalia – (animals) Multicellular organisms possessing membrane-bound organelles and nucleus.

Animals are heterotrophs and most are motile. Most animals reproduce via sperm and egg cells.

Phylums within the animalia kingdom include porifera, cnidaria, platyhelminthes, nematoda, mollusca, annelida, arthropoda, echinodermata, and chordata.

biological data – Any communication or representation of biologically related facts or information collected for computation or analysis.

class – The primary subdivision of a taxonomic division or phylum, usually consisting of one or more orders.

division-phylum – The primary subdivision of a taxonomic kingdom consisting of one or more classes of organisms.

family – The major subdivision of a taxonomic order or suborder consisting of one or more genera.

fungi – (fungus) Organisms which are nonmotile, heterotrophic, with membrane-bounded organelles and nucleus. Most fungi reproduce by means of spores, and are unable to perform photosynthesis. The divisions with the fungi kingdom include mycophycota, zygomycota, basidiomycota, ascomycota, and deuteromycota.

genus – The major subdivision of a taxonomic family or subfamily usually consisting of one or more species.

kingdom – One of the taxonomic divisions of living organisms, includes animals (animalia), plants (plantae), protists (protista), fungi (fungi), and (monera).

methodology – A set or system of methods, principles, and rules for a biological inquiry procedure. This includes laboratory, field, data processing and statistical methodologies.

monera – (bacteria, blue-green algae) Organisms lacking a cell nuclei. The divisions within the monera kingdom include archaebacteria and eubacteria.
observed – To make a methodical or scientific record of something. Under “Currentness Reference” and “Source Currentness Reference” “observed” is used if you observed the time of the data collection. Under “Type of Source Media” “visually observed or measured” is used if the source of the data was generated from methodical or scientific observations or measurements.

order – The major subdivision of a taxonomic class or subclass consisting of one or more taxonomic families.

plantae – (plants) Multicellular organisms that perform photosynthesis to obtain their nutrition. Plants all possess chloroplasts and have distinct cell walls made of cellulose. The divisions with the plantae kingdom include bryophytes, gymnosperms, angiosperms, and sphenophyta.

protista – (amoeba, euglena, paramecium, diatom, slime molds) The kingdom of protists consists of generally unicellular organisms possessing membrane-bound organelles and nucleus. The divisions within the protista kingdom include autotrophs and heterotrophs.

species – The major subdivision of a genus or subgenus, regarded as the basic category of biological classification, composed of related individuals that resemble one another and are able to breed among themselves, but are generally not able to breed with members of another species.

taxa – Taxonomic categories, such as species and genus.

taxonomy – The science or technique of describing, identifying, naming, and classifying living organisms.
Appendix B

Index

(Note: This index is subject to major revision, as the document is currently double spaced, and will be single spaced upon final publication, thus the location of the element names will change.)

<table>
<thead>
<tr>
<th>Name</th>
<th>Production Rules</th>
<th>Extended Element Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analytical_Tool</td>
<td>11</td>
<td>29</td>
</tr>
<tr>
<td>Analytical_Tool_Description</td>
<td>11</td>
<td>31</td>
</tr>
<tr>
<td>Applicable_Common_Names</td>
<td>11</td>
<td>28</td>
</tr>
<tr>
<td>Class</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classification_System_Citation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classification_System_Modifications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classification_System_or_Authority</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description_of_Geographic_Extent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Division-Phylum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General_Taxonomic_Coverage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Genus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identification_Reference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identifier</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kingdom</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methodology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methodology_Citation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methodology_Description</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methodology_Identifier</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methodology_Keyword</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1232  Methodology.Keyword_Thesaurus
1233  Methodology_Type
1234  Order
1235  Repository
1236  Species
1237  Specimen
1238  Specific_Taxonomic_Information
1239  Taxonomy
1240  Taxonomic_Completeness
1241  Taxonomic_Coverage
1242  Taxonomic_Keywords
1243  Taxonomic_Procedures
1244  Taxonomic_System
1245  Tool_Access_Information
1246  Tool_Access_Instructions
1247  Tool_Citation
1248  Tool_Computer_and_Operating_System
1249  Tool_Contact
1250  Tool_Network_Resource_Name
1251  Vouchers
Appendix C

References


