

# Diversifying the data model - Webinar 2

## Exploring Collection Management Systems

John Wieczorek and Tim Robertson  
GBIF Secretariat



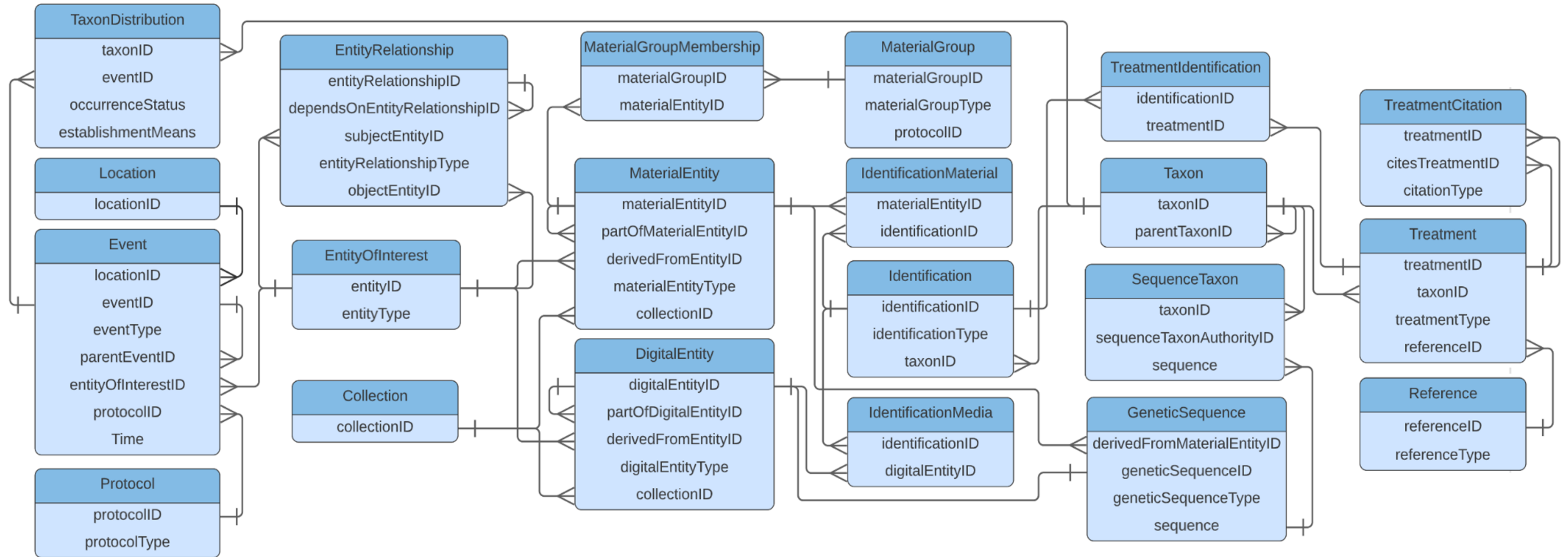
**GBIF**

Global Biodiversity  
Information Facility

7th July 2022

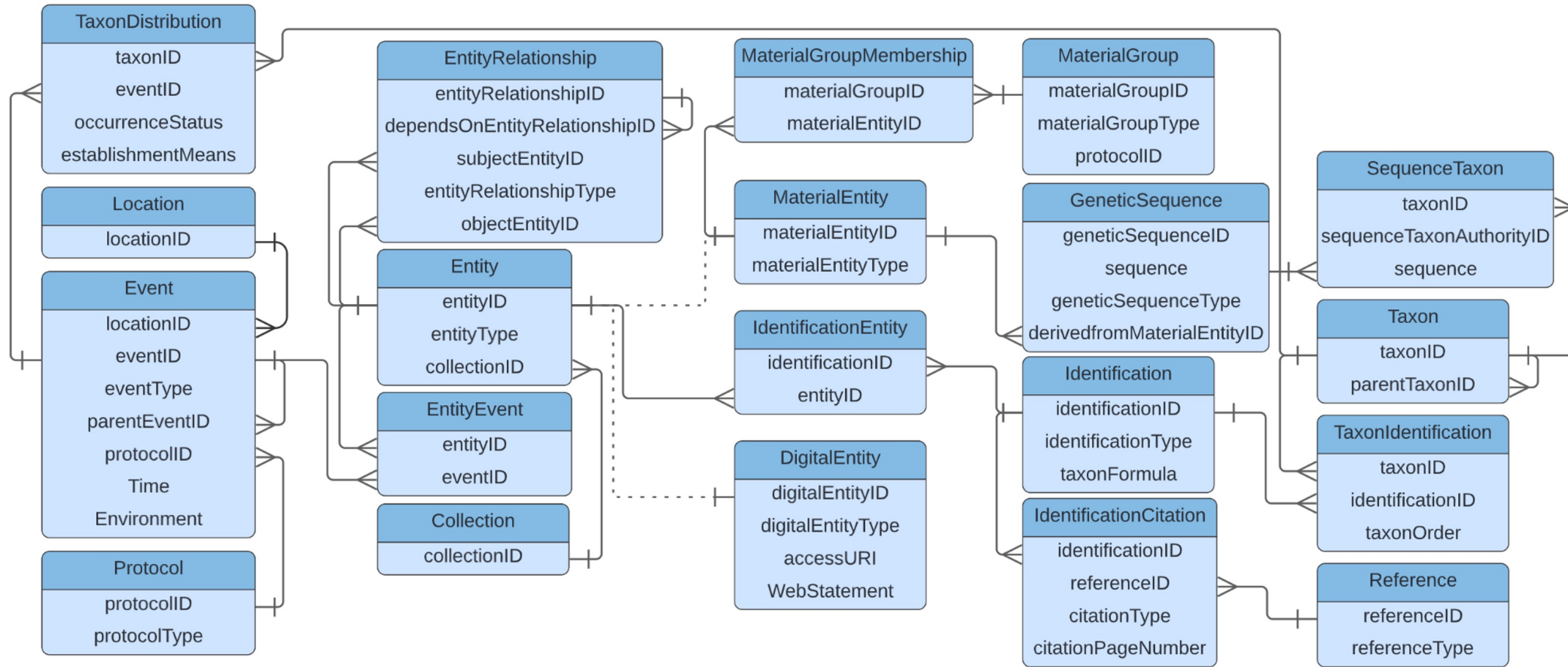


# GBIF Unified Model 2022-04



Diversifying the GBIF Data Model: <https://tinyurl.com/diversifying-gbif-data>  
<https://tinyurl.com/diversifying-gbif-webinar1>

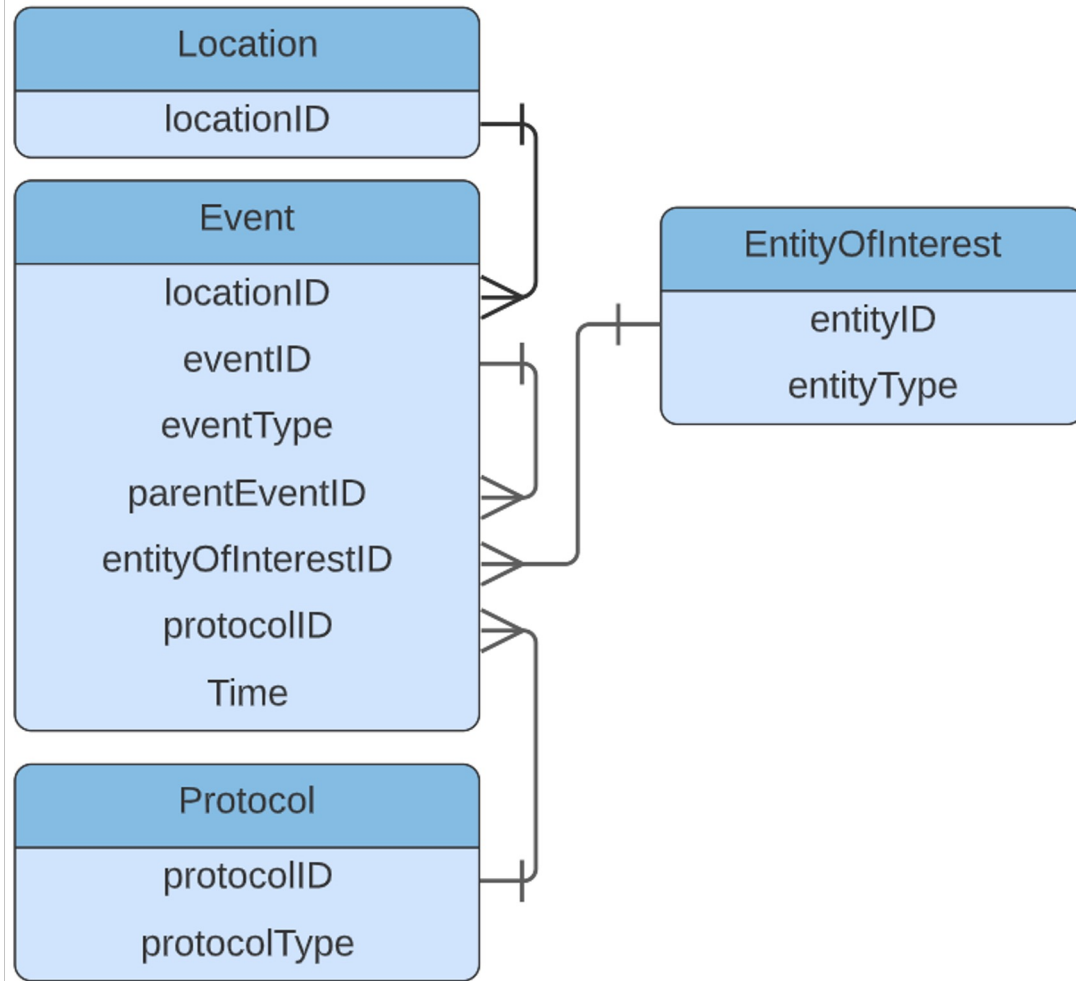
# GBIF Unified Model 2022-07



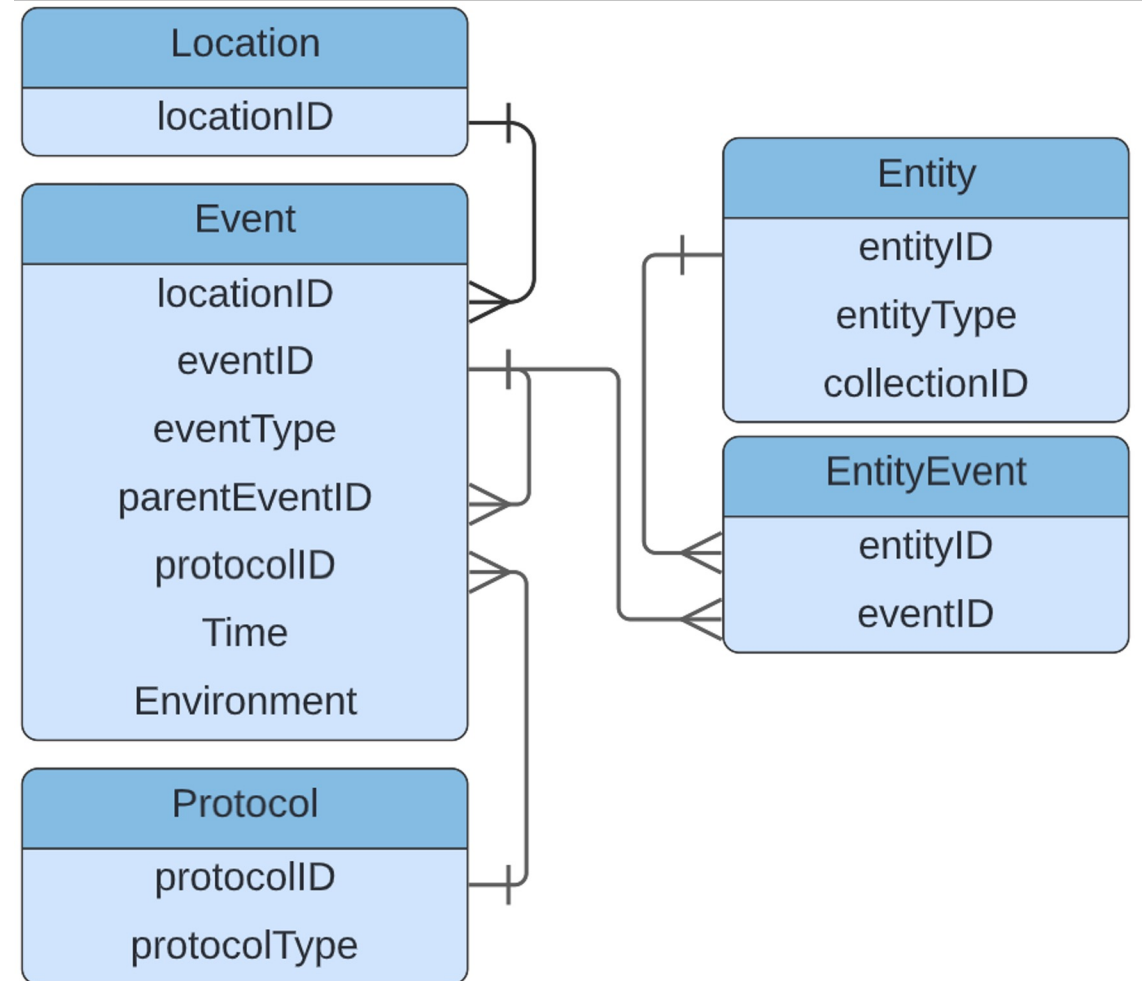
Diversifying the GBIF Data Model: <https://tinyurl.com/diversifying-gbif-data>

# Events in the Unified Model

2022-04



2022-07

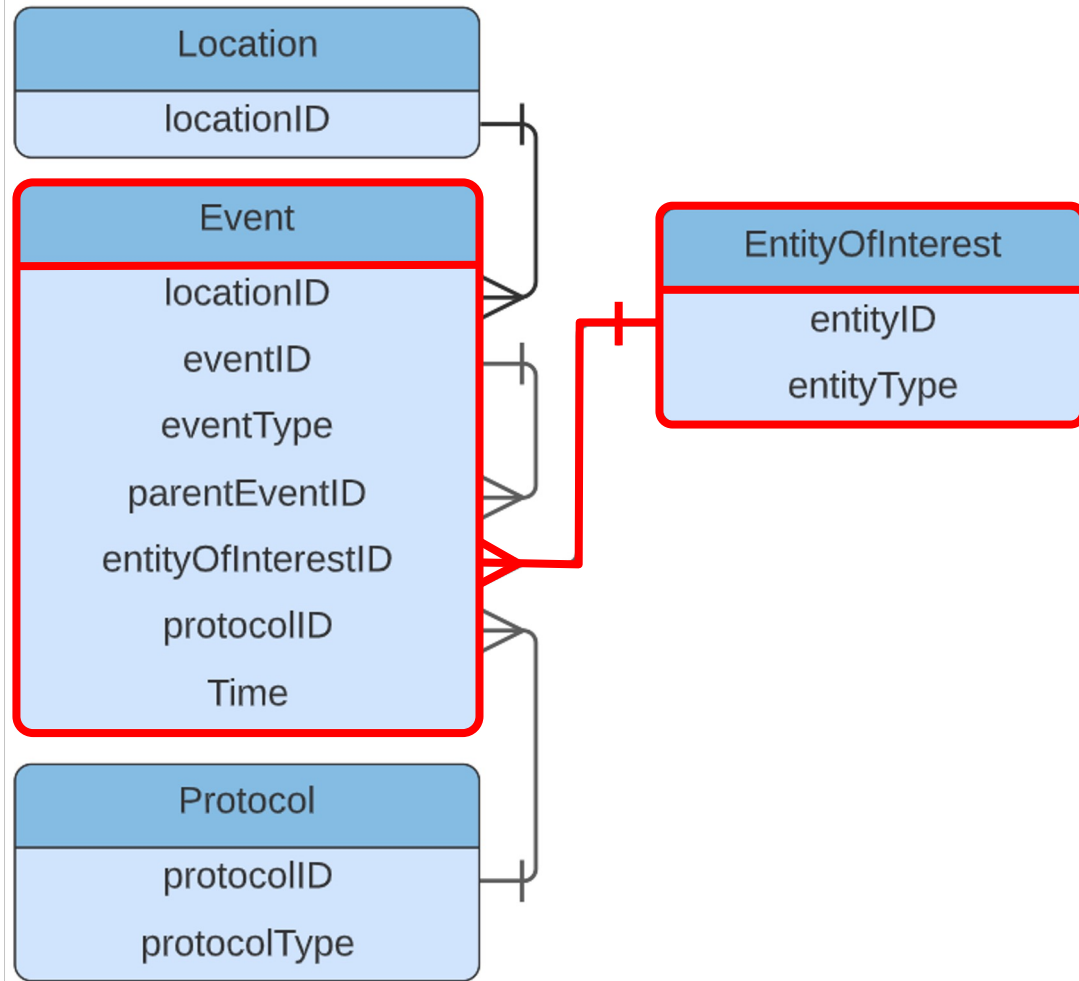


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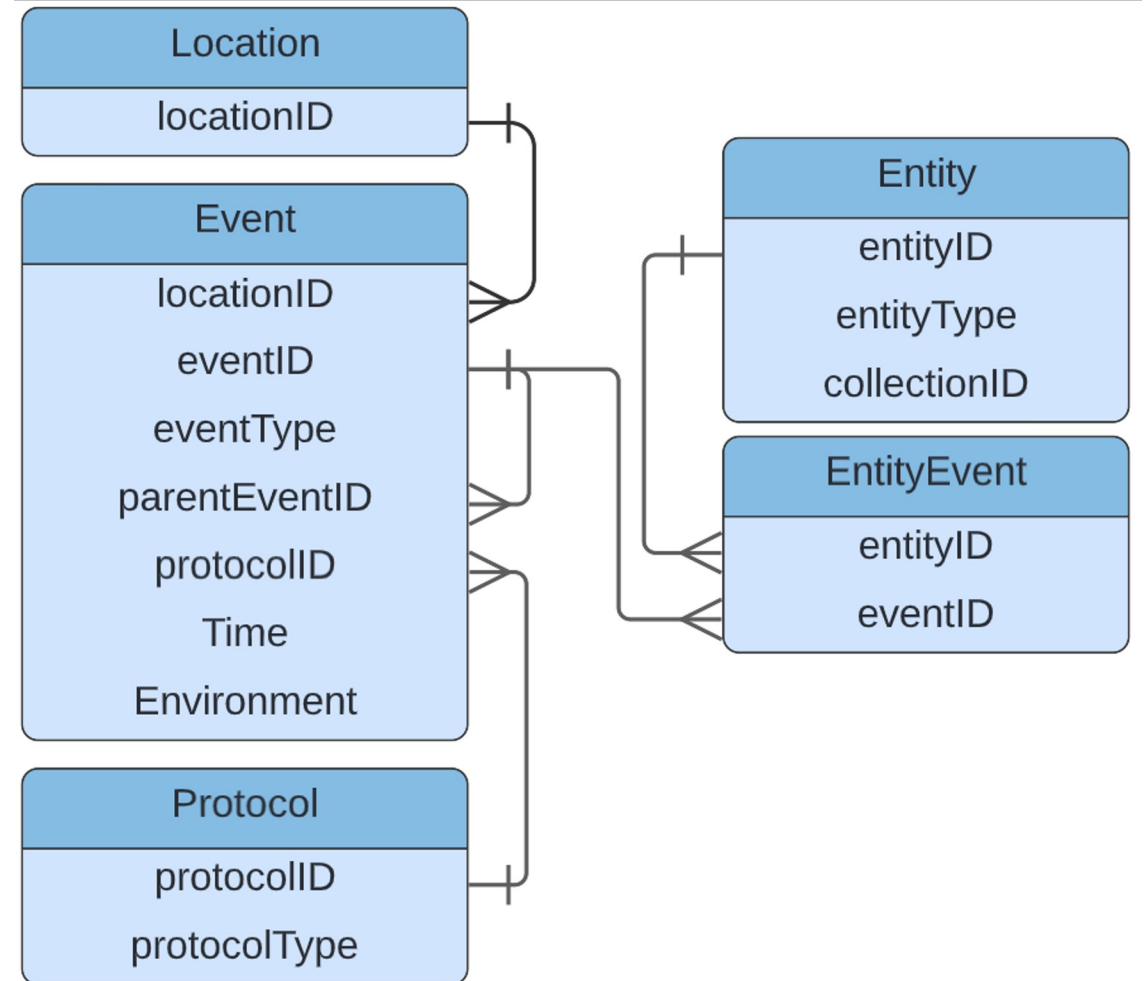


# Events in the Unified Model

2022-04



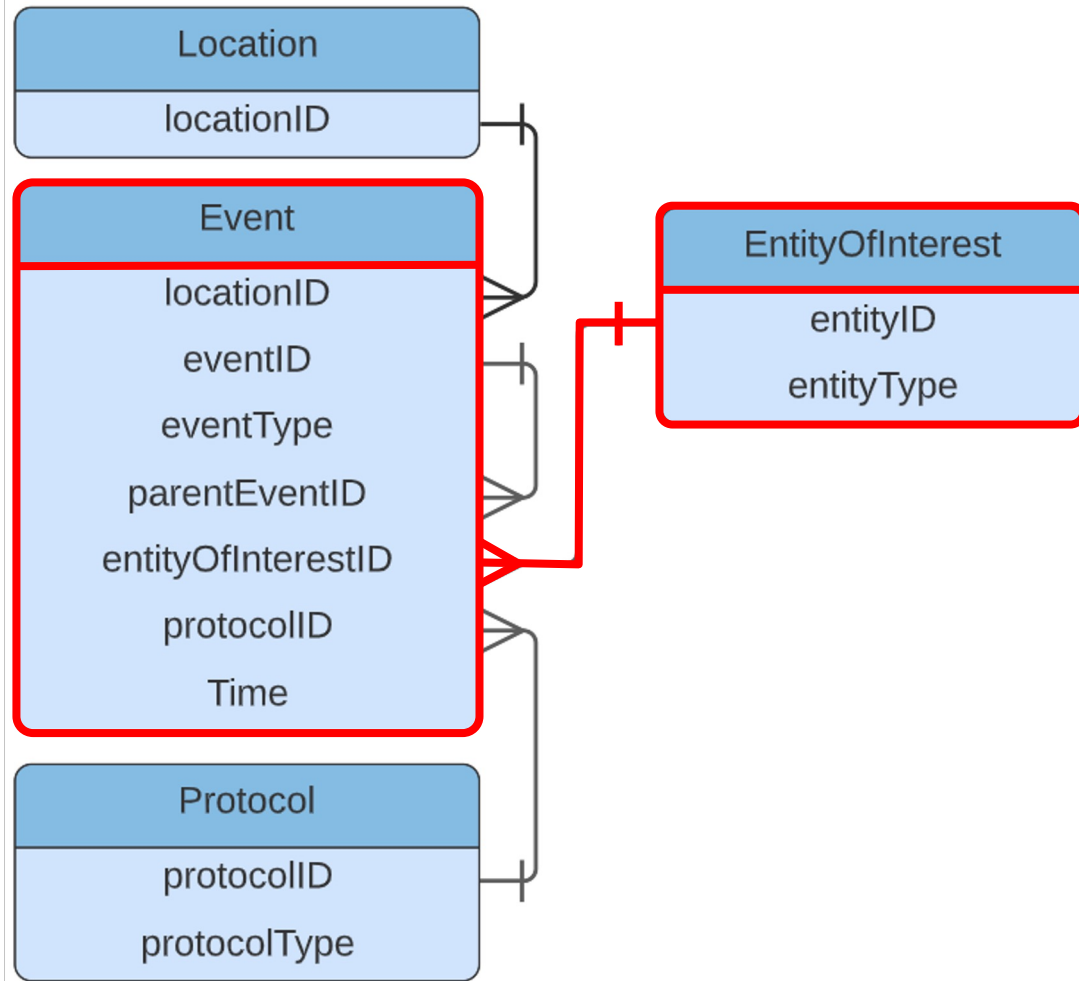
2022-07



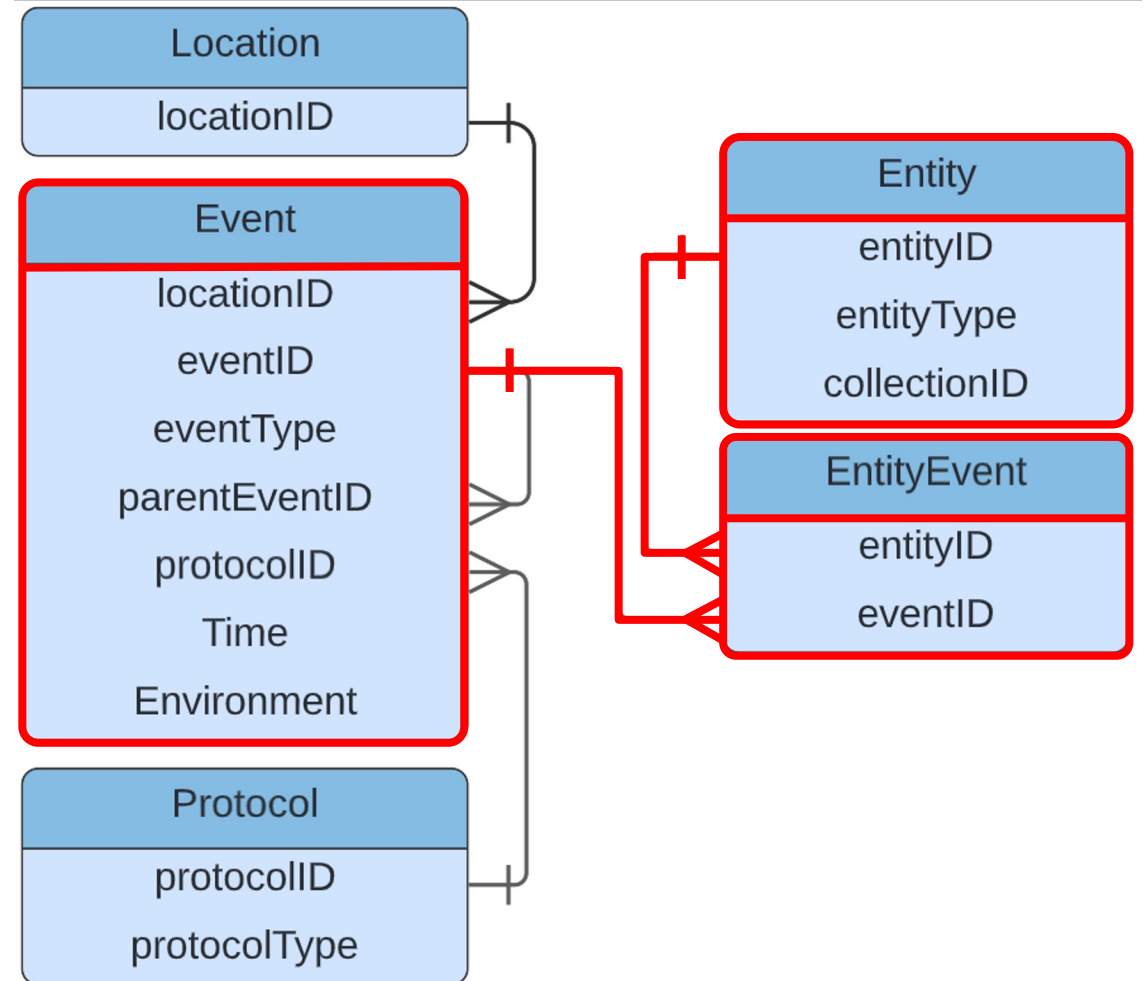
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# Events in the Unified Model

2022-04



2022-07

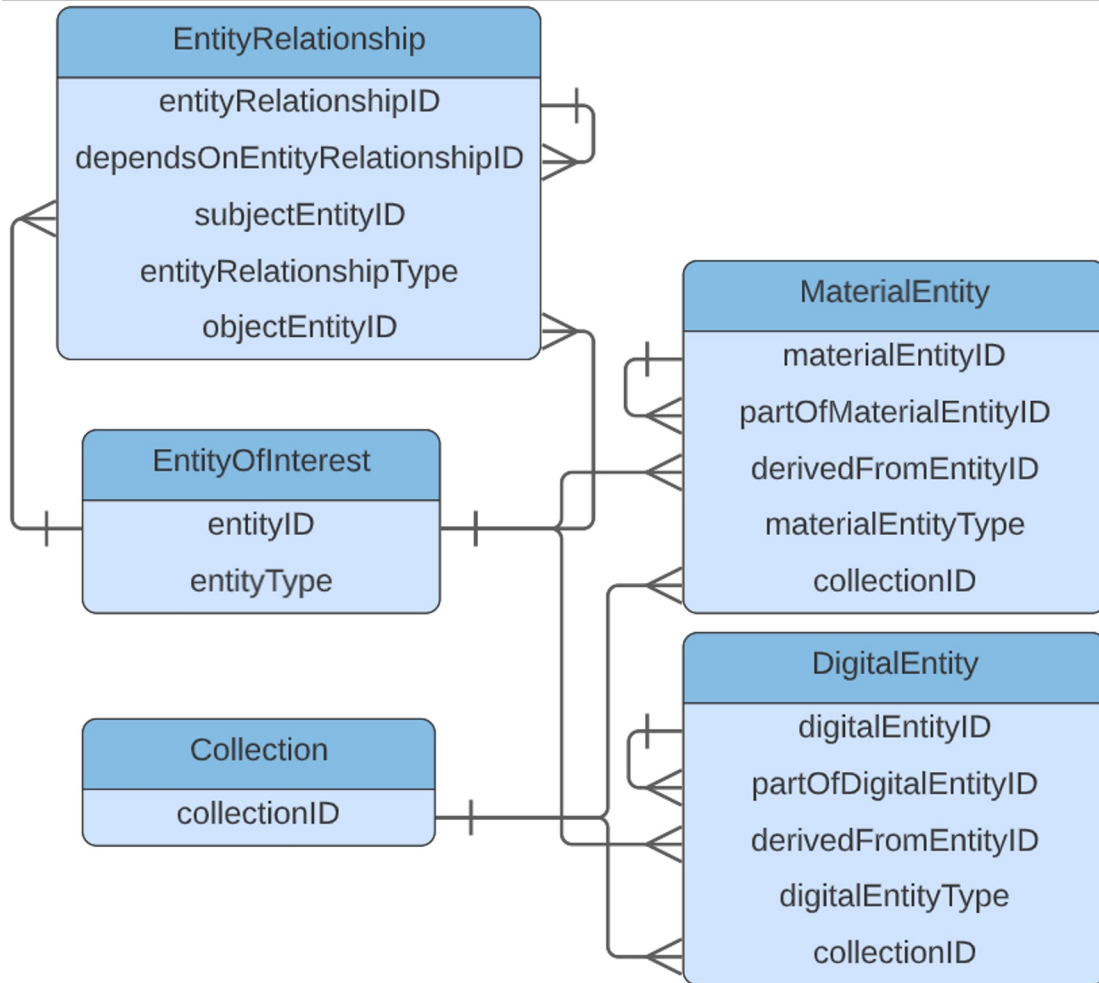


Diversifying the GBIF Data Model: <https://tinyurl.com/diversifying-gbif-data>

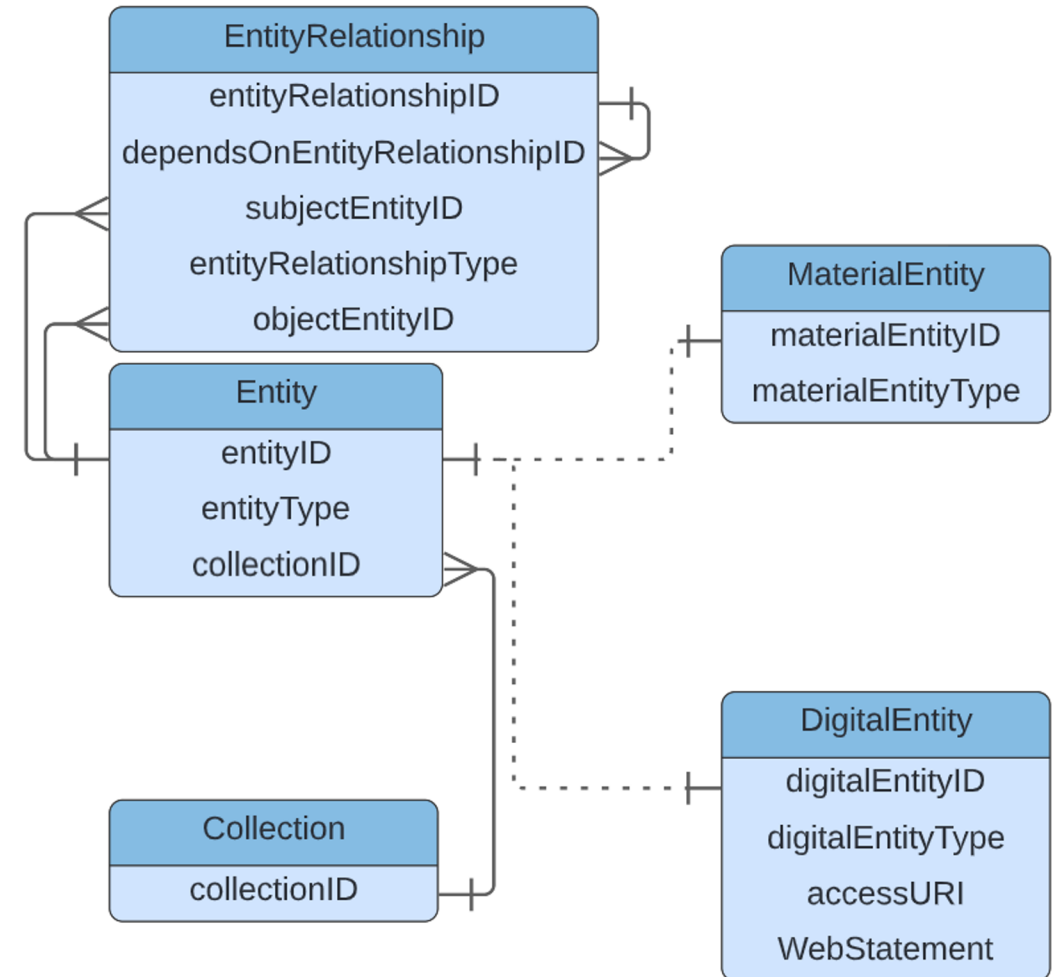


# Entities in the Unified Model

2022-04



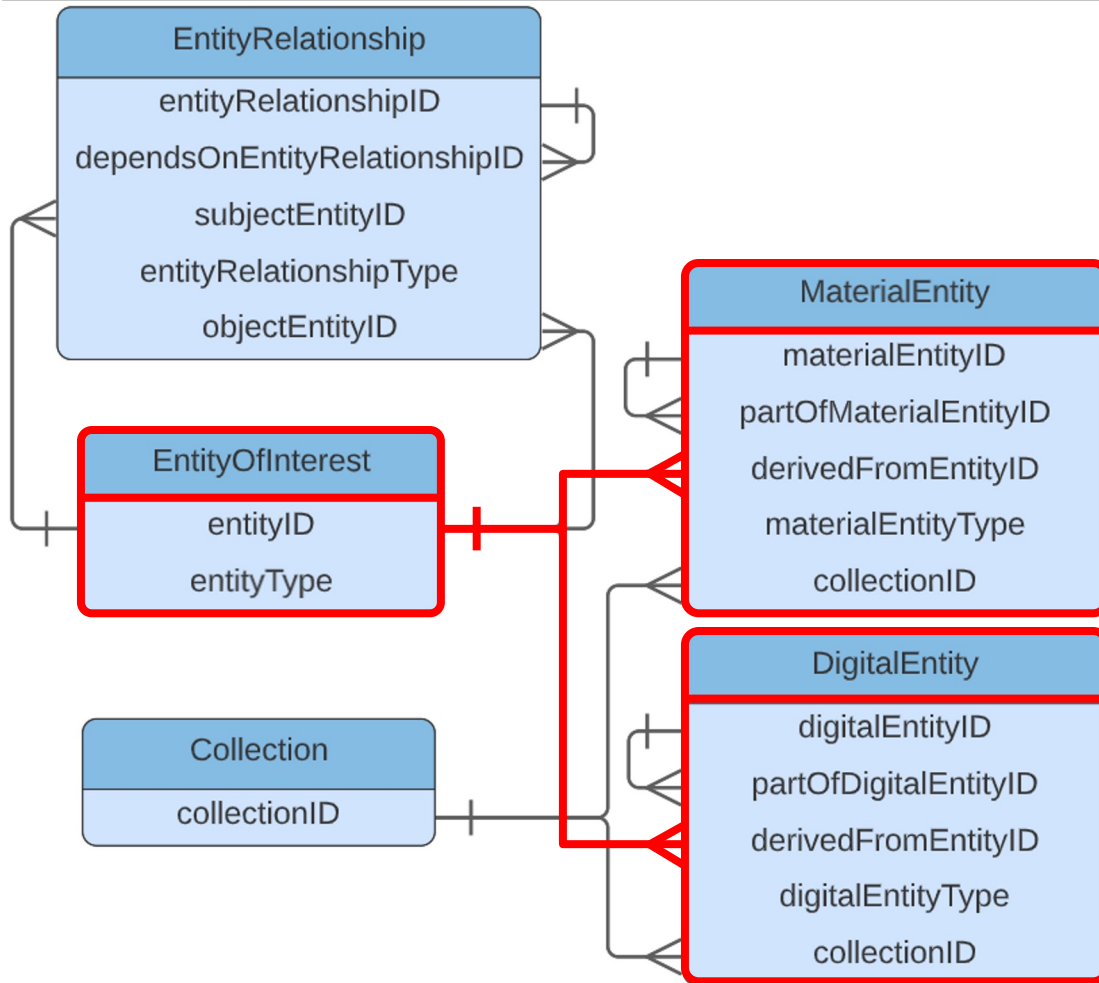
2022-07



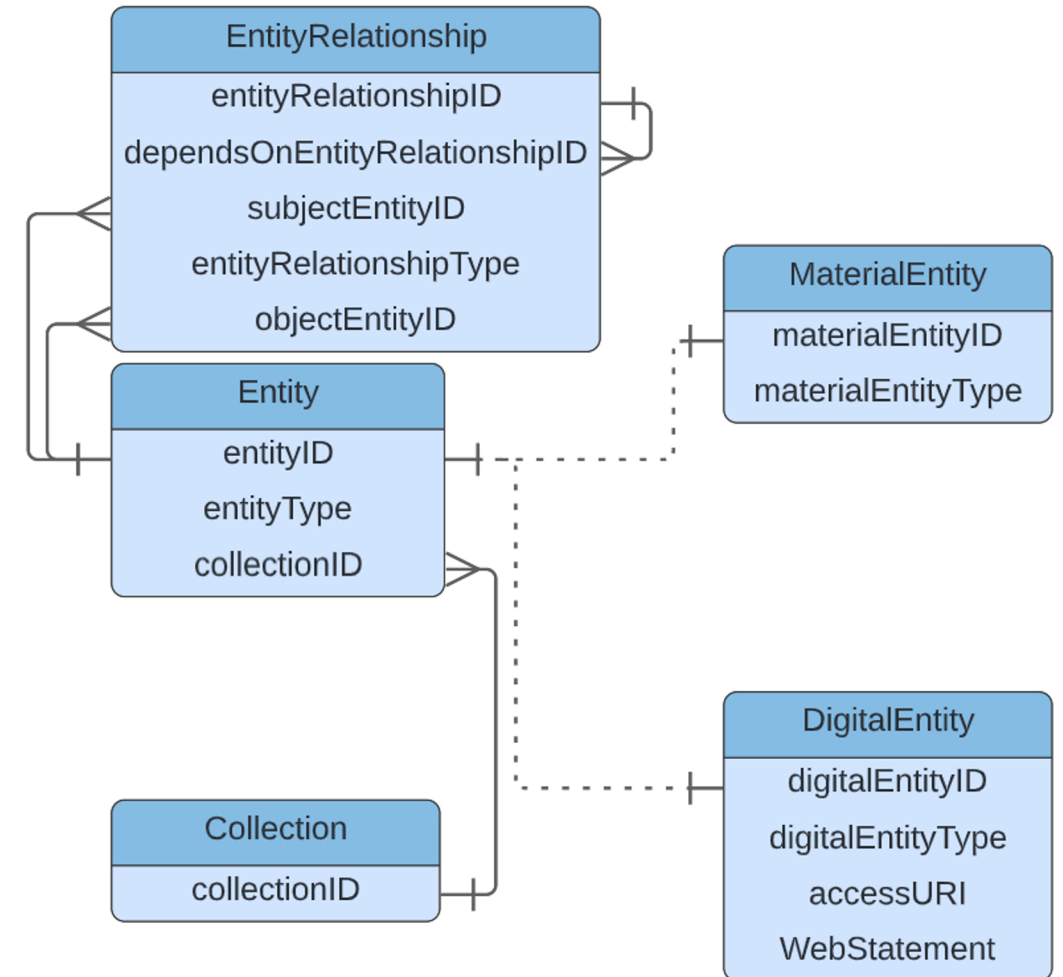
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2022-04



2022-07

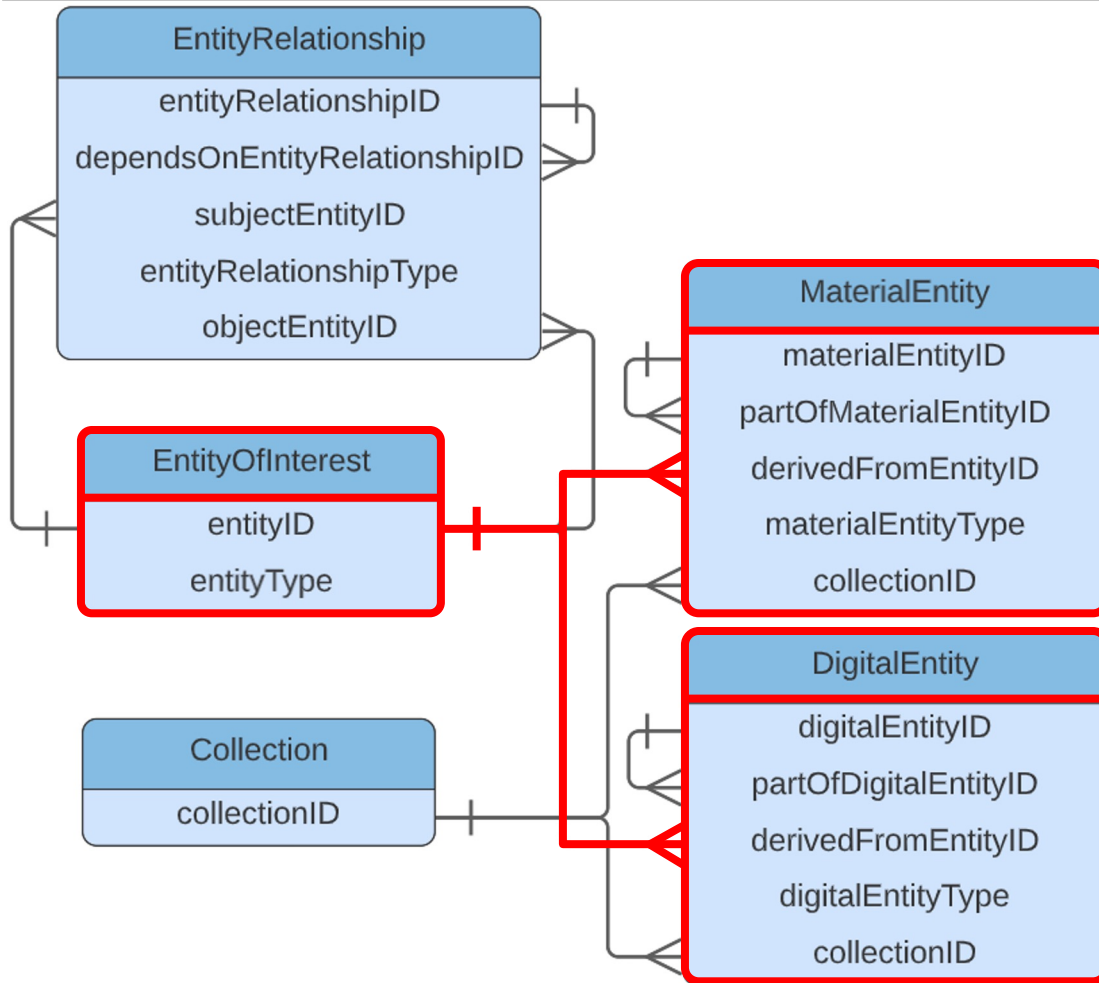


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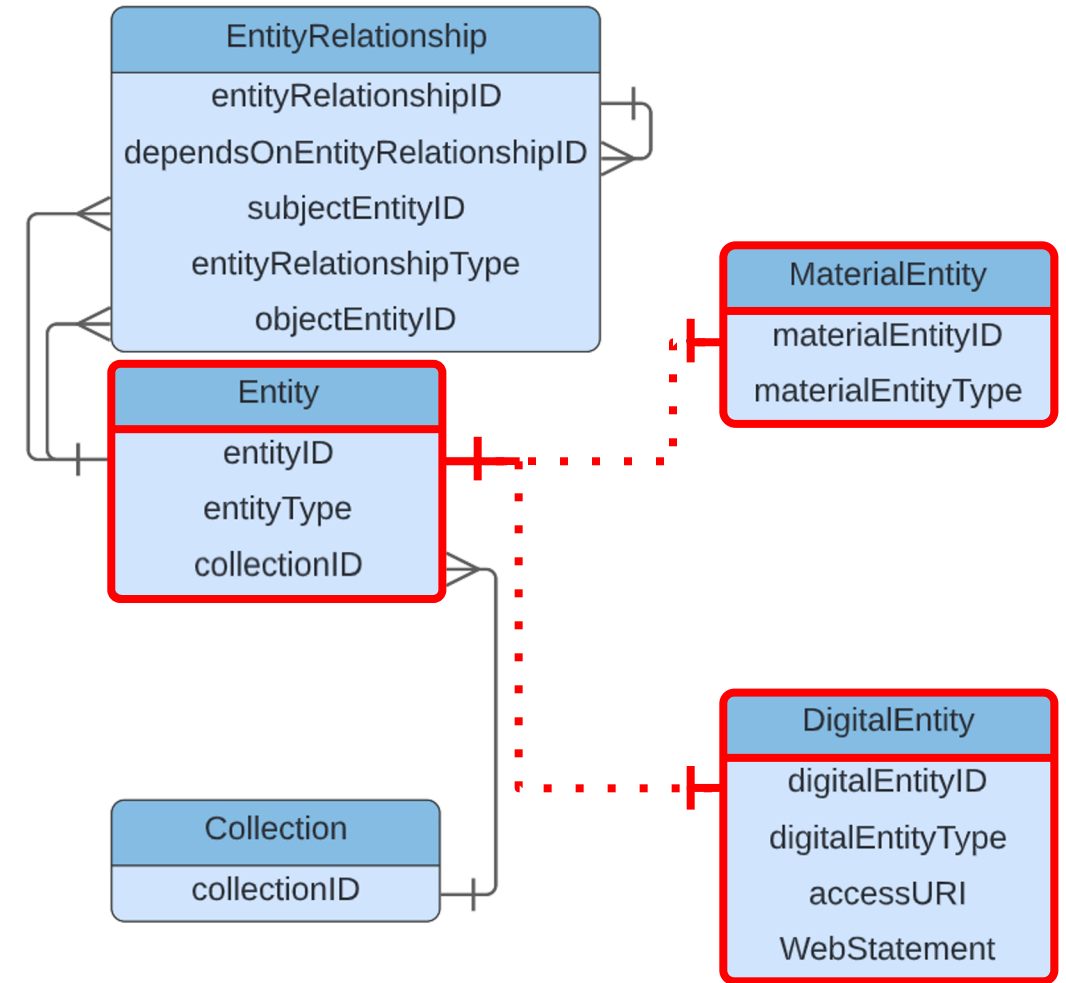


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2022-04



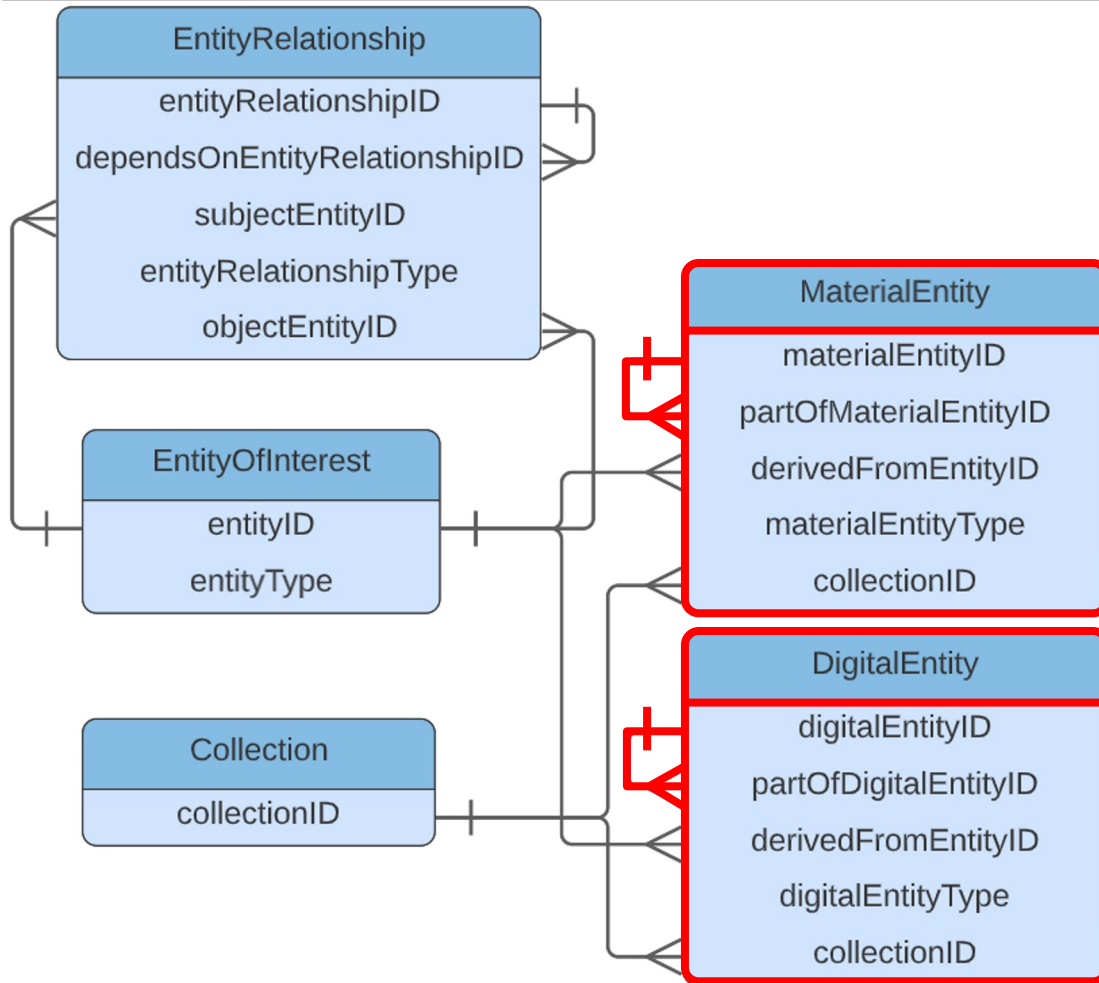
2022-07



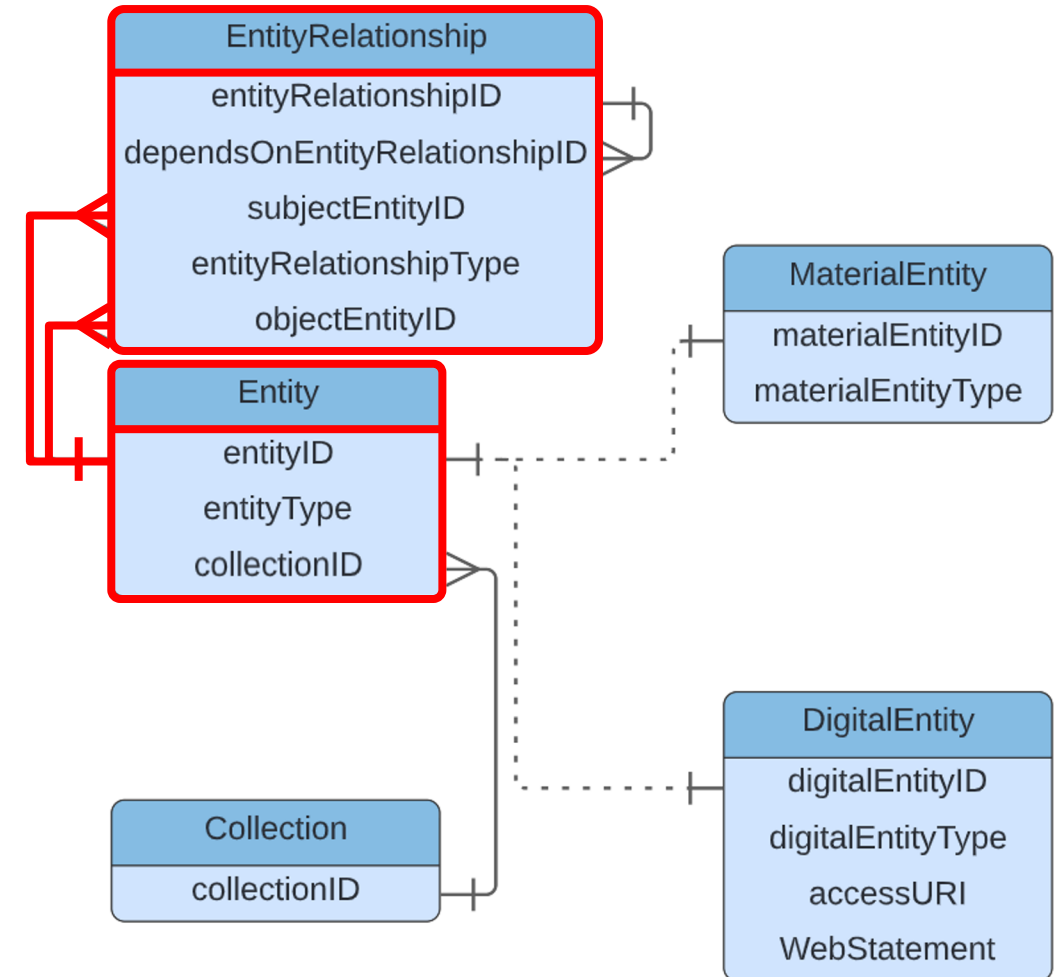
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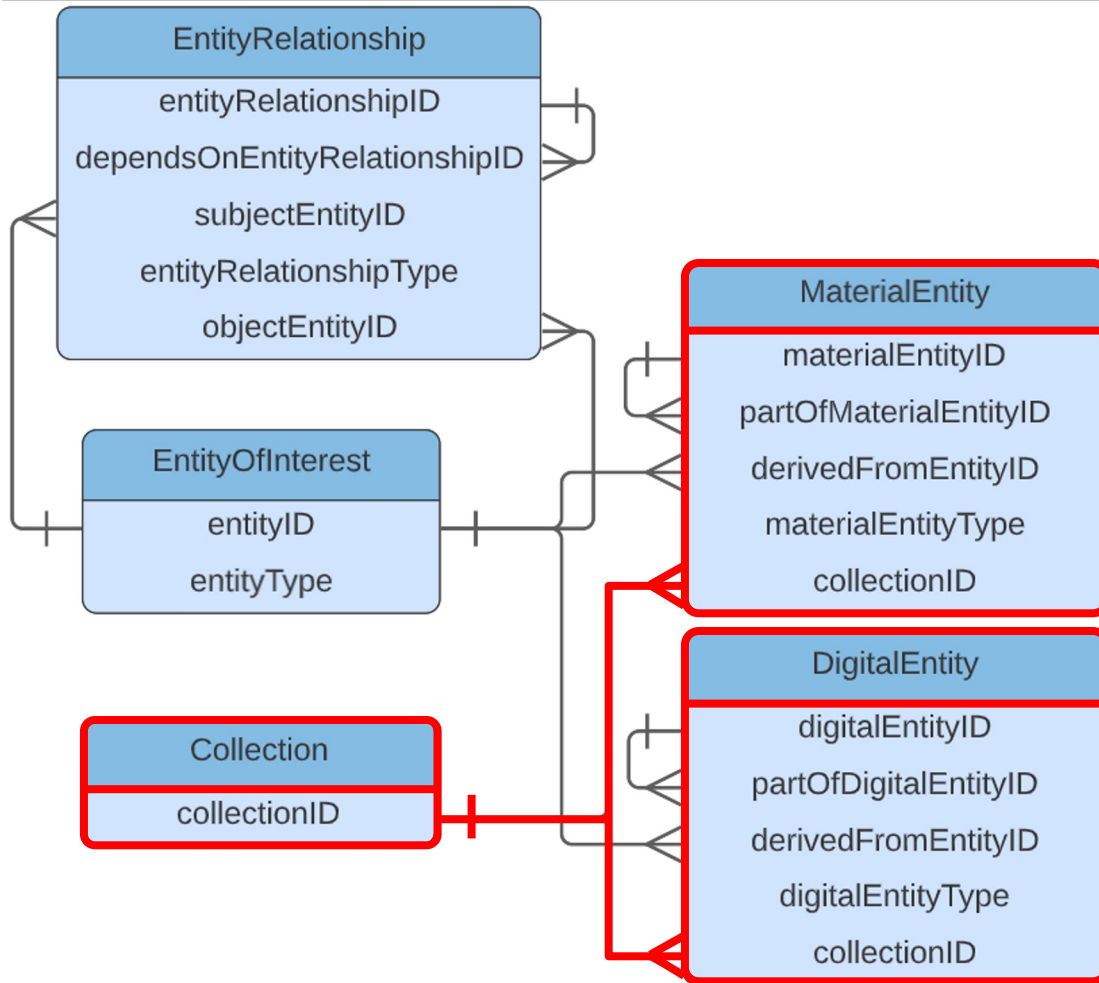


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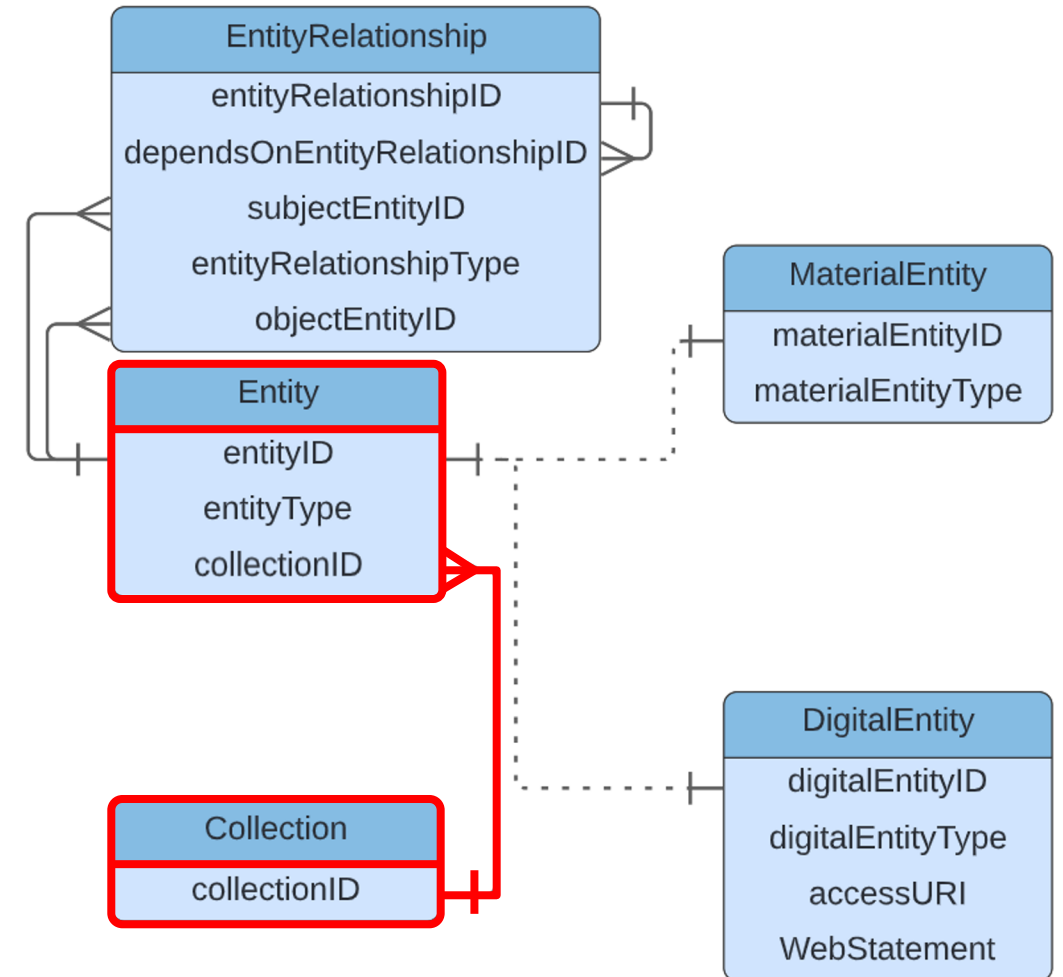


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2022-04



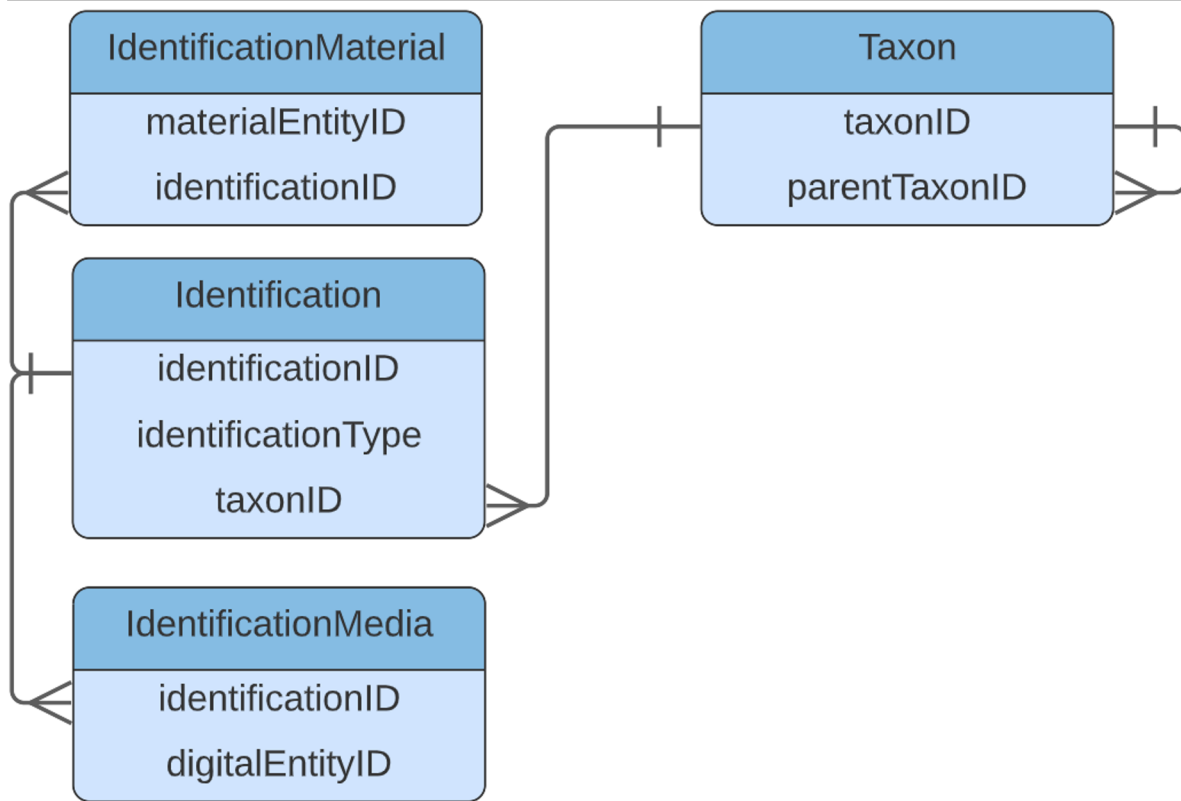
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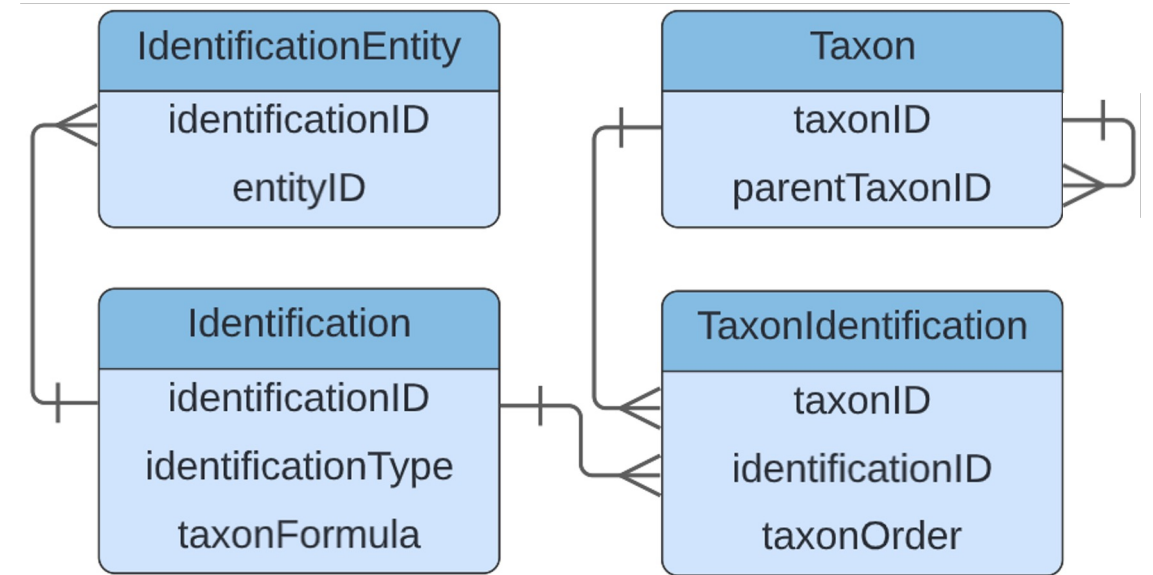
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# Identifications in the Unified Model

2022-04



2022-07

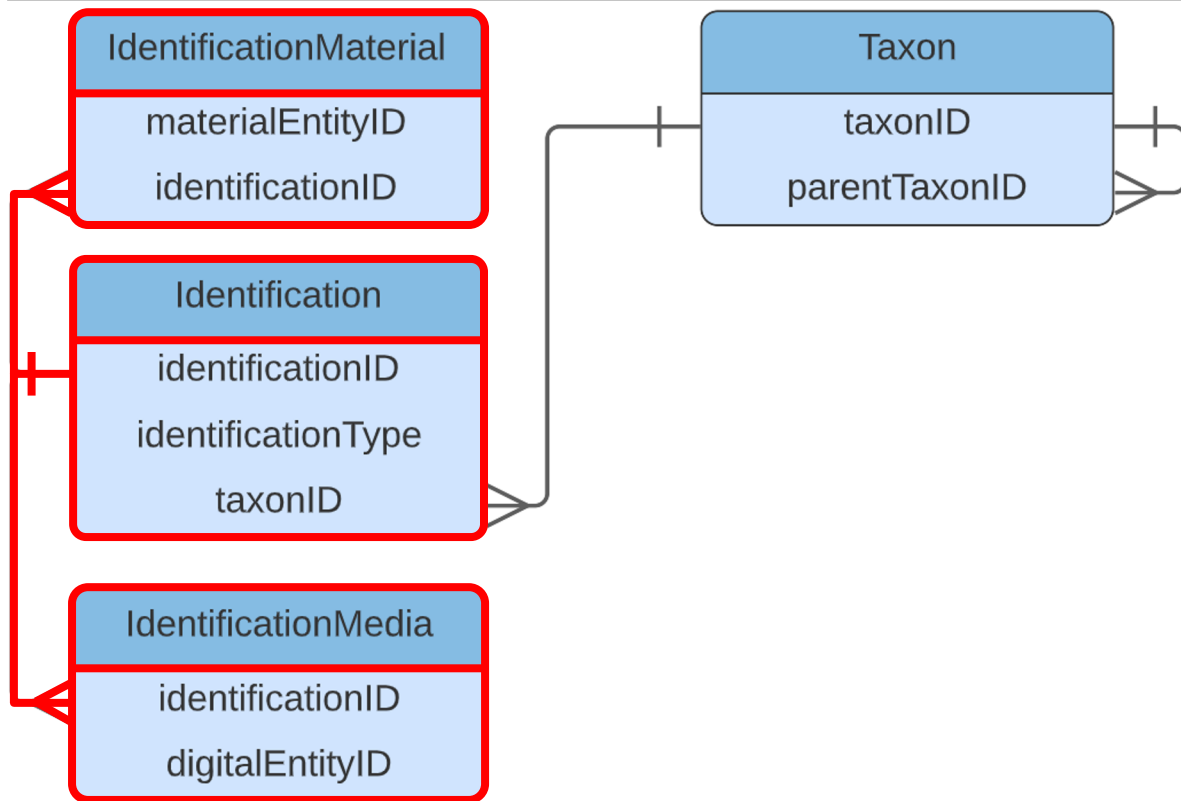


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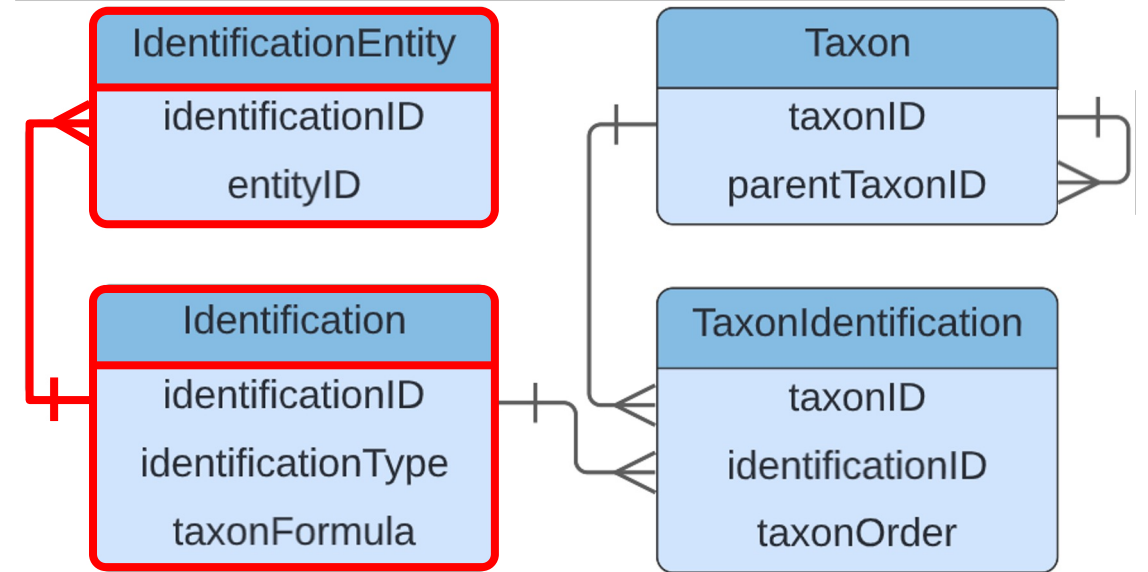


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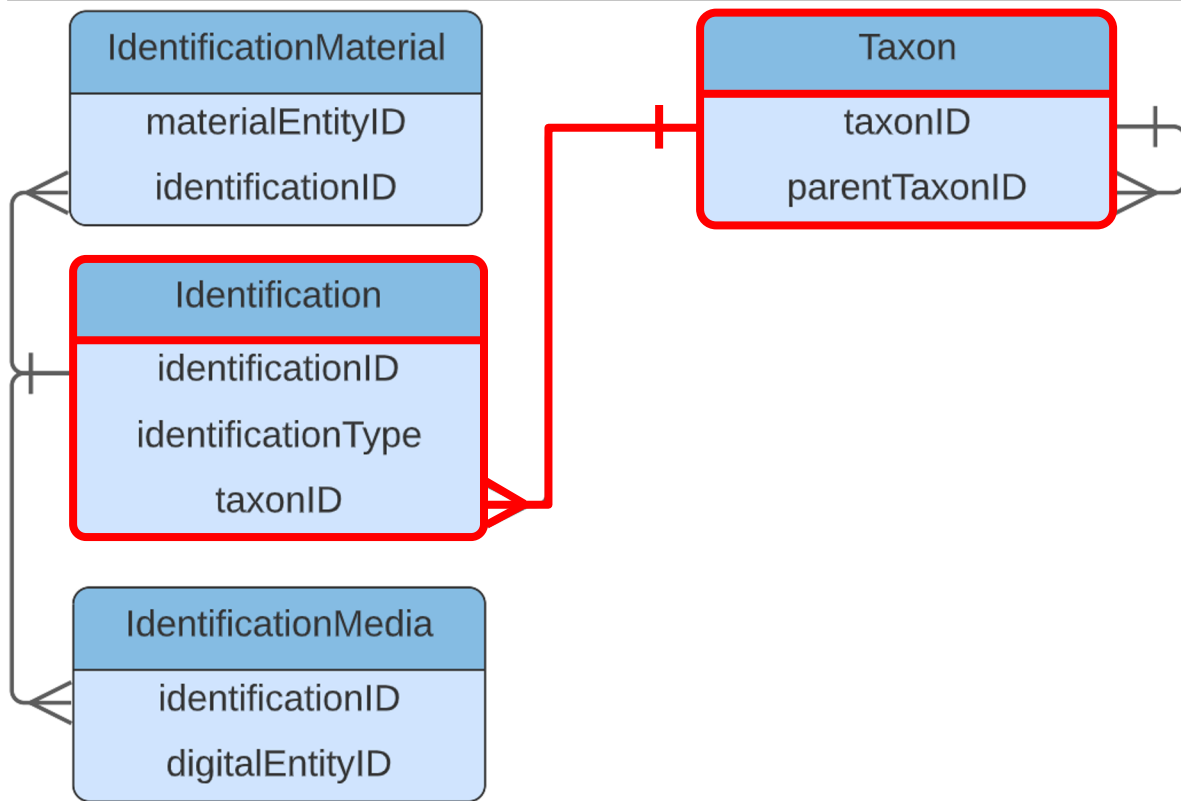
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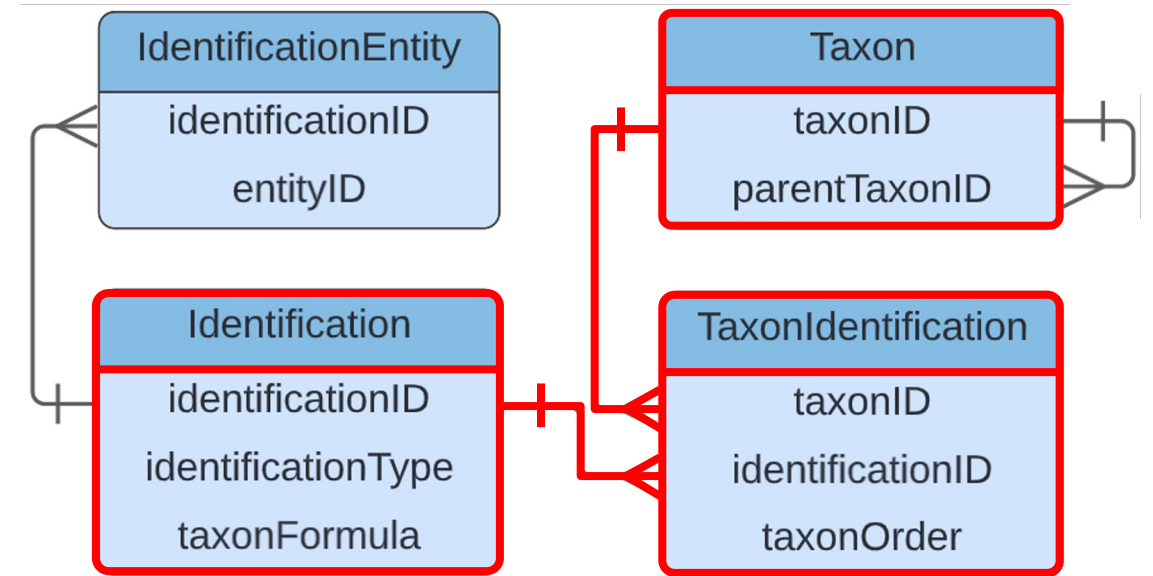
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2022-04



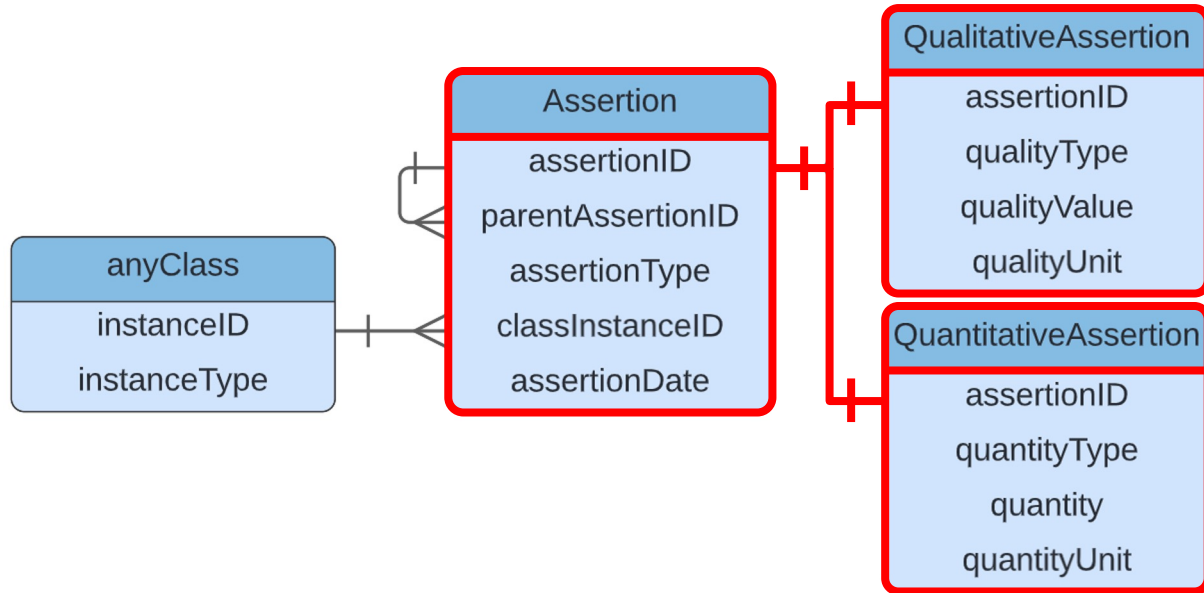
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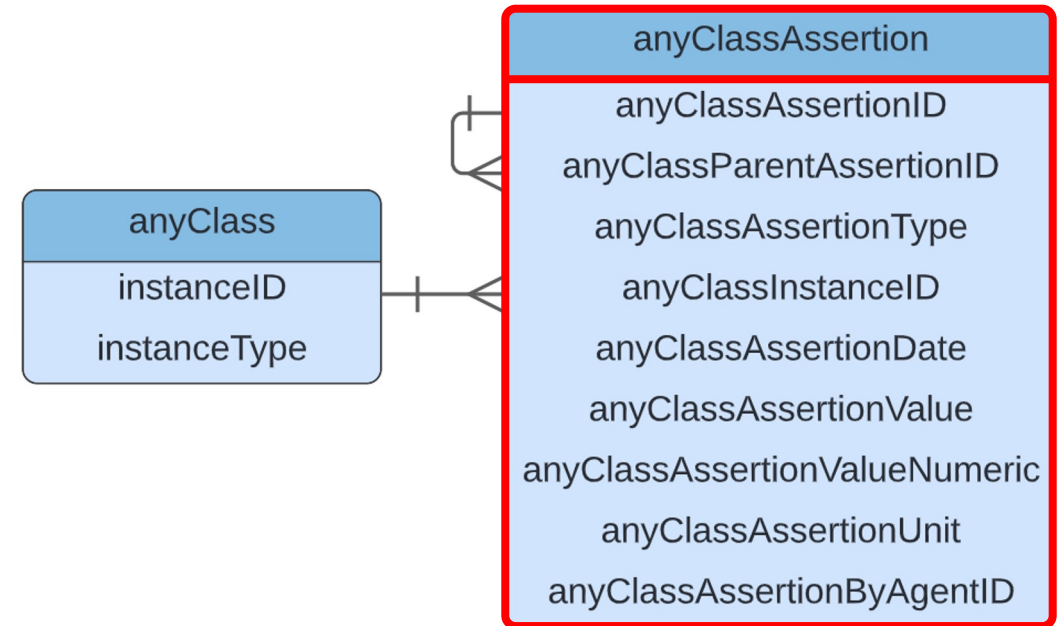
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# Assertions in the Unified Model

2022-04



2022-07

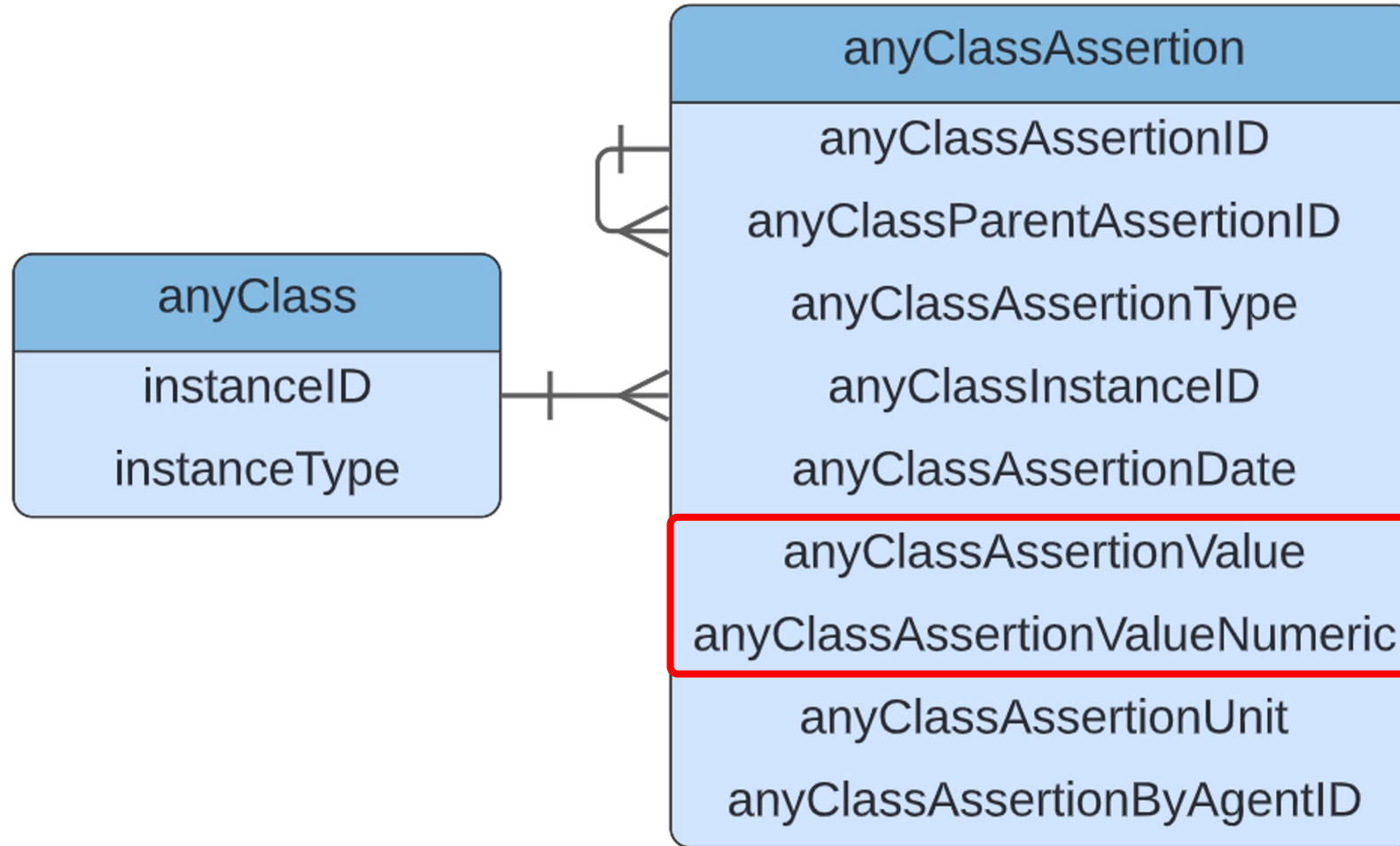


Diversifying the GBIF Data Model: <https://tinyurl.com/diversifying-gbif-data>



# Assertions in the Unified Model

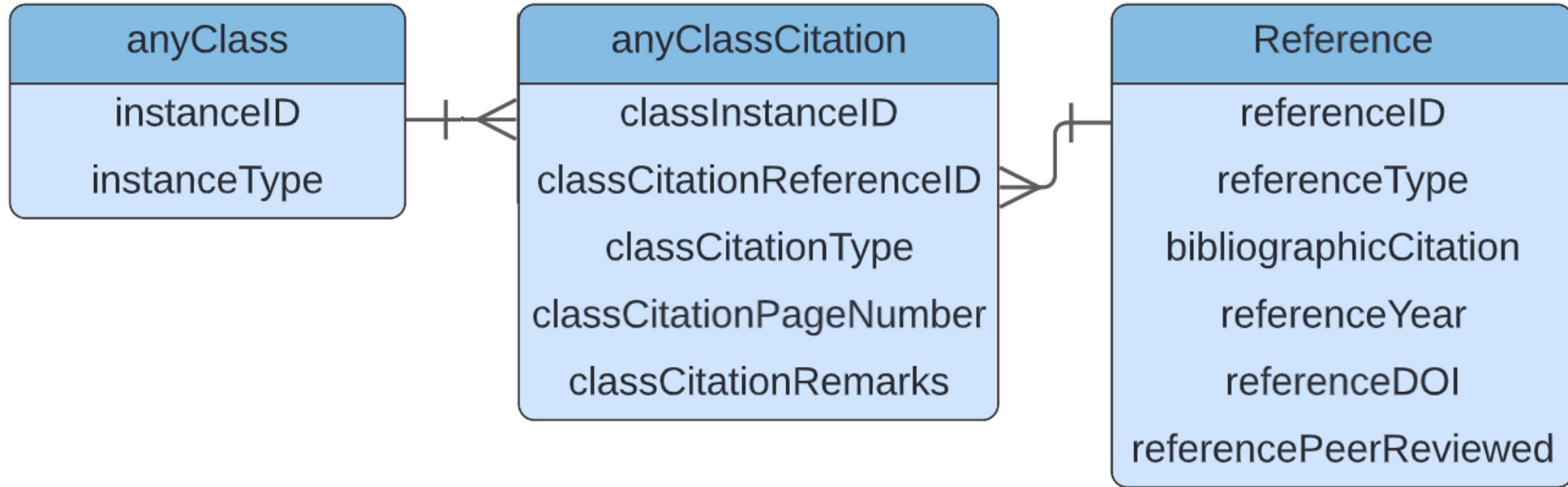
2022-07



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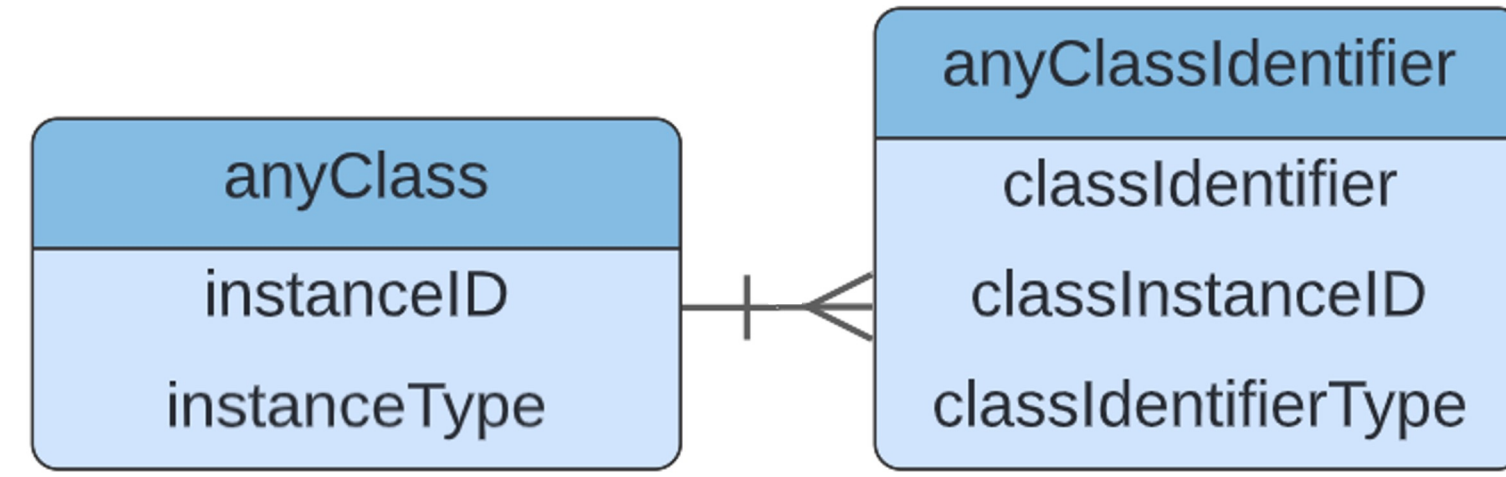
2022-07



Diversifying the GBIF Data Model: <https://tinyurl.com/diversifying-gbif-data>

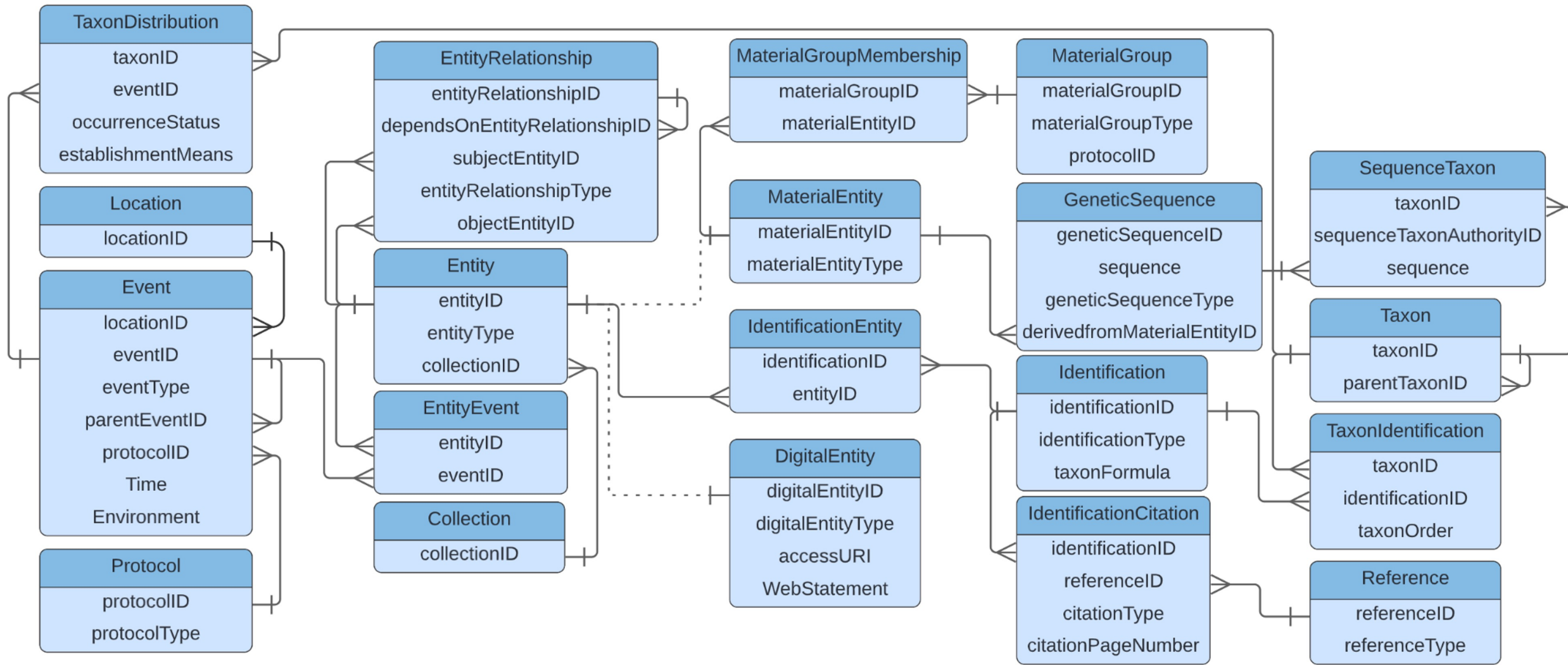
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2022-07



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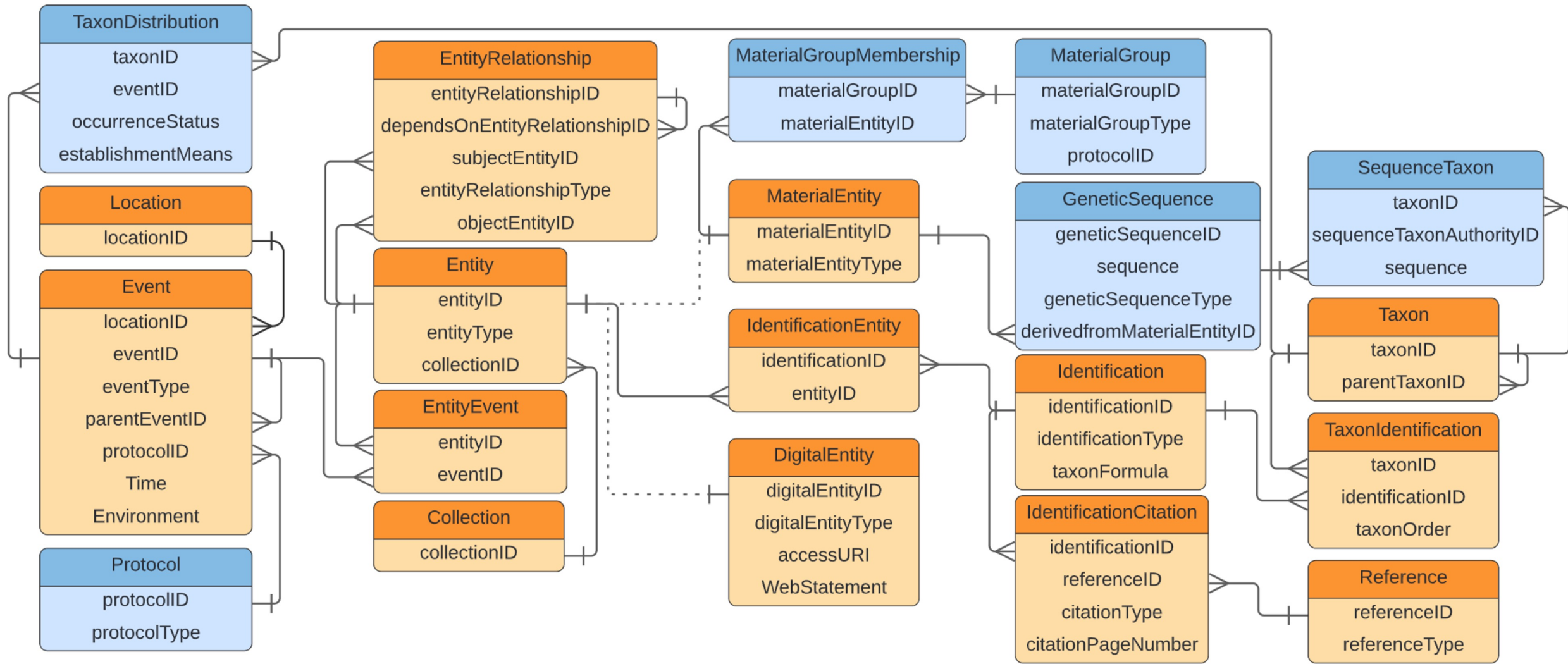


Diversifying the GBIF Data Model: <https://tinyurl.com/diversifying-gbif-data>




# GBIF Unified Model 2022-07

## Arctos use case



Diversifying the GBIF Data Model: <https://tinyurl.com/diversifying-gbif-data>

# Arctos Collection Management System Case Study



Collaborative Collection Management Solution

Search

Portals

My Stuff

Join Arctos

About/Help

Log In

Access to 4,381,124 records

Search

Clear Form

See results as: 

Catalog Records

Type: 

any

Require Tissues?

Identifiers

Customize

Show More Options

Collection: 

Select options

Catalog Number:

Any Identifier:

Identification and Taxonomy

Show More Options

Any taxon, ID, common name: 

identification; classification + related term; common name

Add = for exact match

Locality

Show More Options

Any Geographic Element: 

Spatial Tools

Date/Collector

Show More Options

Help

Agent Role

Define

Catalog Record

Show More Options

Part Search: 

parts, attributes, remarks

Usage

Show More Options

Basis of Citation: 

Define

Media

Show More Options

Media Type: 

Define

Relationships

Show More Options

Relationship:

Curatorial

Show More Options

Part Barcode: 

NULL

Search

Clear Form

Try something random

Hide This

on this day...

Myodes Pallas, 1811



Pterostichus Bonelli, 1810

Deschampsia komarovii Vassiliev

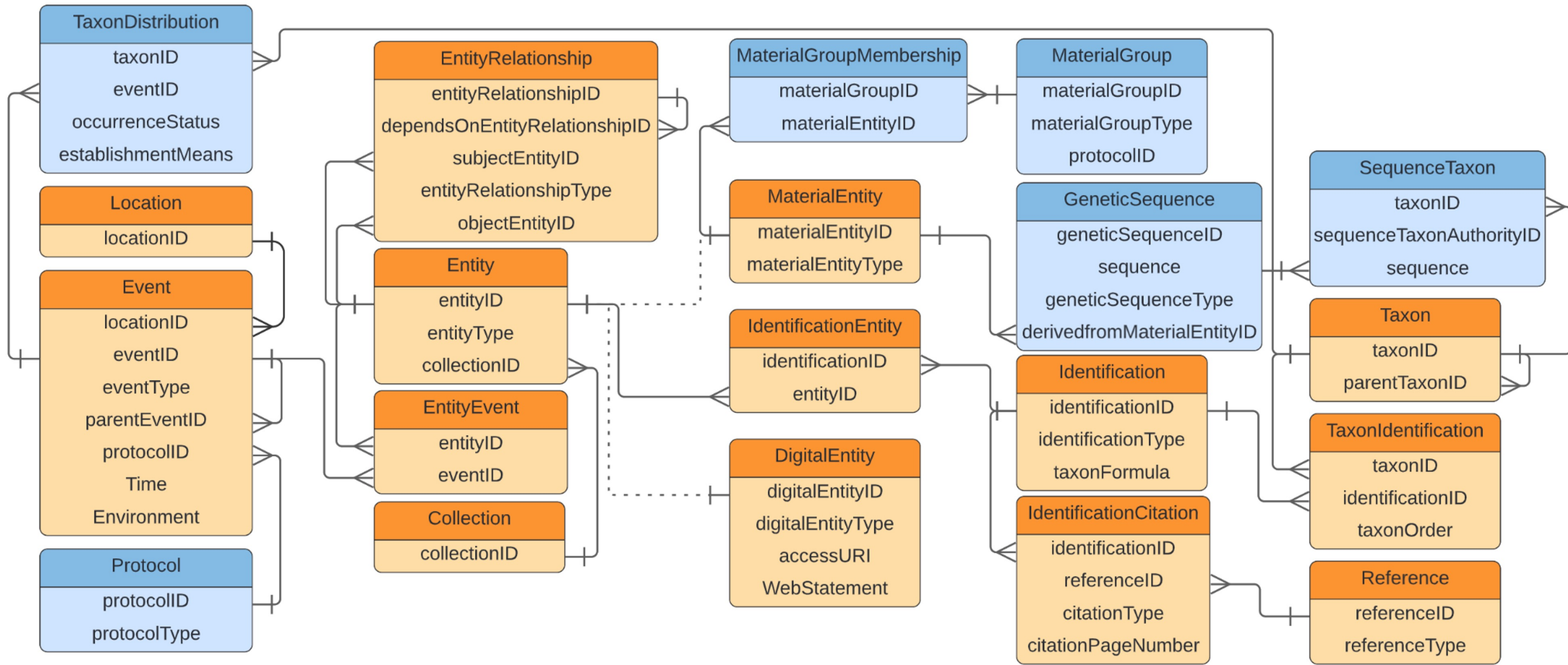
Gadus macrocephalus Tilesius, 1810





Arctos Collaborative Collection Management Solution: <https://arctos.database.museum/>

# Arctos in the GBIF Unified Model 2022-07



Diversifying the GBIF Data Model: <https://tinyurl.com/diversifying-gbif-data>



# Arctos Chipmunk Specimen



## DMNS Mammals

License: [CC BY-NC](#)

Terms: [Arctos Data Ownership and Use](#)

[Collection Details](#)

[Loan Policy](#)

[Log In](#)

[Search](#) [Portals](#) [My Stuff](#) [Join Arctos](#) [About/Help](#)

**DMNS:Mamm:11098**

***Tamias quadrivittatus***

**Sangre de Cristo Mountains, 2 miles northeast of Crestone, canyon of North**

**Crestone Creek**

North America, United States, Colorado, Saguache County

14 July 2007 (2007-07-14)

### Parts:

liver; skin; study; skeleton; heart; kidney; liver; ectoparasite;  
baculum

Comment or report bad  
data [\[0\]](#)[\[1\]](#)

[\[ expand all \]](#) [\[ collapse all \]](#)

### Identifications [\[ collapse \]](#)

[Tamias quadrivittatus](#) [\[ link \]](#)

*Tamias quadrivittatus*

Animalia, Chordata, Mammalia, Rodentia, Sciurognathi, Sciuridae, Sciurinae, Tamias, Tamias quadrivittatus  
Colorado chipmunk

Identified by [John R. Demboski](#) [\[ i \]](#) on 2007-07-13

Nature of ID: [features](#)

Confidence: [high](#)

Remarks: Former nature\_of\_id: expert.

### collector

[John R. Demboski](#) [\[ i \]](#)

### preparator

[John R. Demboski](#) [\[ i \]](#)

[GBIF Occurrence](#) [\[ i \]](#)

[GBIF Occurrence](#) [\[ i \]](#)

[iDigBio Occurrence](#) [\[ i \]](#)

[GloBI](#)



### Citations [\[ collapse \]](#)

[host voucher](#) of *Tamias quadrivittatus* in Bell et al. 2015 [DOI:10.1654/4756.1](#) [\[ i \]](#)

[voucher](#) of *Tamias quadrivittatus* in Chinn (2018)

[voucher](#) of *Tamias quadrivittatus* in Sullivan et al. 2014 [DOI:10.1038/hdy.2014.27](#) [\[ i \]](#)

[host voucher](#) of *Tamias quadrivittatus* in Pigage et al. (2017) [\[ i \]](#) [DOI:10.1654/1525-2647-84.2.135](#) [\[ i \]](#)

### Attributes [\[ collapse \]](#)

Attribute	Value	Determiner	Date	Method	Remark
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<a href="#">ectoparasite examination</a>	<a href="#">yes</a>	<a href="#">John R. Demboski</a> <a href="#">[ i ]</a>	2007-09-27		
<a href="#">ectoparasites detected</a>	<a href="#">yes</a>	<a href="#">John R. Demboski</a> <a href="#">[ i ]</a>	2007-09-27		
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<a href="#">endoparasites detected</a>	<a href="#">no</a>	<a href="#">John R. Demboski</a> <a href="#">[ i ]</a>	2007-09-27		
<a href="#">hind foot with claw</a>	32 <a href="#">mm</a>	<a href="#">John R. Demboski</a> <a href="#">[ i ]</a>	2007-09-27		

### Media linked to this Cataloged Item.

Showing results 1 - 2 of 2

[Media Gallery](#)



[image \(image/jpeg\)](#)

[Media Details](#)

[DMNS](#) [\[ i \]](#)



[image \(image/jpeg\)](#)

[Media Details](#)

[DMNS](#) [\[ i \]](#)

Diversifying the GBIF Data Model: <https://arctos.database.museum/guid/DMNS:Mamm:11098>



# Arctos Chipmunk Specimen



## DMNS Mammals

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**DMNS:Mamm:11098**

***Tamias quadrivittatus***

**Sangre de Cristo Mountains, 2 miles northeast of Crestone, canyon of North**

**Crestone Creek**

North America, United States, Colorado, Saguache County

14 July 2007 (2007-07-14)

### Parts:

liver; skin; study; skeleton; heart; kidney; liver; ectoparasite;  
baculum

Comment or report bad  
data [\[0\]](#)[\[1\]](#)

[\[ expand all \]](#) [\[ collapse all \]](#)

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[Tamias quadrivittatus](#) [\[ link \]](#)

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[GBIF Occurrence](#) [\[ i \]](#)

[iDigBio Occurrence](#) [\[ i \]](#)

[GloBI](#)



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Showing results 1 - 2 of 2

[Media Gallery](#)



[image \(image/jpeg\)](#)

[Media Details](#)

[DMNS](#) [\[ i \]](#)



[image \(image/jpeg\)](#)

[Media Details](#)

[DMNS](#) [\[ i \]](#)


Diversifying the GBIF Data Model: <https://arctos.database.museum/guid/DMNS:Mamm:11098>

# Arctos Chipmunk Specimen


Cataloged Item Specimen (Organism)




Attributes




Identifiers



Relationships



<http://arctos.database.museum/guid/DMNS:Mamm:11098>



DMNS Mammals

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Terms: [Arctos Data Ownership and Use](#)

[Collection Details](#)

[Loan Policy](#)

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DMNS:Mamm:11098

Sangre de Cristo Mountains, 2 miles northeast of Crestone, canyon of North Crestone Creek

North America, United States, Colorado, Saguache County

14 July 2007 (2007-07-14)

Parts:

liver; skin, study; skeleton; heart, kidney; liver; ectoparasite; baculum

Comment or report bad data [\[0\]](#)[\[1\]](#)

[ expand all ]

[ collapse all ]

Identifications [\[ collapse \]](#)

[Tamias quadrivittatus](#) [\[ link \]](#)

*Tamias quadrivittatus*

Animalia, Chordata, Mammalia, Rodentia, Sciurognathi, Sciuridae, Sciurinae, Tamias, Tamias quadrivittatus

Colorado chipmunk

Identified by [John R. Demboski](#) on 2007-07-13

Nature of ID: [features](#)

Confidence: [high](#)

Remarks: Former nature\_of\_id: expert.

Citations [\[ collapse \]](#)

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Showing results 1 - 2 of 2 [Media Gallery](#)



[image \(image/peg\)](#)

[Media Details](#)

[DMNS](#)



[image \(image/peg\)](#)

[Media Details](#)

[DMNS](#)

[collector](#)

[John R. Demboski](#)

[preparator](#)

[John R. Demboski](#)

[GBIF Occurrence](#)

[GBIF Occurrence](#)

[iDigBio Occurrence](#)

[GloBI](#)

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# Arctos Chipmunk Specimen

Cataloged Item  
Specimen  
(Organism)



Attributes



Identifiers



Relationships



<http://arctos.database.museum/guid/DMNS:Mamm:11098>

DMNS Mammals

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Terms: [Arctos Data Ownership and Use](#)  
[Collection Details](#)  
[Loan Policy](#)

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**DMNS:Mamm:11098** **Sangre de Cristo Mountains, 2 miles northeast of Crestone, canyon of North**  
***Tamias quadrivittatus*** **Crestone Creek**  
North America, United States, Colorado, Saguache County  
14 July 2007 (2007-07-14)

Parts:  
liver; skin, study; skeleton; heart, kidney; liver; ectoparasite;  
baculum

Comment or report bad data [\[0\]](#)[\[1\]](#)

[ expand all ] [ collapse all ]

Identifications [ collapse ]  
[Tamias quadrivittatus](#) [ link ]  
*Tamias quadrivittatus*  
Animalia, Chordata, Mammalia, Rodentia, Sciurognathi, Sciuridae, Sciurinae, Tamias, Tamias quadrivittatus  
Colorado chipmunk  
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[voucher](#) of *Tamias quadrivittatus* in Chinn (2018)  
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Showing results 1 - 2 of 2 [Media Gallery](#)

[image \(image/peg\)](#)  
[Media Details](#)  
[DMNS](#)

[image \(image/peg\)](#)  
[Media Details](#)  
[DMNS](#)

[collector](#)  
[John R. Demboski](#)

[preparator](#)  
[John R. Demboski](#)

[GBIF Occurrence](#)  
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<a href="#">endoparasite examination</a>	yes	<a href="#">John R. Demboski</a>	2007-09-27		
<a href="#">endoparasites detected</a>	no	<a href="#">John R. Demboski</a>	2007-09-27		
<a href="#">hind foot with claw</a>	32 mm	<a href="#">John R. Demboski</a>	2007-09-27		



# Arctos Chipmunk: Specimen Attributes

Cataloged Item  
Specimen  
(Organism)



Attributes



Identifiers



Relationships

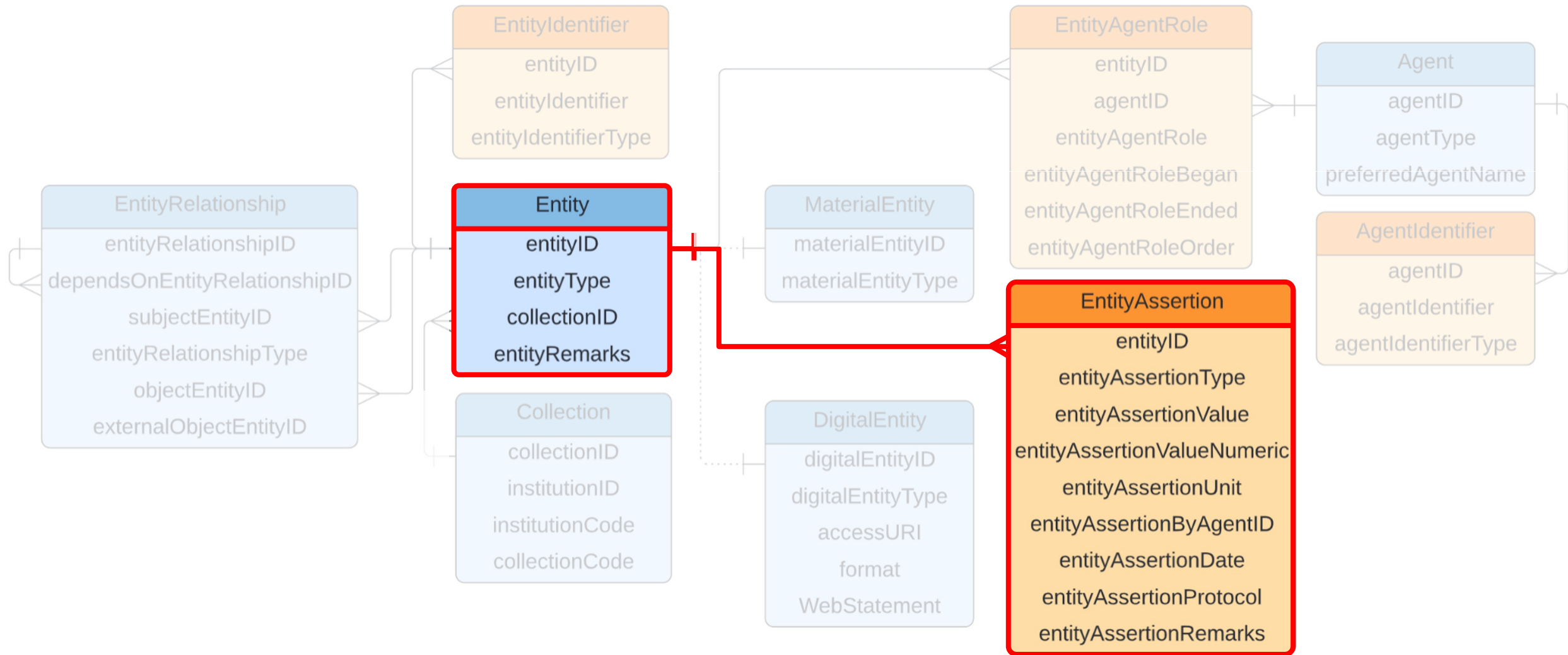


<http://arctos.database.museum/guid/DMNS:Mamm:11098>

Attribute	Value	Determiner	Date	Method	Remark
<u>ear from notch</u>	20 <u>mm</u>	<a href="#">John R. Demboski</a>	2007-09-27		
<u>ectoparasite examination</u>	<u>yes</u>	<a href="#">John R. Demboski</a>	2007-09-27		
<u>ectoparasites detected</u>	<u>yes</u>	<a href="#">John R. Demboski</a>	2007-09-27		
<u>endoparasite examination</u>	<u>yes</u>	<a href="#">John R. Demboski</a>	2007-09-27		
<u>endoparasites detected</u>	<u>no</u>	<a href="#">John R. Demboski</a>	2007-09-27		
<u>hind foot with claw</u>	32 <u>mm</u>	<a href="#">John R. Demboski</a>	2007-09-27		
<u>reproductive data</u>	testes: 3x2 mm (abdominal)	<a href="#">John R. Demboski</a>	2007-09-27		
<u>sex</u>	<u>male</u>	<a href="#">John R. Demboski</a>	2007-09-27		
<u>tail length</u>	105 <u>mm</u>	<a href="#">John R. Demboski</a>	2007-09-27		
<u>total length</u>	220 <u>mm</u>	<a href="#">John R. Demboski</a>	2007-09-27		
<u>weight</u>	43.1 <u>g</u>	<a href="#">John R. Demboski</a>	2007-09-27		



# Arctos Case Study: Entity Assertions



Diversifying the GBIF Data Model: <https://tinyurl.com/diversifying-gbif-data>

# EntityAssertions from Specimen Attributes

## EntityAssertion

entityID

entityAssertionType

entityAssertionValue

entityAssertionValueNumeric

entityAssertionUnit

entityAssertionByAgentID

entityAssertionDate

entityAssertionProtocol

entityAssertionRemarks

Attribute	Value	Determiner	Date	Method	Remark
<u>ear from notch</u>	20 <u>mm</u>	<u>John R. Demboski</u> <a href="#">i</a>	2007-09-27		
<u>ectoparasite examination</u>	<u>yes</u>	<u>John R. Demboski</u> <a href="#">i</a>	2007-09-27		
<u>ectoparasites detected</u>	<u>yes</u>	<u>John R. Demboski</u> <a href="#">i</a>	2007-09-27		
<u>endoparasite examination</u>	<u>yes</u>	<u>John R. Demboski</u> <a href="#">i</a>	2007-09-27		
<u>endoparasites detected</u>	<u>no</u>	<u>John R. Demboski</u> <a href="#">i</a>	2007-09-27		
<u>hind foot with claw</u>	32 <u>mm</u>	<u>John R. Demboski</u> <a href="#">i</a>	2007-09-27		
<u>reproductive data</u>	testes: 3x2 mm (abdominal)	<u>John R. Demboski</u> <a href="#">i</a>	2007-09-27		
<u>sex</u>	<u>male</u>	<u>John R. Demboski</u> <a href="#">i</a>	2007-09-27		
<u>tail length</u>	105 <u>mm</u>	<u>John R. Demboski</u> <a href="#">i</a>	2007-09-27		
<u>total length</u>	220 <u>mm</u>	<u>John R. Demboski</u> <a href="#">i</a>	2007-09-27		
<u>weight</u>	43.1 <u>g</u>	<u>John R. Demboski</u> <a href="#">i</a>	2007-09-27		

# EntityAssertions from Specimen Attributes

EntityAssertion

entityID

entityAssertionType

entityAssertionValue

entityAssertionValueNumeric












entityAssertionUnit

entityAssertionByAgentID

entityAssertionDate












entityAssertionProtocol

entityAssertionRemarks

Attribute	Value	Determiner	Date	Method	Remark
<u>ear from notch</u>	20 <u>mm</u>	<u>John R. Demboski</u> 	2007-09-27		
<u>ectoparasite examination</u>	<u>yes</u>	<u>John R. Demboski</u> 	2007-09-27		
<u>ectoparasites detected</u>	<u>yes</u>	<u>John R. Demboski</u> 	2007-09-27		
<u>endoparasite examination</u>	<u>yes</u>	<u>John R. Demboski</u> 	2007-09-27		
<u>endoparasites detected</u>	<u>no</u>	<u>John R. Demboski</u> 	2007-09-27		
<u>hind foot with claw</u>	32 <u>mm</u>	<u>John R. Demboski</u> 	2007-09-27		
<u>reproductive data</u>	testes: 3x2 mm (abdominal)	<u>John R. Demboski</u> 	2007-09-27		
<u>sex</u>	<u>male</u>	<u>John R. Demboski</u> 	2007-09-27		
<u>tail length</u>	105 <u>mm</u>	<u>John R. Demboski</u> 	2007-09-27		
<u>total length</u>	220 <u>mm</u>	<u>John R. Demboski</u> 	2007-09-27		
<u>weight</u>	43.1 <u>g</u>	<u>John R. Demboski</u> 	2007-09-27		

# EntityAssertions from Specimen Attributes

EntityAssertion
entityID
entityAssertionType
entityAssertionValue
entityAssertionValueNumeric
entityAssertionUnit
entityAssertionByAgentID
entityAssertionDate
entityAssertionProtocol
entityAssertionRemarks

Attribute	Value	Determiner	Date	Method	Remark
<u>ear from notch</u>	20 <u>mm</u>	<a href="#">John R. Demboski</a> 	2007-09-27		
<u>ectoparasite examination</u>	<u>yes</u>	<a href="#">John R. Demboski</a> 	2007-09-27		
<u>ectoparasites detected</u>	<u>yes</u>	<a href="#">John R. Demboski</a> 	2007-09-27		
<u>endoparasite examination</u>	<u>yes</u>	<a href="#">John R. Demboski</a> 	2007-09-27		
<u>endoparasites detected</u>	<u>no</u>	<a href="#">John R. Demboski</a> 	2007-09-27		
<u>hind foot with claw</u>	32 <u>mm</u>	<a href="#">John R. Demboski</a> 	2007-09-27		
<u>reproductive data</u>	testes: 3x2 mm (abdominal)	<a href="#">John R. Demboski</a> 	2007-09-27		
<u>sex</u>	<u>male</u>	<a href="#">John R. Demboski</a> 	2007-09-27		
<u>tail length</u>	105 <u>mm</u>	<a href="#">John R. Demboski</a> 	2007-09-27		
<u>total length</u>	220 <u>mm</u>	<a href="#">John R. Demboski</a> 	2007-09-27		
<u>weight</u>	43.1 <u>g</u>	<a href="#">John R. Demboski</a> 	2007-09-27		



# EntityAssertions from Specimen Attributes

EntityAssertion

entityID

entityAssertionType

entityAssertionValue

entityAssertionValueNumeric












entityAssertionUnit

entityAssertionByAgentID

entityAssertionDate

entityAssertionProtocol

entityAssertionRemarks

Attribute	Value	Determiner	Date	Method	Remark
ear from notch	20 mm	<a href="#">John R. Demboski</a> 	2007-09-27		
ectoparasite examination	yes	<a href="#">John R. Demboski</a> 	2007-09-27		
ectoparasites detected	yes	<a href="#">John R. Demboski</a> 	2007-09-27		
endoparasite examination	yes	<a href="#">John R. Demboski</a> 	2007-09-27		
endoparasites detected	no	<a href="#">John R. Demboski</a> 	2007-09-27		
hind foot with claw	32 mm	<a href="#">John R. Demboski</a> 	2007-09-27		
reproductive data	testes: 3x2 mm (abdominal)	<a href="#">John R. Demboski</a> 	2007-09-27		
sex	male	<a href="#">John R. Demboski</a> 	2007-09-27		
tail length	105 mm	<a href="#">John R. Demboski</a> 	2007-09-27		
total length	220 mm	<a href="#">John R. Demboski</a> 	2007-09-27		
weight	43.1 g	<a href="#">John R. Demboski</a> 	2007-09-27		



EntityAssertions from Specimen Attributes

EntityAssertion

entityID

entityAssertionType

entityAssertionValue

entityAssertionValueNumeric

entityAssertionUnit

entityAssertionByAgentID

entityAssertionDate












entityAssertionProtocol

entityAssertionRemarks

Attribute	Value	Determiner	Date	Method	Remark
ear from notch	20 mm	John R. Demboski	2007-09-27		
ectoparasite examination	<div>sex</div> <div>male</div> <div>female</div> <div>macho</div> <div>hembra</div> <div>男性</div> <div>女性</div> <div>...</div>				
ectoparasites detected					
endoparasite examination					
endoparasites detected					
hind foot with claw					
reproductive data					
sex					
tail length					
total length					
weight	43.1 g	John R. Demboski	2007-09-27		












# EntityAssertions from Specimen Attributes

EntityAssertion
entityID
entityAssertionType
entityAssertionValue
entityAssertionValueNumeric
entityAssertionUnit
entityAssertionByAgentID
entityAssertionDate
entityAssertionProtocol
entityAssertionRemarks

Attribute	Value	Determiner	Date	Method	Remark
ear from notch	20 mm	<a href="#">John R. Demboski</a> 	2007-09-27		
ectoparasite examination	yes	<a href="#">John R. Demboski</a> 	2007-09-27		
ectoparasites detected	yes	<a href="#">John R. Demboski</a> 	2007-09-27		
endoparasite examination	yes	<a href="#">John R. Demboski</a> 	2007-09-27		
endoparasites detected	no	<a href="#">John R. Demboski</a> 	2007-09-27		
hind foot with claw	32 mm	<a href="#">John R. Demboski</a> 	2007-09-27		
reproductive data	testes: 3x2 mm (abdominal)	<a href="#">John R. Demboski</a> 	2007-09-27		
sex	male	<a href="#">John R. Demboski</a> 	2007-09-27		
tail length	105 mm	<a href="#">John R. Demboski</a> 	2007-09-27		
total length	220 mm	<a href="#">John R. Demboski</a> 	2007-09-27		
weight	43.1 g	<a href="#">John R. Demboski</a> 	2007-09-27		

# EntityAssertions from Specimen Attributes

EntityAssertion
entityID
entityAssertionType
entityAssertionValue
entityAssertionValueNumeric
entityAssertionUnit
entityAssertionByAgentID
entityAssertionDate
entityAssertionProtocol
entityAssertionRemarks

Attribute	Value	Determiner	Date	Method	Remark
ear from notch	20 mm	<a href="#">John R. Demboski</a> 	2007-09-27		
ectoparasite examination	yes	<a href="#">John R. Demboski</a> 	2007-09-27		
ectoparasites detected	yes	<a href="#">John R. Demboski</a> 	2007-09-27		
endoparasite examination	yes	<a href="#">John R. Demboski</a> 	2007-09-27		
endoparasites detected	no	<a href="#">John R. Demboski</a> 	2007-09-27		
hind foot with claw	32 mm	<a href="#">John R. Demboski</a> 	2007-09-27		
reproductive data	testes: 3x2 mm (abdominal)	<a href="#">John R. Demboski</a> 	2007-09-27		
sex	male	<a href="#">John R. Demboski</a> 	2007-09-27		
tail length	105 mm	<a href="#">John R. Demboski</a> 	2007-09-27		
total length	220 mm	<a href="#">John R. Demboski</a> 	2007-09-27		
weight	43.1 g	<a href="#">John R. Demboski</a> 	2007-09-27		

# Arctos Fossil Reptile Specimen



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NM Museum of Natural History

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NMMNH:Paleo:42236

Reptilia

Specific locality encumbered

North America, United States, Texas, Howard County

no date, began is locality datefound, end is day of upload (1989-05-27 - 2020-06-25)

Parts:  
bone

Comment or report bad data [\[0\]](#)[\[0\]](#)

[\[ expand all \]](#) [\[ collapse all \]](#)

Identifications [\[ collapse \]](#)

Reptilia [\[ link \]](#)

Reptilia  
Animalia, Chordata, Reptilia  
Reptiles

Identified by unknown

Nature of ID: [unknown](#)

[collector](#)

[Andrew B. Heckert](#) [i](#)

[GBIF Occurrence](#) [i](#)

[iDigBio Occurrence](#) [i](#)

Accession

View [1998.033](#)

Usage

Contributed By Project: [New Mexico Museum of Natural History Collections Digitization](#)

Location (1 Events) [\[ collapse \]](#)



[BerkeleyMapper](#) [i](#)

[highlight linked components](#)

Event Type: [collection](#) assigned by [Andrew B. Heckert](#) [i](#) on 2020-06-25

Verification Status: [unverified](#) [Δ](#)

Event Dates: 1989-05-27 to 2020-06-25 Verbatim Date: no date, began is locality datefound, end is day of upload

Higher Geography: [North America, United States, Texas, Howard County](#) [i](#)

Locality Name: NMMNH:Paleo:L-860\_public

Specific Locality: [Specific locality encumbered](#) [i](#)

Verbatim Locality: [Locality data more refined than county is encumbered, contact collection for details](#) [i](#)

Associated Names: United States, United States of America, Texas, Howard, NORTH AMERICA  
MAINLAND

Diversifying the GBIF Data Model: <https://arctos.database.museum/guid/NMMNH:Paleo:42236>

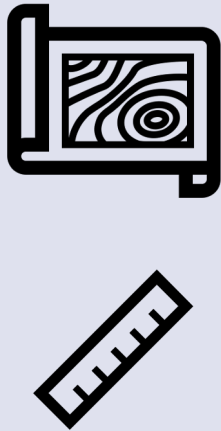


# Arctos Fossil Reptile Specimen: Location Attributes

Cataloged Item  
Specimen  
(Fossil)



Location Attributes

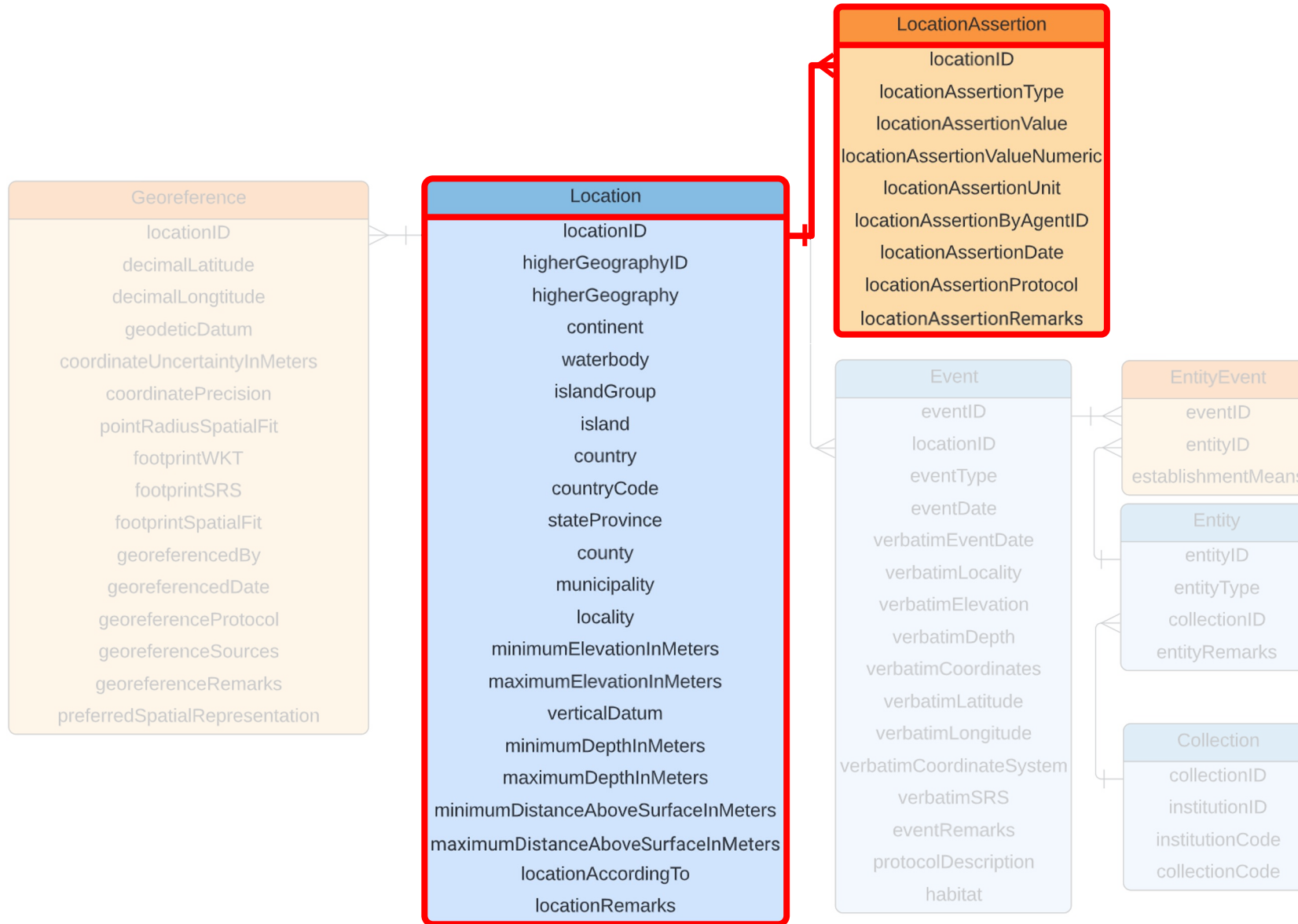


<http://arctos.database.museum/guid/NMMNH:Paleo:42236>

Locality Attribute	Value	Determiner	Method	Date	Remark
<u>Stage/Age</u>	<u>Carnian</u>				
<u>biochron</u>	<u>Otischalkian</u>				
<u>landholder</u>	<u>private</u>				
<u>lithostratigraphic formation</u>	<u>Colorado City Formation</u>				20-30 ft stratigraphically higher, red mudstone
<u>lithostratigraphic group</u>	<u>Dockum Group</u>				20-30 ft stratigraphically higher, red mudstone
<u>lithostratigraphic group</u>	<u>Chinle Group</u>				
<u>site found</u>	1989-05-27	<a href="#">Spencer G. Lucas</a>		1989-05-27	Original Term: Site Found Date
<u>site found</u>	Spencer G. Lucas	<a href="#">Spencer G. Lucas</a>		1989-05-27	Original Term: Site Found By
<u>site identifier</u>	NMMNH:Paleo:L-860	<a href="#">New Mexico Museum of Natural History and Science</a>			Original type: Site Identifier
<u>site identifier</u>	SGL 89-034	<a href="#">Spencer G. Lucas</a>		1989-05-27	Original type: Site Collector Number







# Arctos Case Study: Location Assertions



# LocationAssertions from Location Attributes

LocationAssertion
locationID
locationAssertionType
locationAssertionValue
locationAssertionValueNumeric
locationAssertionUnit
locationAssertionByAgentID
locationAssertionDate
locationAssertionProtocol
locationAssertionRemarks


Locality Attribute	Value	Determiner	Method	Date	Remark
<u>Stage/Age</u>	<u>Carnian</u>				
<u>biochron</u>	<u>Otischalkian</u>				
<u>landholder</u>	<u>private</u>				
<u>lithostratigraphic formation</u>	<u>Colorado City Formation</u>				20-30 ft stratigraphically higher, red mudstone
<u>lithostratigraphic group</u>	<u>Dockum Group</u>				20-30 ft stratigraphically higher, red mudstone
<u>lithostratigraphic group</u>	<u>Chinle Group</u>				
<u>site found</u>	1989-05-27	<a href="#">Spencer G. Lucas</a> 		1989-05-27	Original Term: Site Found Date
<u>site found</u>	Spencer G. Lucas	<a href="#">Spencer G. Lucas</a> 		1989-05-27	Original Term: Site Found By
<u>site identifier</u>	NMMNH:Paleo:L-860	<a href="#">New Mexico Museum of Natural History and Science</a> 			Original type: Site Identifier
<u>site identifier</u>	SGL 89-034	<a href="#">Spencer G. Lucas</a> 		1989-05-27	Original type: Site Collector Number

# Arctos Chipmunk Specimen


Cataloged Item Specimen (Organism)




Attributes




Identifiers



Relationships



<http://arctos.database.museum/guid/DMNS:Mamm:11098>



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**DMNS:Mamm:11098**

**Sangre de Cristo Mountains, 2 miles northeast of Crestone, canyon of North Crestone Creek**

***Tamias quadrivittatus***

North America, United States, Colorado, Saguache County

14 July 2007 (2007-07-14)

Parts:

liver; skin, study; skeleton; heart, kidney; liver; ectoparasite; baculum

Comment or report bad data

[\[0\]](#)[\[1\]](#)

[ expand all ] [ collapse all ]

Identifications [\[ collapse \]](#)

[Tamias quadrivittatus](#) [\[ link \]](#)

*Tamias quadrivittatus*

Animalia, Chordata, Mammalia, Rodentia, Sciurognathi, Sciuridae, Sciurinae, Tamias, Tamias quadrivittatus

Colorado chipmunk

Identified by [John R. Demboski](#) on 2007-07-13

Nature of ID: [features](#)

Confidence: [high](#)

Remarks: Former nature\_of\_id: expert.

Citations [\[ collapse \]](#)

[host voucher](#) of *Tamias quadrivittatus* in Bell et al. 2015 DOI:[10.1654/4756.1](#)

[voucher](#) of *Tamias quadrivittatus* in Chinn (2018)

[voucher](#) of *Tamias quadrivittatus* in Sullivan et al. 2014 DOI:[10.1038/hdy.2014.27](#)

[host voucher](#) of *Tamias quadrivittatus* in Pigage et al. (2017) DOI:[10.1654/1525-2647-84.2.135](#)

Media linked to this Cataloged Item.

Showing results 1 - 2 of 2 [Media Gallery](#)



[image \(image/peg\)](#)

[Media Details](#)

[DMNS](#)



[image \(image/peg\)](#)

[Media Details](#)

[DMNS](#)

[collector](#)

[John R. Demboski](#)

[preparator](#)

[John R. Demboski](#)

[GBIF Occurrence](#)

[GBIF Occurrence](#)

[iDigBio Occurrence](#)


[GloBI](#)

Attributes [\[ collapse \]](#)


Attribute	Value	Determiner	Date	Method	Remark
<a href="#">ear from notch</a>	20 mm	<a href="#">John R. Demboski</a>	2007-09-27		
<a href="#">ectoparasite examination</a>	yes	<a href="#">John R. Demboski</a>	2007-09-27		
<a href="#">ectoparasites detected</a>	yes	<a href="#">John R. Demboski</a>	2007-09-27		
<a href="#">endoparasite examination</a>	yes	<a href="#">John R. Demboski</a>	2007-09-27		
<a href="#">endoparasites detected</a>	no	<a href="#">John R. Demboski</a>	2007-09-27		
<a href="#">hind foot with claw</a>	32 mm	<a href="#">John R. Demboski</a>	2007-09-27		

# Arctos Chipmunk: Specimen Identifiers


Cataloged Item Specimen (Organism)




Attributes



Identifiers



Relationships

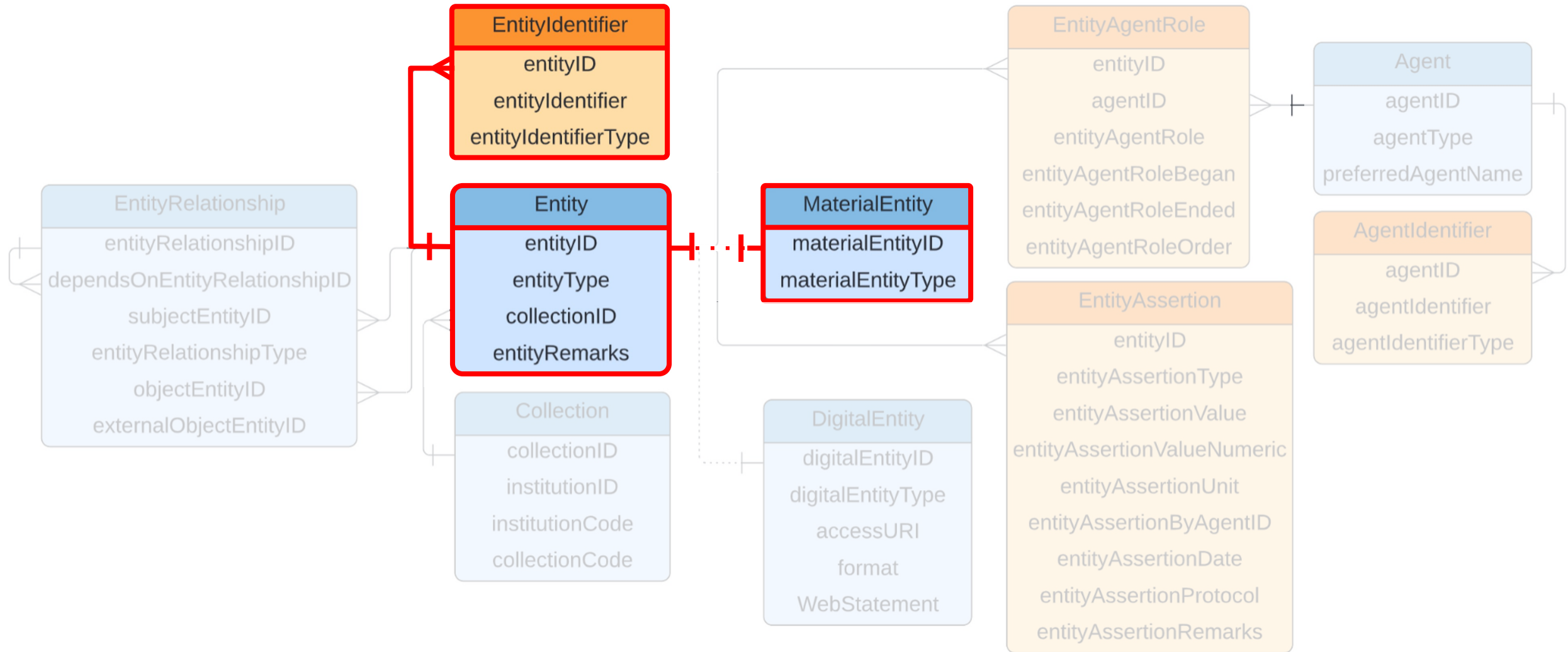


ID Type	ID Value	Link
<a href="#">Dryad DOI</a>	10.5061/dryad.52mp1	<a href="https://datadryad.org/stash/dataset/doi:10.5061/dryad.52mp1">https://datadryad.org/stash/dataset/doi:10.5061/dryad.52mp1</a>
<a href="#">DZTM: Denver Zoology Tissue Mammal</a>	178	
<a href="#">collector number</a>	JRD423	
<a href="#">GenBank</a>	KJ139497	<a href="http://www.ncbi.nlm.nih.gov/nuccore/KJ139497">http://www.ncbi.nlm.nih.gov/nuccore/KJ139497</a>

<http://arctos.database.museum/guid/DMNS:Mamm:11098>

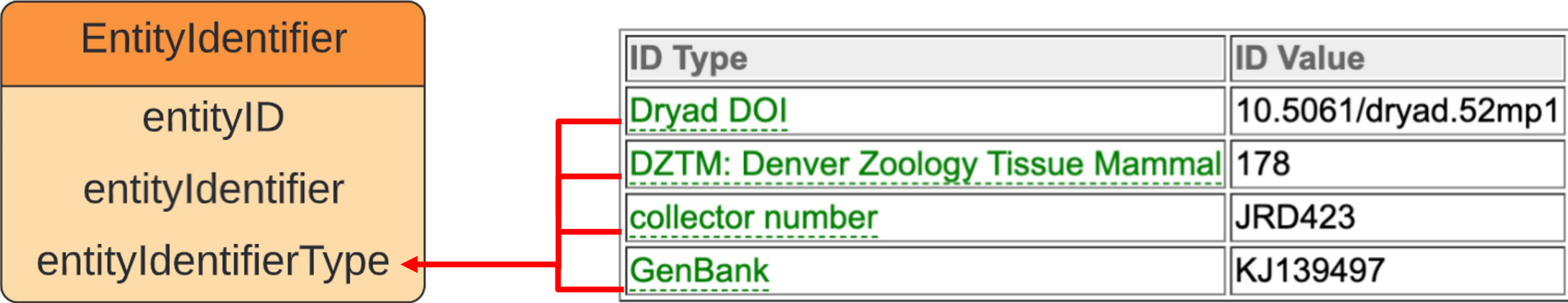


# Arctos Case Study: Entity Identifiers




Diversifying the GBIF Data Model: <https://tinyurl.com/diversifying-gbif-data>

# Arctos Chipmunk: Specimen Identifiers




# Arctos Chipmunk: Specimen Relationships


Cataloged Item  
Specimen  
(Organism)




Attributes



Identifiers



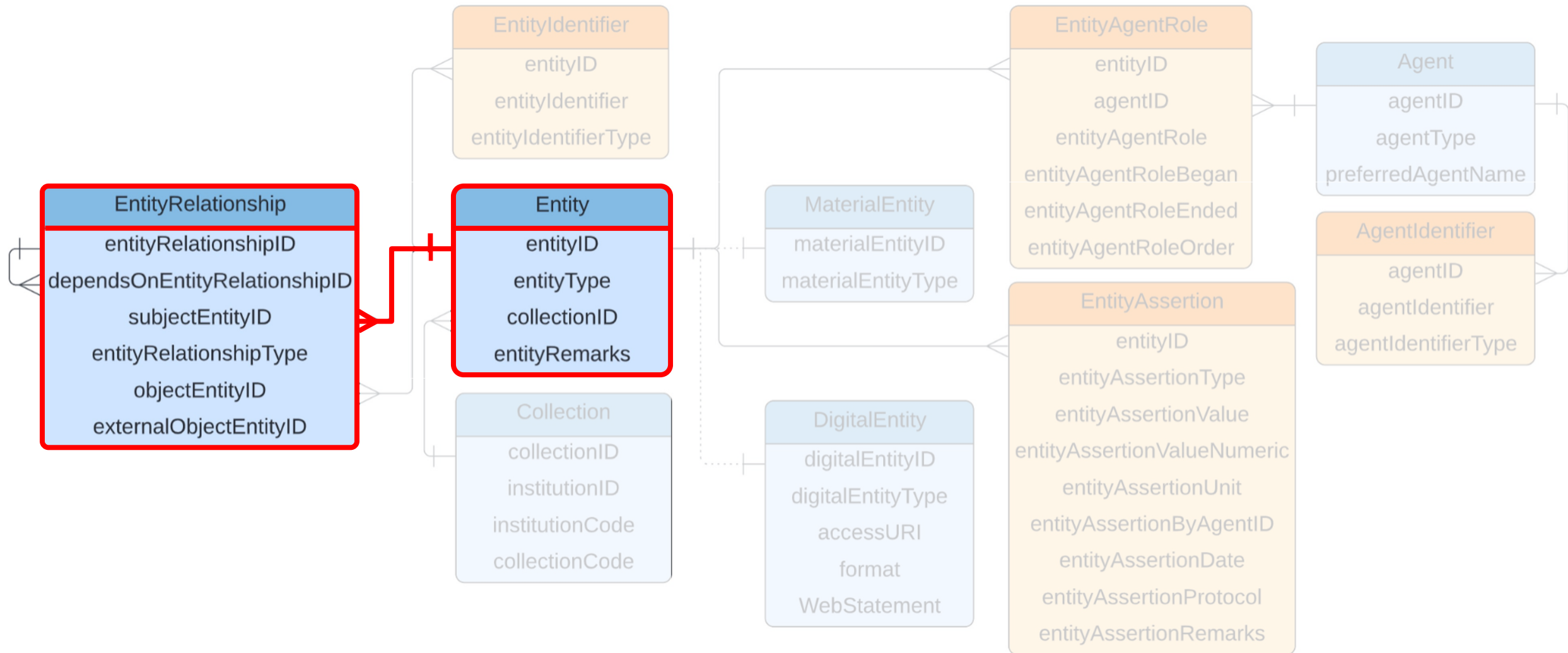
Relationships



Relationship	ID Type	ID Value	Link
<a href="#">host of</a>	<a href="#">DMNS:Para</a>	64	<a href="http://arctos.database.museum/guid/DMNS:Para:64">http://arctos.database.museum/guid/DMNS:Para:64</a> 
<a href="#">host of</a>	<a href="#">DMNS:Para</a>	65	<a href="http://arctos.database.museum/guid/DMNS:Para:65">http://arctos.database.museum/guid/DMNS:Para:65</a> 
<a href="#">host of</a>	<a href="#">DMNS:Para</a>	664	<a href="http://arctos.database.museum/guid/DMNS:Para:664">http://arctos.database.museum/guid/DMNS:Para:664</a> 

<http://arctos.database.museum/guid/DMNS:Mamm:11098>

# Arctos Case Study: Relationships between Specimens



Diversifying the GBIF Data Model: <https://tinyurl.com/diversifying-gbif-data>



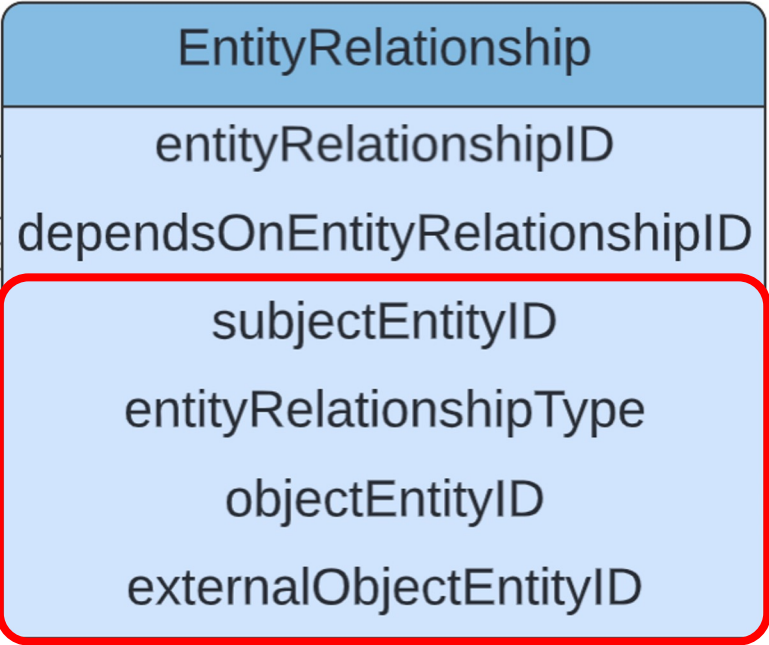
# Arctos Chipmunk: Specimen Relationships

EntityRelationship
entityRelationshipID
dependsOnEntityRelationshipID
subjectEntityID
entityRelationshipType
objectEntityID
externalObjectEntityID

Relationship	ID Type	ID Value	Link
<u>host of</u>	<u>DMNS:Para</u>	64	<a href="http://arctos.database.museum/guid/DMNS:Para:64">http://arctos.database.museum/guid/DMNS:Para:64</a>
<u>host of</u>	<u>DMNS:Para</u>	65	<a href="http://arctos.database.museum/guid/DMNS:Para:65">http://arctos.database.museum/guid/DMNS:Para:65</a>
<u>host of</u>	<u>DMNS:Para</u>	664	<a href="http://arctos.database.museum/guid/DMNS:Para:664">http://arctos.database.museum/guid/DMNS:Para:664</a>

subject ***predicate*** object

# Arctos Chipmunk: Specimen Relationships



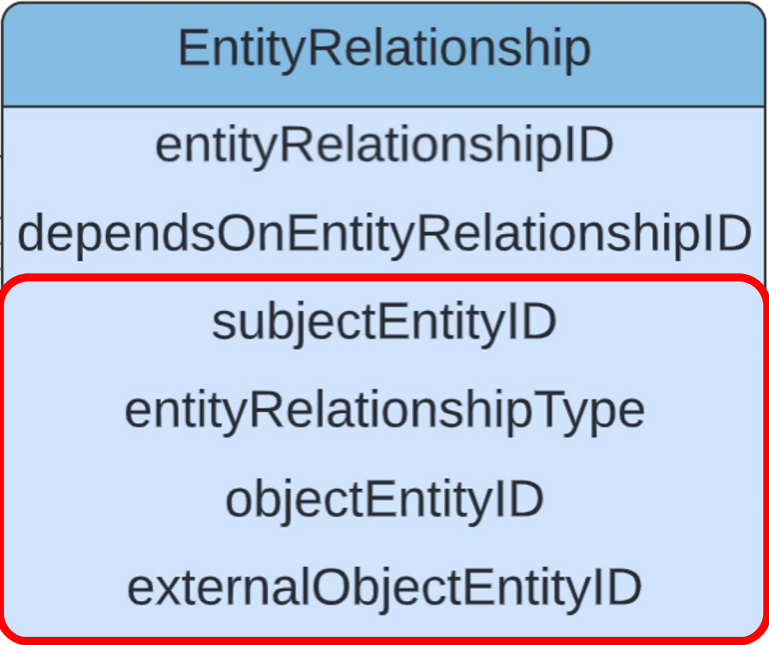
Relationship	ID Type	ID Value	Link
<a href="#">host of</a>	<a href="#">DMNS:Para</a>	64	<a href="http://arctos.database.museum/guid/DMNS:Para:64">http://arctos.database.museum/guid/DMNS:Para:64</a>
<a href="#">host of</a>	<a href="#">DMNS:Para</a>	65	<a href="http://arctos.database.museum/guid/DMNS:Para:65">http://arctos.database.museum/guid/DMNS:Para:65</a>
<a href="#">host of</a>	<a href="#">DMNS:Para</a>	664	<a href="http://arctos.database.museum/guid/DMNS:Para:664">http://arctos.database.museum/guid/DMNS:Para:664</a>

subject *predicate* object

subjectEntityID *entityRelationshipType* objectEntityID

subjectEntityID *entityRelationshipType* externalObjectEntityID

# Arctos Chipmunk: Specimen Relationships



Relationship	ID Type	ID Value	Link
<u>host of</u>	<u>DMNS:Para</u>	64	<a href="http://arctos.database.museum/guid/DMNS:Para:64">http://arctos.database.museum/guid/DMNS:Para:64</a>
<u>host of</u>	<u>DMNS:Para</u>	65	<a href="http://arctos.database.museum/guid/DMNS:Para:65">http://arctos.database.museum/guid/DMNS:Para:65</a>
<u>host of</u>	<u>DMNS:Para</u>	664	<a href="http://arctos.database.museum/guid/DMNS:Para:664">http://arctos.database.museum/guid/DMNS:Para:664</a>

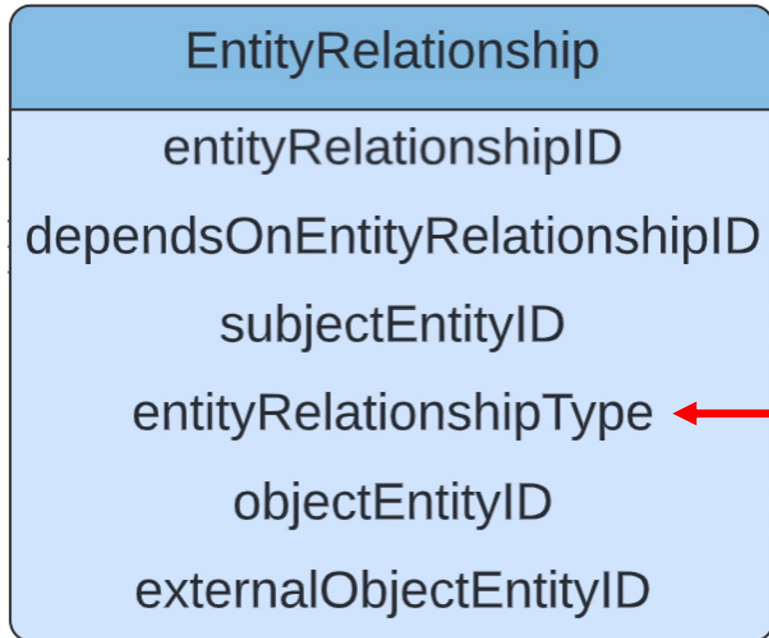
subject *predicate* object

subjectEntityID *entityRelationshipType* objectEntityID

subjectEntityID *entityRelationshipType* externalObjectEntityID

this chipmunk was the *host of* that flea

# Arctos Chipmunk: Specimen Relationships



## Chipmunk Relationships

Relationship	ID Type	ID Value	Link
<u>host of</u>	DMNS:Para	64	<a href="http://arctos.database.museum/guid/DMNS:Para:64">http://arctos.database.museum/guid/DMNS:Para:64</a>
<u>host of</u>	DMNS:Para	65	<a href="http://arctos.database.museum/guid/DMNS:Para:65">http://arctos.database.museum/guid/DMNS:Para:65</a>
<u>host of</u>	DMNS:Para	664	<a href="http://arctos.database.museum/guid/DMNS:Para:664">http://arctos.database.museum/guid/DMNS:Para:664</a>

## Parasite (664) Relationships

Relationship	ID Type	ID Value	Link
<u>collected with</u>	DMNS:Para	64	<a href="http://arctos.database.museum/guid/DMNS:Para:64">http://arctos.database.museum/guid/DMNS:Para:64</a>
<u>collected with</u>	DMNS:Para	65	<a href="http://arctos.database.museum/guid/DMNS:Para:65">http://arctos.database.museum/guid/DMNS:Para:65</a>
<u>parasite of</u>	DMNS:Mamm	11098	<a href="http://arctos.database.museum/guid/DMNS:Mamm:11098">http://arctos.database.museum/guid/DMNS:Mamm:11098</a>

subject *relationship* object

this chipmunk was the *host of* that flea

this flea was the *parasite of* that chipmunk



# Arctos Pearson's Chaco Mouse Specimen



Mammal Collection  
Museum of Southwestern Biology

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[Collection Details](#)  
[Loan Policy](#)

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**MSB:Mamm:55245**

***Andalgalomys pearsoni dorbignyi***

29.5 KM W ROBORE, 475 M; 18D19'S,  
60D02'W  
South America, Bolivia, Santa Cruz  
07-Oct-1984 (1984-10-07)

## Parts:

skin; skull; kidney; liver; liver; karyotype; liver; liver; skeleton; heart, kidney; karyotype; liver  
sample; liver sample

Comment or report bad  
data [\[0\]](#)[\[1\]](#)

[\[ expand all \]](#) [\[ collapse all \]](#)

## Identifications [\[ collapse \]](#)

[Andalgalomys pearsoni dorbignyi](#) [\[ link \]](#)

*Andalgalomys pearsoni dorbignyi* Olds, Anderson and Yates, 1987 *sensu* Olds et al. 1987  
Animalia, Chordata, Mammalia, Rodentia, Myomorpha, Cricetidae, Sigmodontinae, Andalgalomys, Andalgalomys  
pearsoni, Andalgalomys pearsoni dorbignyi  
*sensu* Olds et al. 1987

Identified by [Terry L. Yates](#) [\[ i \]](#), [Sydney Anderson](#) [\[ i \]](#) and [Nancy Olds](#) [\[ i \]](#) on 1987-09-04

Nature of ID: [features](#)

Confidence: [high](#)

Remarks: Former nature of id: type specimen.

[Andalgalomys pearsoni dorbignyi](#) [\[ link \]](#)

*sensu* Alhajeri and Steppan 2018  
Identified by [Scott J. Steppan](#) [\[ i \]](#) and [Bader Alhajeri](#) [\[ i \]](#) on 2018  
Nature of ID: [molecular](#)

Remarks: Former nature of id: molecular data.

[Andalgalomys pearsoni dorbignyi](#) [\[ link \]](#)

*sensu* Steppan et al. 2017  
Identified by [Scott J. Steppan](#) [\[ i \]](#), [Dorothee Huchon](#) [\[ i \]](#) and [John J. Schenk](#) [\[ i \]](#) on 2017  
Nature of ID: [molecular](#)

Remarks: Former nature of id: molecular data.

[Andalgalomys pearsoni dorbignyi](#) [\[ link \]](#)

*sensu* Alhajeri et al. 2016  
Identified by [Scott J. Steppan](#) [\[ i \]](#) and [Bader Alhajeri](#) [\[ i \]](#) on 2016  
Nature of ID: [molecular](#)

Remarks: Former nature of id: molecular data.

[Andalgalomys pearsoni dorbignyi](#) [\[ link \]](#)

*sensu* Martinez and Gardenal 2016  
Identified by [Cristina N. Gardenal](#) [\[ i \]](#) and [Juan J. Martinez](#) [\[ i \]](#) on 2016  
Nature of ID: [molecular](#)

## collector

[Bolivian Expedition 1984](#) [\[ i \]](#)

[Joseph A. Cook](#) [\[ i \]](#)

## preparator

[Joseph A. Cook](#) [\[ i \]](#)

[GBIF Occurrence](#) [\[ i \]](#)

[GBIF Occurrence](#) [\[ i \]](#)

[iDigBio Occurrence](#) [\[ i \]](#)

## Attributes

Attribute	Value	Determiner	Date	Method	Remark
<a href="#">ear from notch</a>	24 mm	<a href="#">Joseph A. Cook</a> <a href="#">[ i ]</a>	1984-10-07		
<a href="#">hind foot with claw</a>	27 mm	<a href="#">Joseph A. Cook</a> <a href="#">[ i ]</a>	1984-10-07		
<a href="#">reproductive data</a>	T=11mm	<a href="#">Joseph A. Cook</a> <a href="#">[ i ]</a>	1984-10-07		
<a href="#">sex</a>	male	<a href="#">Joseph A. Cook</a> <a href="#">[ i ]</a>	1984-10-07		
<a href="#">tail length</a>	123 mm	<a href="#">Joseph A. Cook</a> <a href="#">[ i ]</a>	1984-10-07		
<a href="#">total length</a>	246 mm	<a href="#">Joseph A. Cook</a> <a href="#">[ i ]</a>	1984-10-07		
<a href="#">weight</a>	45 g	<a href="#">Joseph A. Cook</a> <a href="#">[ i ]</a>	1984-10-07		

Remarks: PLUS ET, ENDO, CHROM

## Accession

View [1985.097.Mamm](#)

Diversifying the GBIF Data Model: <https://arctos.database.museum/guid/MSB:Mamm:55245>

Arctos Pearson's Chaco Mouse Specimen

Cataloged Item Specimen (Organism)



http://arctos.database.museum/guid/MSB:Mamm:55245

Identifications



Citations



Parts



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MSB:Mamm:55245

29.5 KM W ROBORE, 475 M; 18D19'S, 60D02'W

South America, Bolivia, Santa Cruz

07-Oct-1984 (1984-10-07)

License: [Arctos Data Ownership and Use](#)

Terms: [Arctos Data Ownership and Use](#)

[Collection Details](#)

[Loan Policy](#)

Log In

Parts:

skin; skull; kidney; liver; liver; karyotype; liver; liver; skeleton; heart; kidney; karyotype; liver sample; liver sample

Comment or report bad data

[0][1]

[ expand all ] [ collapse all ]

Identifications [ collapse ]

Andalgalomys pearsoni dorbignyi [ link ]

Andalgalomys pearsoni dorbignyi Olds, Anderson and Yates, 1987 sensu Olds et al. 1987

Animalia, Chordata, Mammalia, Rodentia, Myomorpha, Cricetidae, Sigmodontinae, Andalgalomys, Andalgalomys pearsoni, Andalgalomys pearsoni dorbignyi

sensu Olds et al. 1987

Identified by Terry L. Yates, Sydney Anderson and Nancy Olds on 1987-09-04

Nature of ID: features

Confidence: high

Remarks: Former nature\_of\_id: type specimen.

Andalgalomys pearsoni dorbignyi [ link ]

sensu Alhajeri and Steppan 2018

Identified by Scott J. Steppan and Bader Alhajeri on 2018

Nature of ID: molecular

Remarks: Former nature\_of\_id: molecular data.

Andalgalomys pearsoni dorbignyi [ link ]

sensu Steppan et al. 2017

Identified by Scott J. Steppan, Dorothee Huchon and John J. Schenk on 2017

Nature of ID: molecular

Remarks: Former nature\_of\_id: molecular data.

Andalgalomys pearsoni dorbignyi [ link ]

sensu Alhajeri et al. 2016

Identified by Scott J. Steppan and Bader Alhajeri on 2016

Nature of ID: molecular

Remarks: Former nature\_of\_id: molecular data.

Andalgalomys pearsoni dorbignyi [ link ]

sensu Martinez and Gardenal 2016

Identified by Cristina N. Gardenal and Juan J. Martinez on 2016

Nature of ID: molecular

collector

[Bolivian Expedition 1984](#)

[Joseph A. Cook](#)

preparator

[Joseph A. Cook](#)

[GBIF Occurrence](#)

[GBIF Occurrence](#)

[iDigBio Occurrence](#)

Attributes

Attribute	Value	Determiner	Date	Method	Remark
ear from notch	24 mm	<a href="#">Joseph A. Cook</a>	1984-10-07		
hind foot with claw	27 mm	<a href="#">Joseph A. Cook</a>	1984-10-07		
reproductive data	T=11mm	<a href="#">Joseph A. Cook</a>	1984-10-07		
sex	male	<a href="#">Joseph A. Cook</a>	1984-10-07		
tail length	123 mm	<a href="#">Joseph A. Cook</a>	1984-10-07		
total length	246 mm	<a href="#">Joseph A. Cook</a>	1984-10-07		
weight	45 g	<a href="#">Joseph A. Cook</a>	1984-10-07		

Remarks: PLUS ET, ENDO, CHROM

Accession

View 1985.097.Mamm

# Arctos Pearson's Chaco Mouse: Specimen Identifications

Cataloged Item  
Specimen  
(Organism)



Identifications



Citations



Parts



<http://arctos.database.museum/guid/MSB:Mamm:55245>

[Andalgalomys pearsoni dorbignyi](#) [ link ]

*Andalgalomys pearsoni dorbignyi* Olds, Anderson and Yates, 1987 *sensu* [Olds et al. 1987](#)

Animalia, Chordata, Mammalia, Rodentia, Myomorpha, Cricetidae, Sigmodontinae, Andalgalomys, Andalgalomys pearsoni, Andalgalomys pearsoni dorbignyi

*sensu* [Olds et al. 1987](#)

Identified by [Terry L. Yates](#) , [Sydney Anderson](#)  and [Nancy Olds](#)  on 1987-09-04

Nature of ID: [features](#)

Confidence: [high](#)

Remarks: Former nature\_of\_id: type specimen.

[Andalgalomys pearsoni dorbignyi](#) [ link ]

*sensu* [Alhajeri and Steppan 2018](#)

Identified by [Scott J. Steppan](#)  and [Bader Alhajeri](#)  on 2018

Nature of ID: [molecular](#)

Remarks: Former nature\_of\_id: molecular data.

[Andalgalomys pearsoni dorbignyi](#) [ link ]

*Graomys pearsoni dorbignyi*

*sensu* [Anderson 1997](#)

Identified by [Sydney Anderson](#) 

Nature of ID: [features](#)

Confidence: [high](#)

Remarks: Former nature\_of\_id: type specimen.

[Andalgalomys pearsoni dorbignyi](#) [ link ]

*sensu* [Musser and Carleton 2005](#)

Identified by [Michael D. Carleton](#)  and [Guy Graham Musser](#) 

Nature of ID: [features](#)

Confidence: [high](#)

Remarks: Former nature\_of\_id: type specimen.



# Arctos Pearson's Chaco Mouse: Specimen Identifications

Cataloged Item  
Specimen  
(Organism)



Identifications



Citations



Parts



<http://arctos.database.museum/guid/MSB:Mamm:55245>

[Andalgalomys pearsoni dorbignyi](#) [ link ]

*Andalgalomys pearsoni dorbignyi* Olds, Anderson and Yates, 1987 *sensu* [Olds et al. 1987](#)

Animalia, Chordata, Mammalia, Rodentia, Myomorpha, Cricetidae, Sigmodontinae, Andalgalomys, Andalgalomys pearsoni, Andalgalomys pearsoni dorbignyi

*sensu* [Olds et al. 1987](#)

Identified by [Terry L. Yates](#) , [Sydney Anderson](#)  and [Nancy Olds](#)  on 1987-09-04

Nature of ID: [features](#)

Confidence: [high](#)

Remarks: Former nature\_of\_id: type specimen.

[Andalgalomys pearsoni dorbignyi](#) [ link ]

*sensu* [Alhajeri and Steppan 2018](#)

Identified by [Scott J. Steppan](#) , and [Bader Alhajeri](#)  on 2018

Nature of ID: [molecular](#)

Remarks: Former nature\_of\_id: molecular data.

[Andalgalomys pearsoni dorbignyi](#) [ link ]

*Graomys pearsoni dorbignyi*

*sensu* [Anderson 1997](#)

Identified by [Sydney Anderson](#) 

Nature of ID: [features](#)

Confidence: [high](#)

Remarks: Former nature\_of\_id: type specimen.

[Andalgalomys pearsoni dorbignyi](#) [ link ]

*sensu* [Musser and Carleton 2005](#)

Identified by [Michael D. Carleton](#) , and [Guy Graham Musser](#) 

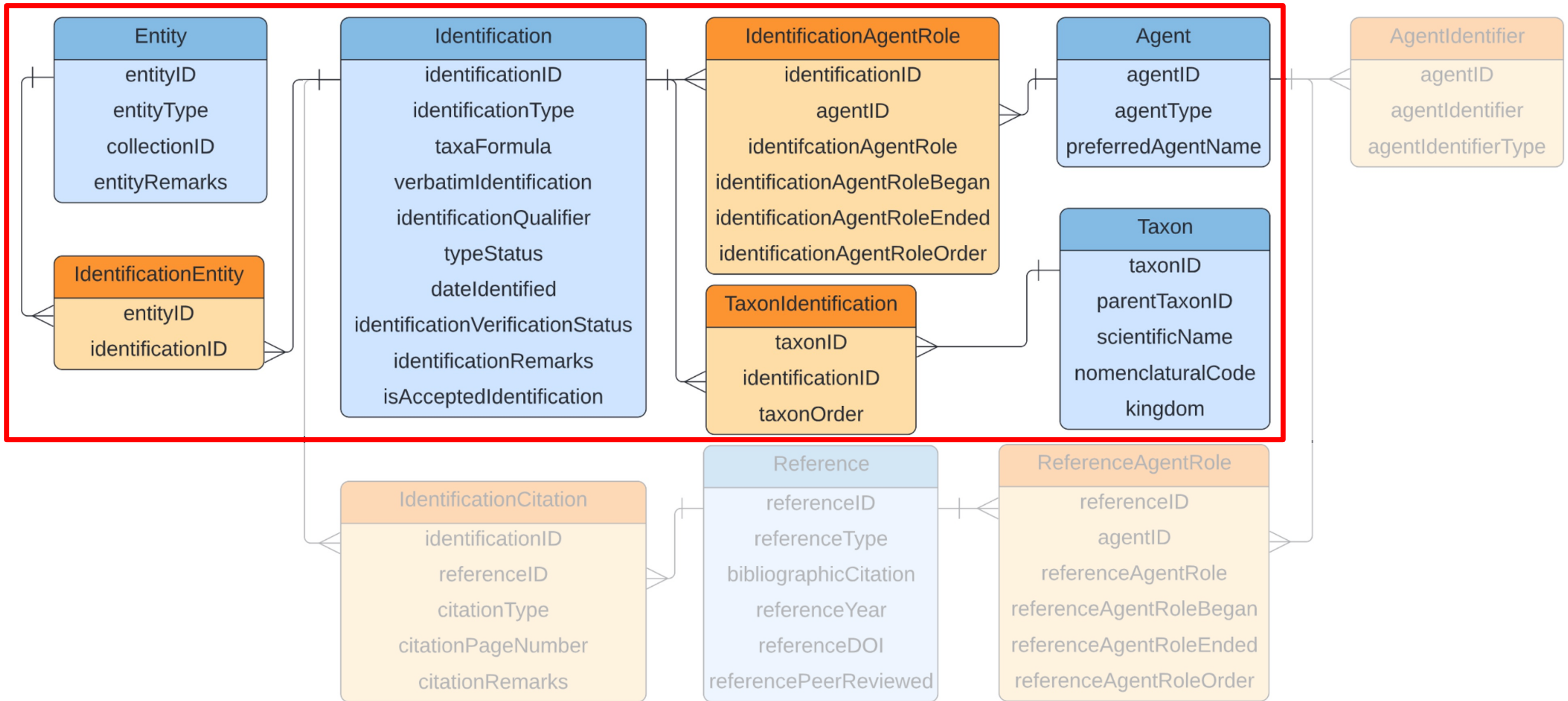
Nature of ID: [features](#)

Confidence: [high](#)

Remarks: Former nature\_of\_id: type specimen.



# Arctos Case Study: Taxonomic Identifications



Diversifying the GBIF Data Model: <https://tinyurl.com/diversifying-gbif-data>

# Arctos Pearson's Chaco Mouse: Specimen Citations

Cataloged Item  
Specimen  
(Organism)



Identifications



Citations



Parts



<http://arctos.database.museum/guid/MSB:Mamm:55245>

**voucher** of *Andalgalomys pearsoni dorbignyi* , page 1015 in Alvarado-Serrano and D'Elia 2013 [DOI:10.1644/12-MAMM-A-276.1](https://doi.org/10.1644/12-MAMM-A-276.1)

**voucher** of *Andalgalomys pearsoni* , page 771 in Haag et al. 2007   
Cited using GenBank AF159285

**voucher** of *Andalgalomys pearsoni dorbignyi* in Pardinas et al 2014  
figure 8 in supplementary

**voucher** of *Andalgalomys pearsoni* in Weir and Schluter 2007 [DOI:10.1126/science.1135590](https://doi.org/10.1126/science.1135590)

used as genetic data for tropical sister species. Supporting Online Material  
[www.sciencemag.org/cgi/content/full/315/5818/1574/DC1](http://www.sciencemag.org/cgi/content/full/315/5818/1574/DC1)

**voucher** of *Andalgalomys pearsoni dorbignyi* , page 651 in Martínez and Gardenal 2016  
[DOI:10.1111/bj.12767](https://doi.org/10.1111/bj.12767)

Cited as JQ434418, AY963176, JQ434398

**voucher** of *Andalgalomys pearsoni dorbignyi* in Zeballos et al 2014 [DOI:10.15450/rmm141001](https://doi.org/10.15450/rmm141001)

**voucher** of *Andalgalomys pearsoni* in Martínez et al. 2012 [DOI:10.1007/s13364-011-0070-9](https://doi.org/10.1007/s13364-011-0070-9)

**voucher** of *Andalgalomys pearsoni dorbignyi* , page 370 in Dunnum and Cook 2012  
[DOI:10.1515/mammalia-2012-0071](https://doi.org/10.1515/mammalia-2012-0071)

**voucher** of *Andalgalomys pearsoni dorbignyi* , page 184 in Pardinas et al 2015  
Cited as KC953155, KC953241, KC953355, AY963176, JQ434418

**voucher** of *Andalgalomys pearsoni* , page 356 in D'elía et al. 2003 [DOI:10.1078/1616-5047-00104](https://doi.org/10.1078/1616-5047-00104)

**voucher** of *Andalgalomys pearsoni dorbignyi* , page 434 in MACHADO et al. 2015  
[DOI:10.11646/zootaxa.3986.4.2](https://doi.org/10.11646/zootaxa.3986.4.2)

**holotype** of *Andalgalomys pearsoni dorbignyi* , page 9 in Olds et al. 1987

**voucher** of *Graomys pearsoni dorbignyi* , page 461 in Anderson 1997

**referral** of *Andalgalomys pearsoni dorbignyi* in Arctos 2010

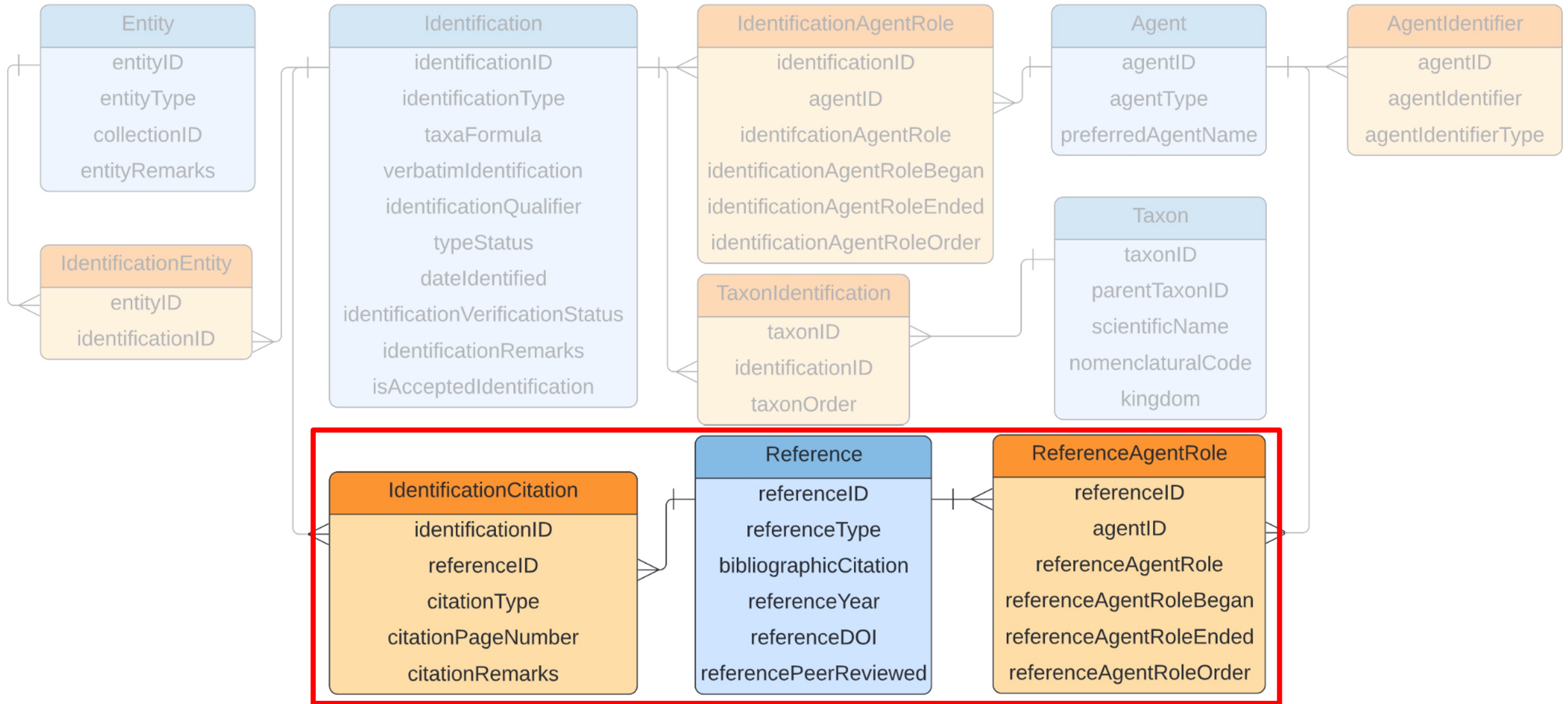
**voucher** of *Andalgalomys pearsoni dorbignyi* , page 1101 in Musser and Carleton 2005

**voucher** of *Andalgalomys pearsoni dorbignyi* , page 327 in Alhajer and Steppan 2018  
[DOI:10.1007/s11692-018-9453-z](https://doi.org/10.1007/s11692-018-9453-z)

Cited as *Andalgalomys pearsoni* in tree

**voucher** of *Andalgalomys pearsoni* , page 241 in D'elia et al. 2005

# Arctos Case Study: Specimen Citations



Diversifying the GBIF Data Model: <https://tinyurl.com/diversifying-gbif-data>

# Arctos Pearson's Chaco Mouse: Specimen Parts

Cataloged Item  
Specimen  
(Organism)



Identifications



Citations



Parts

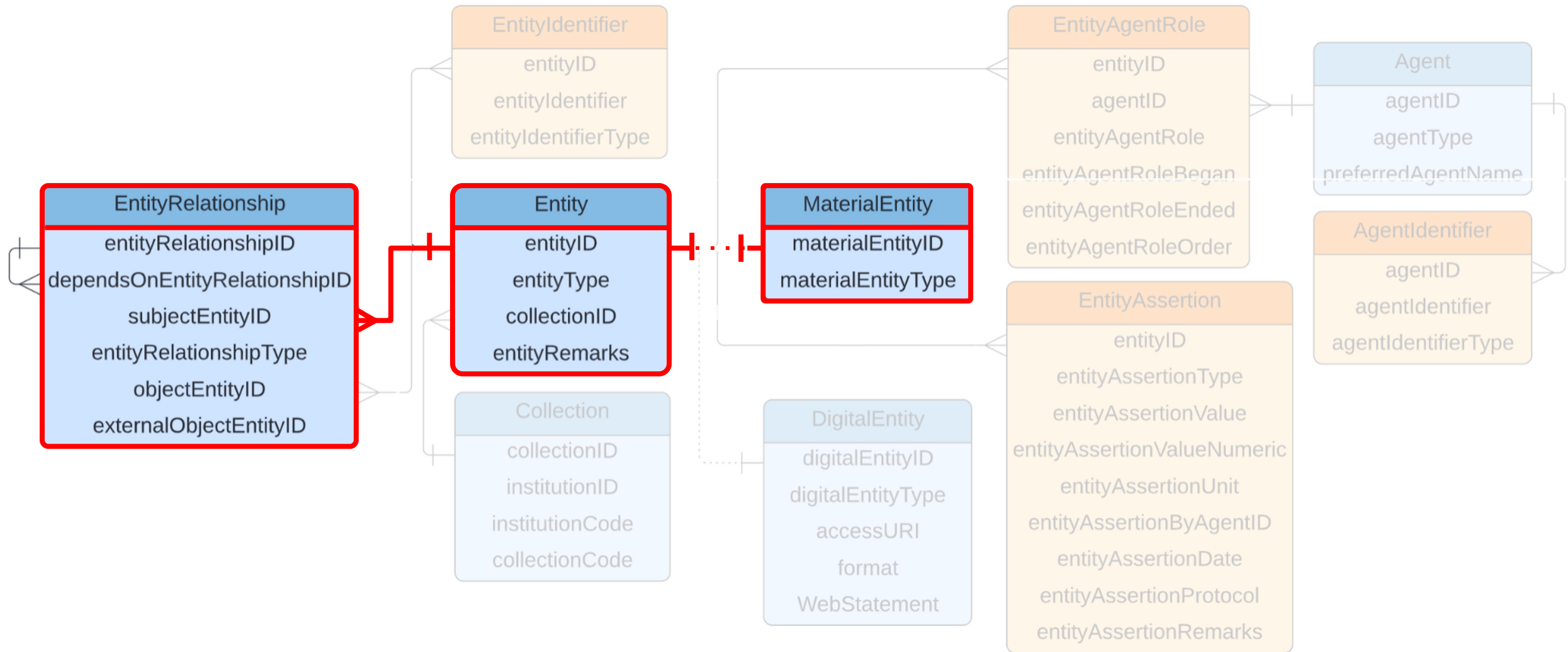


<http://arctos.database.museum/guid/MSB:Mamm:55245>

Part Name	Condition	Disposition	Qty	Remarks
<u>skull</u>	excellent	<u>in collection</u>	1	In type case
<u>skeleton</u>	good	<u>unknown</u>	1	In type case; Original part name: skeleton, postcranial
<u>skin</u>	excellent	<u>unknown</u>	1	In type case
<u>liver</u>	good	<u>in collection</u>	1	
<u>liver</u>	good	<u>on loan</u>	1	
<u>kidney</u>	good	<u>in collection</u>	1	
<u>karyotype</u>	good	<u>in collection</u>	1	

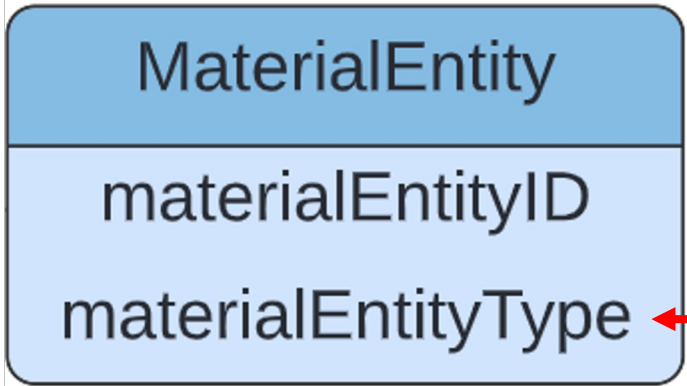


# Arctos Case Study: Specimen-Part Relationships



Diversifying the GBIF Data Model: <https://tinyurl.com/diversifying-gbif-data>

Arctos Pearson's Chaco Mouse: Specimen Parts



Part Name	Condition	Disposition	Qty	Remarks
<u>skull</u>	excellent	<u>in collection</u>	1	In type case
<u>skeleton</u>	good	<u>unknown</u>	1	In type case; Original part name: skeleton, postcranial
<u>skin</u>	excellent	<u>unknown</u>	1	In type case
<u>liver</u>	good	<u>in collection</u>	1	
<u>liver</u>	good	<u>on loan</u>	1	
<u>kidney</u>	good	<u>in collection</u>	1	
<u>karyotype</u>	good	<u>in collection</u>	1	

# Arctos Pearson's Chaco Mouse: Specimen Parts

EntityAssertion

entityID

entityAssertionType

entityAssertionValue

entityAssertionValueNumeric

entityAssertionUnit

entityAssertionByAgentID

entityAssertionDate

entityAssertionProtocol

entityAssertionRemarks

Part Name	Condition	Disposition	Qty	Remarks
<u>skull</u>	excellent	<u>in collection</u>	1	In type case
<u>skeleton</u>	good	<u>unknown</u>	1	In type case; Original part name: skeleton, postcranial
<u>skin</u>	excellent	<u>unknown</u>	1	In type case
<u>liver</u>	good	<u>in collection</u>	1	

## Arctos Pearson's Chaco Mouse: Specimen Parts

EntityAssertion

entityID

entityAssertionType

entityAssertionValue

entityAssertionValueNumeric

entityAssertionUnit

entityAssertionByAgentID

entityAssertionDate

entityAssertionProtocol

entityAssertionRemarks

Attribute	Value	Date	Dtr.	Rmk.	Mth.
<u>preservation</u>	<u>frozen</u>	2021-07-01		Added from original part liver (frozen).	

Attribute	Value	Date	Dtr.	Rmk.	Mth.
<u>preservation</u>	<u>frozen</u>	2021-07-01		Added from original part liver (frozen).	

Attribute	Value	Date	Dtr.	Rmk.	Mth.
<u>preservation</u>	<u>frozen</u>	2021-07-01		Added from original part kidney (frozen).	

Attribute	Value	Date	Dtr.	Rmk.	Mth.
<u>preservation</u>	<u>frozen</u>	2021-07-01		Added from original part karyotype (frozen).	



Arctos Pearson's Chaco Mouse: Specimen Parts

EntityAssertion

entityID

entityAssertionType

entityAssertionValue

entityAssertionValueNumeric

entityAssertionUnit

entityAssertionByAgentID

entityAssertionDate

entityAssertionProtocol

entityAssertionRemarks

Attribute	Value	Date	Dtr.	Rmk.	Mth.
preservation	frozen	2021-07-01		Added from original part liver (frozen).	



# Arctos Cultural Heritage Specimen



Ethnology & History Collection  
University of Alaska Museum of the North

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UAM:EH:UA67-133-0001

**Parka, Fur**

King Island

North America, United States, Alaska

1930

Parts:

object; media

Comment or report bad data

[0][0]

[ expand all ] [ collapse all ]

Identifications [\[ collapse \]](#)

Parka, Fur [\[ link \]](#)

[Rangifer tarandus](#)  
[Phocidae](#)  
[Canis lupus](#)  
[Gulo gulo](#)  
[Neovison vison](#)

Phocidae; *Gulo gulo* (Linnaeus, 1758); *Canis lupus* Linnaeus, 1758; *Rangifer tarandus* (Linnaeus, 1758); *Neovison vison* (Schreber, 1777)  
Animalia, Chordata, Mammalia, Carnivora, Caniformia, Mustelidae, Mustelinae, Neovison, Neovison vison;  
Animalia, Chordata, Mammalia, Artiodactyla, Ruminantia, Cervidae, Rangifer, Rangifer tarandus; Animalia,  
American Mink; American mink; Arctic wolf; Bheriya; Bighana; Canadian wolf; Common Wolf; Dheeb; Eléphant De  
Mer Du Sud; Farkas; Focas; Gray wolf; Grey Wolf; Hunt; Kurt; Lobo; Lobo comum; Lobo común; Lobo gris; Loup;

Identified by unknown

Nature of ID: [unknown](#)

Remarks: Former nature\_of\_id: legacy.

[collector](#)  
[Mrs. Hortense W. Lewis](#)

[creator](#)  
[Aisana](#)

Attributes [\[ collapse \]](#)

Attribute	Value	Determiner	Date	Method	Remark
<a href="#">culture of origin</a>	<a href="#">Iñupiaq</a>	<a href="#">unknown</a>	2014-09-30		
<a href="#">culture of use</a>	<a href="#">Iñupiaq</a>	<a href="#">unknown</a>	2014-09-30		
<a href="#">description</a>	Spotted reindeer fur woman's parka with white as primary color on the front, brown on the back. Hood has a sunburst ruff of wolf fur, a narrow strip of sealskin, and a strip of clipped reindeer. Gussets are in white reindeer, set into the dark fur around them. Cuffs and bottom hem trimmed with wolverine. Tassles of mink's tails hang from the front (2), at the shoulders (4 each side), and on top of the hood (2). For the most part, the front is one piece of fur, thought patches of fur have been incorporated into the body	<a href="#">unknown</a>	2014-09-30		

Media linked to this Cataloged Item.

Showing results 1 - 1 of 1 [Media Gallery](#)

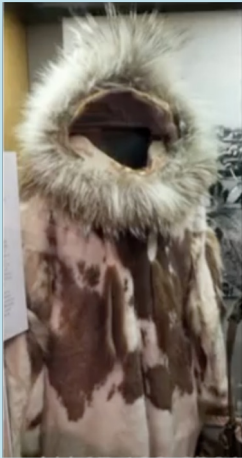


[image \(image/jpeg\)](#)  
[Media Details](#)  
[CC BY-NC-ND](#)  
shows object on exhibit

Diversifying the GBIF Data Model: <https://arctos.database.museum/guid/UAM:EH:UA67-133-0001>

# Arctos Cultural Heritage Specimen

## Cataloged Item (Organisms)



## Identifications



## Events



## Media



<https://arctos.database.museum/guid/UAM:EH:UA67-133-0001>



## Ethnology & History Collection University of Alaska Museum of the North

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**UAM:EH:UA67-133-0001**

**Parka, Fur**

**King Island**  
North America, United States, Alaska  
1930

**Parts:**  
object; media

License: [CC BY-NC](#)  
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[\[ expand all \]](#) [\[ collapse all \]](#)

Identifications [\[ collapse \]](#)

**Parka, Fur** [\[ link \]](#)

[Rangifer tarandus](#)

[Phocidae](#)

[Canis lupus](#)

[Gulo gulo](#)

[Neovison vison](#)

[Phocidae](#); [Gulo gulo](#) (Linnaeus, 1758); [Canis lupus](#) Linnaeus, 1758; [Rangifer tarandus](#) (Linnaeus, 1758); [Neovison vison](#) (Schreber, 1777)

[Animalia](#), [Chordata](#), [Mammalia](#), [Carnivora](#), [Caniformia](#), [Mustelidae](#), [Mustelinae](#), [Neovison](#), [Neovison vison](#); [Animalia](#), [Chordata](#), [Mammalia](#), [Artiodactyla](#), [Ruminantia](#), [Cervidae](#), [Rangifer](#), [Rangifer tarandus](#); [Animalia](#), [American Mink](#); [American mink](#); [Arctic wolf](#); [Bheriya](#); [Bighana](#); [Canadian wolf](#); [Common Wolf](#); [Dheeb](#); [Eléphant De Mer Du Sud](#); [Farkas](#); [Focas](#); [Gray wolf](#); [Grey Wolf](#); [Hunt](#); [Kurt](#); [Lobo](#); [Lobo comum](#); [Lobo común](#); [Lobo gris](#); [Loup](#);

Identified by unknown

Nature of ID: [unknown](#)

Remarks: Former nature\_of\_id: legacy.

[collector](#)

[Mrs. Hortense W. Lewis](#)

[creator](#)

[Aisana](#)

Attributes [\[ collapse \]](#)

Attribute	Value	Determiner	Date	Method	Remark
<a href="#">culture of origin</a>	<a href="#">Iñupiaq</a>	<a href="#">unknown</a>	2014-09-30		
<a href="#">culture of use</a>	<a href="#">Iñupiaq</a>	<a href="#">unknown</a>	2014-09-30		
<a href="#">description</a>	Spotted reindeer fur woman's parka with white as primary color on the front, brown on the back. Hood has a sunburst ruff of wolf fur, a narrow strip of sealskin, and a strip of clipped reindeer. Gussets are in white reindeer, set into the dark fur around them. Cuffs and bottom hem trimmed with wolverine. Tassles of mink's tails hang from the front (2), at the shoulders (4 each side), and on top of the hood (2). For the most part, the front is one piece of fur, thought patches of fur have been incorporated into the body.				
		<a href="#">unknown</a>	2014-09-30		

Media linked to this Cataloged Item.

Showing results 1 - 1 of 1 [Media Gallery](#)



[image \(image/jpeg\)](#)

[Media Details](#)

[CC BY-NC-ND](#)

shows object on exhibit

# Arctos Cultural Heritage: Specimen Identifications

## Cataloged Item (Organisms)



## Identifications



## Events



## Media



Parka, Fur [\[ link \]](#)

[Rangifer tarandus](#)  
[Phocidae](#)  
[Canis lupus](#)  
[Gulo gulo](#)  
[Neovison vison](#)

*Phocidae*; *Gulo gulo* (Linnaeus, 1758); *Canis lupus* Linnaeus, 1758; *Rangifer tarandus* (Linnaeus, 1758);  
*Neovison vison* (Schreber, 1777)

Animalia, Chordata, Mammalia, Carnivora, Caniformia, Mustelidae, Mustelinae, Neovison, Neovison vison;

Animalia, Chordata, Mammalia, Artiodactyla, Ruminantia, Cervidae, Rangifer, Rangifer tarandus; Animalia,

American Mink; American mink; Arctic wolf; Bheriya; Bighana; Canadian wolf; Common Wolf; Dheeb; Eléphant De  
Mer Du Sud; Farkas; Focas; Gray wolf; Grey Wolf; Hunt; Kurt; Lobo; Lobo comum; Lobo común; Lobo gris; Loup;

Identified by unknown

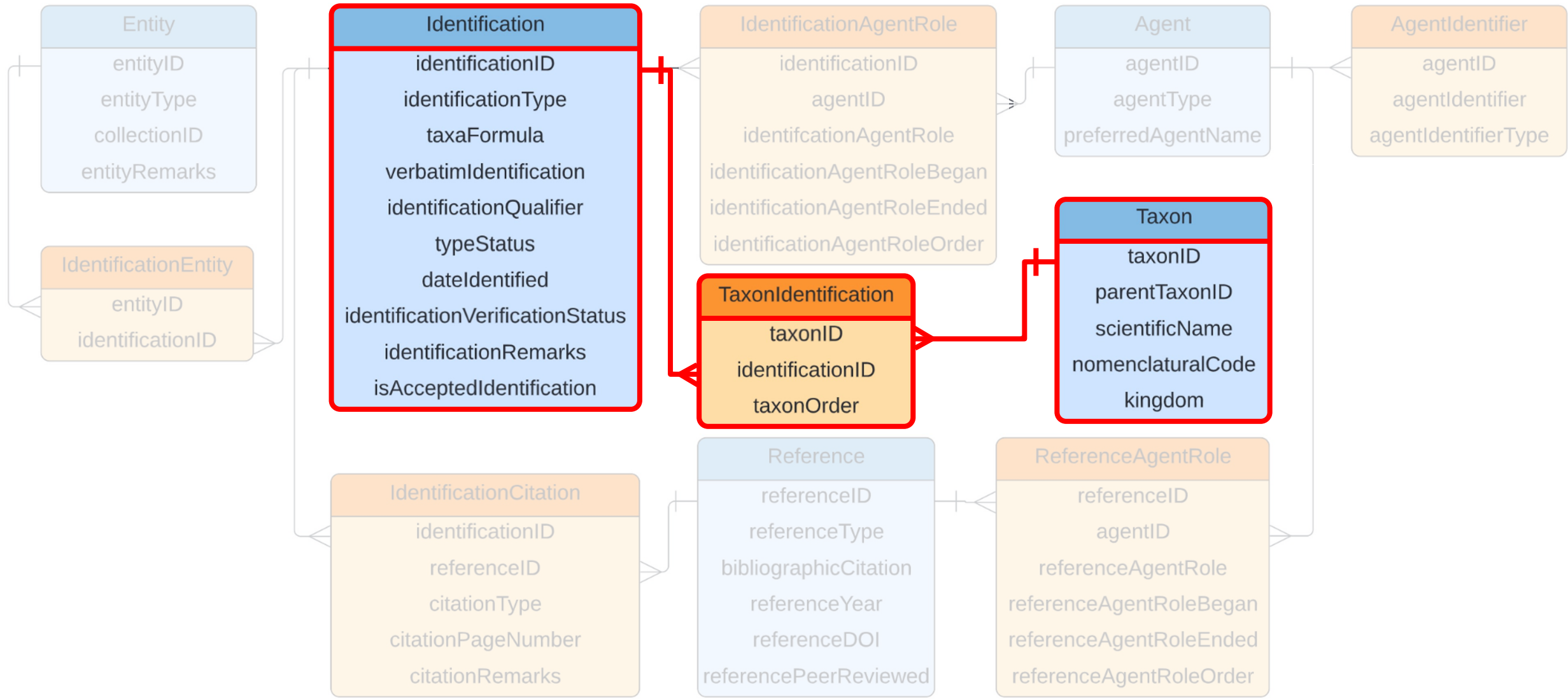
Nature of ID: [unknown](#)

Remarks: Former nature\_of\_id: legacy.

<https://arctos.database.museum/guid/UAM:EH:UA67-133-0001>



# Arctos Case Study: Complex Identifications



Diversifying the GBIF Data Model: <https://tinyurl.com/diversifying-gbif-data>

# Arctos Cultural Heritage: Specimen Events

## Cataloged Item (Organisms)



## Identifications



## Events



## Media



<https://arctos.database.museum/guid/UAM:EH:UA67-133-0001>

highlight linked components

Event Type: [use](#) assigned by [unknown](#) on 2014-10-01

Verification Status: [unverified](#)

Event Date: 1930 Verbatim Date: not recorded

Higher Geography: [North America, United States, Alaska](#) [source](#)

Specific Locality: [King Island](#)

Verbatim Locality: [King Island](#)

Associated Names: United States, United States of America, Alaska, Nome

Coordinates: 64.975 / -168.059722

primary\_spatial\_data: point-radius

Error: 5421 m

Georeference Source: GeoLocate

Georeference Protocol: [GeoLocate](#)



map key/tools

highlight linked components

Event Type: [creation](#) assigned by [Mrs. Hortense W. Lewis](#) on 2014-09-30

Verification Status: [unverified](#)

Event Date: 1930 Verbatim Date: 1930

Higher Geography: [North America, United States, Alaska](#) [source](#)

Specific Locality: [King Island](#)

Verbatim Locality: [King Island](#)

Associated Names: United States, United States of America, Alaska, Nome

Coordinates: 64.975 / -168.059722

primary\_spatial\_data: point-radius

Error: 5421 m

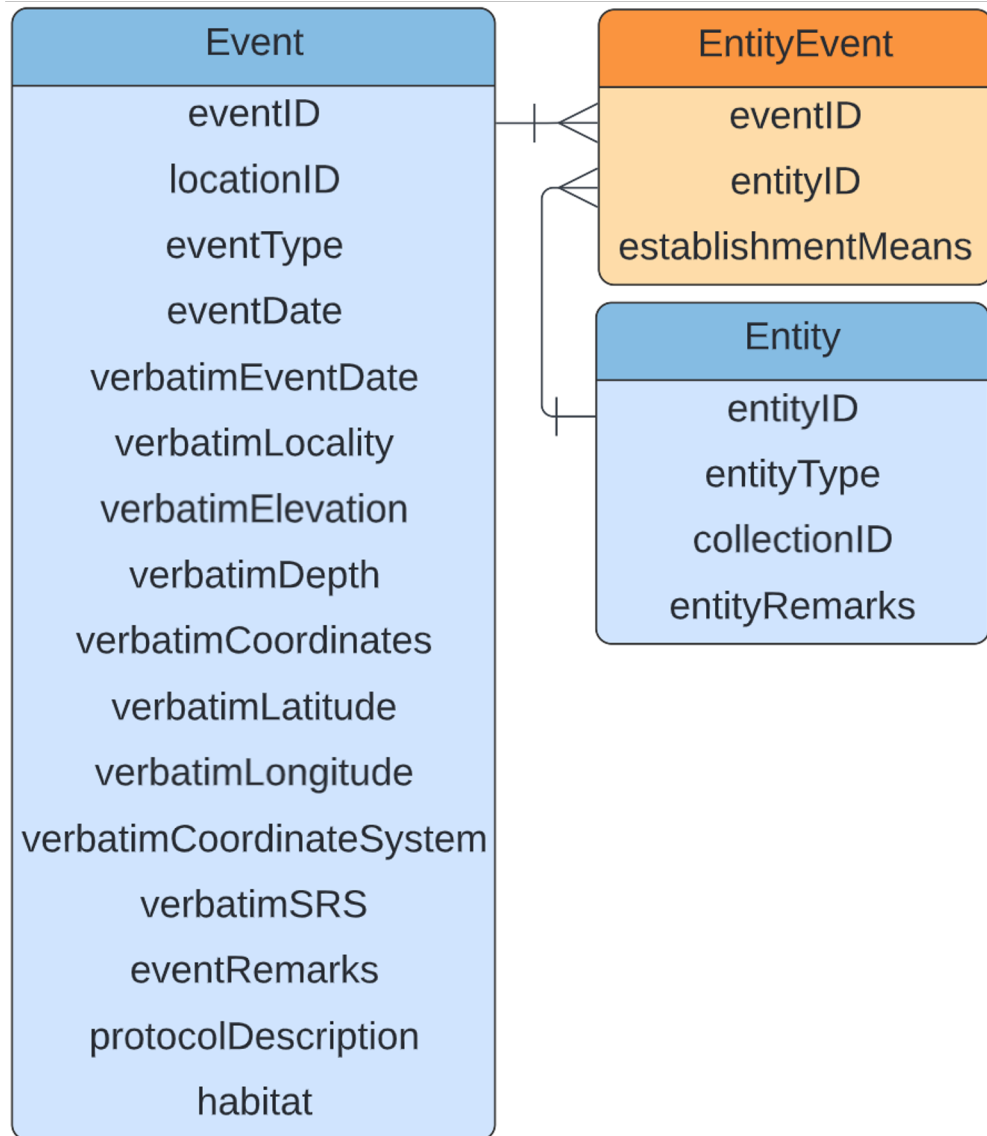
Georeference Source: GeoLocate

Georeference Protocol: [GeoLocate](#)



map key/tools

# Arctos Cultural Heritage: Specimen Events



highlight linked components

Event Type: [use](#) assigned by [unknown](#) on 2014-10-01  
Verification Status: [unverified](#)   
Event Date: 1930 Verbatim Date: not recorded  
Higher Geography: [North America, United States, Alaska](#) [source](#)   
Specific Locality: [King Island](#)   
Verbatim Locality: [King Island](#)   
Associated Names : United States, United States of America, Alaska, Nome  
Coordinates: 64.975 / -168.059722  
primary\_spatial\_data: point-radius  
Error: 5421 m  
Georeference Source: GeoLocate  
Georeference Protocol: [GeoLocate](#)



map key/tools

highlight linked components

Event Type: [creation](#) assigned by [Mrs. Hortense W. Lewis](#) on 2014-09-30  
Verification Status: [unverified](#)   
Event Date: 1930 Verbatim Date: 1930  
Higher Geography: [North America, United States, Alaska](#) [source](#)   
Specific Locality: [King Island](#)   
Verbatim Locality: [King Island](#)   
Associated Names : United States, United States of America, Alaska, Nome  
Coordinates: 64.975 / -168.059722  
primary\_spatial\_data: point-radius  
Error: 5421 m  
Georeference Source: GeoLocate  
Georeference Protocol: [GeoLocate](#)



map key/tools

# Arctos Cultural Heritage: Specimen Media

Media linked to this Cataloged Item.

Showing results 1 - 1 of 1

Media Gallery

Cataloged Item  
(Organisms)



Identifications



Events



Media



<https://arctos.database.museum/guid/UAM:EH:UA67-133-0001>



[image \(image/jpeg\)](#)

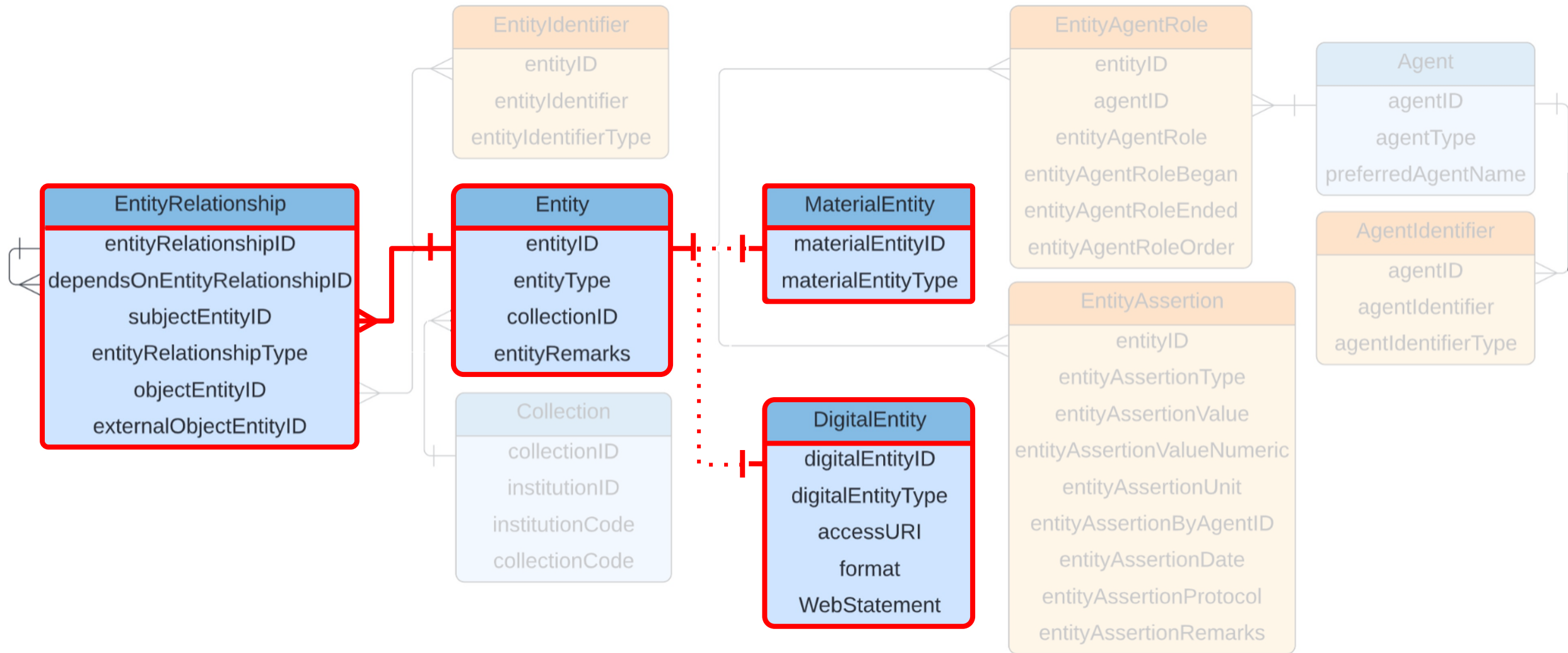
[Media Details](#)

[CC BY-NC-ND](#) 

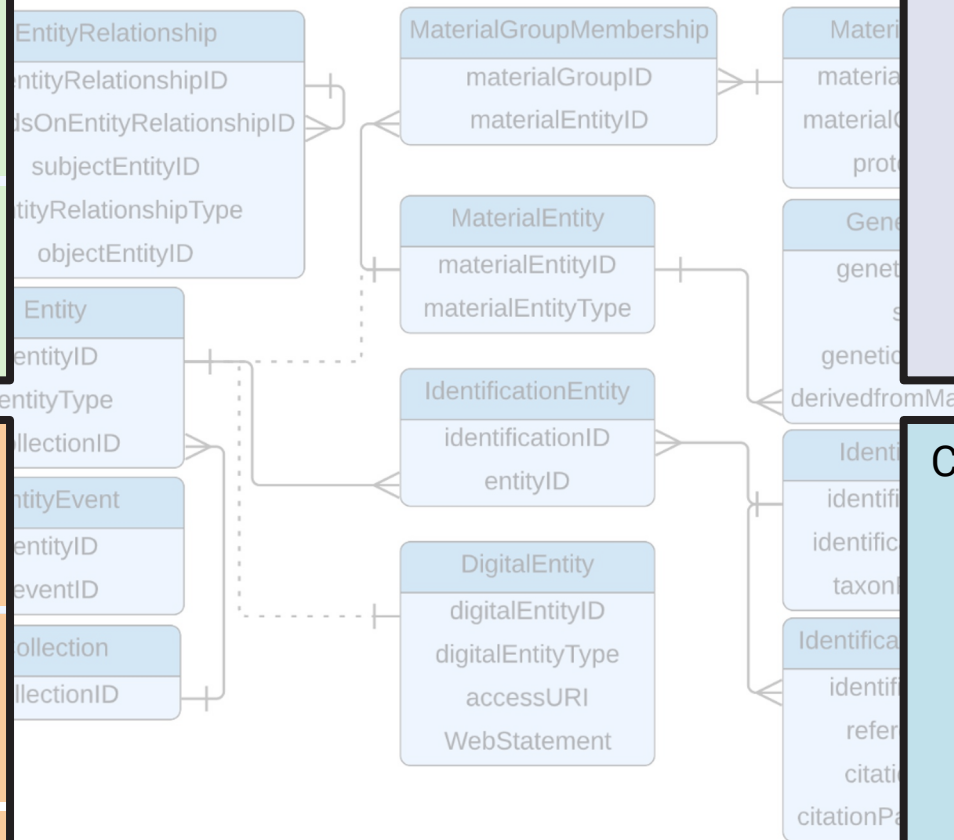
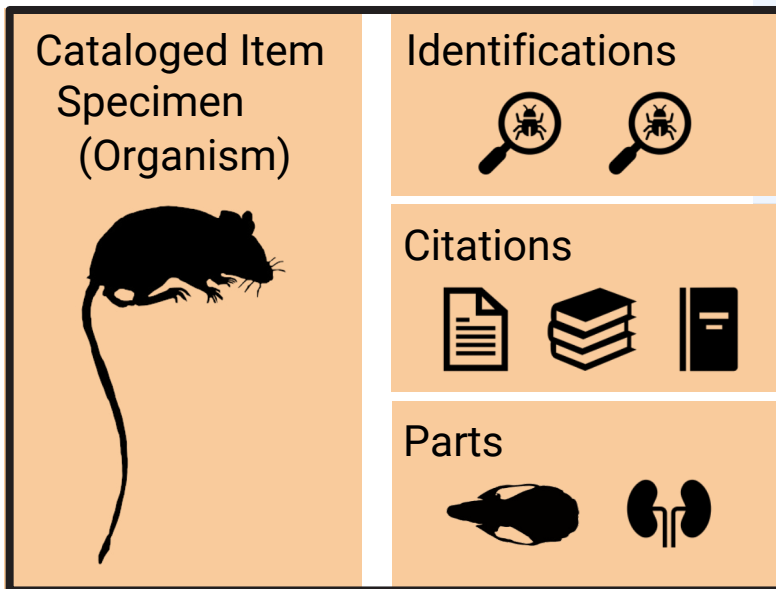
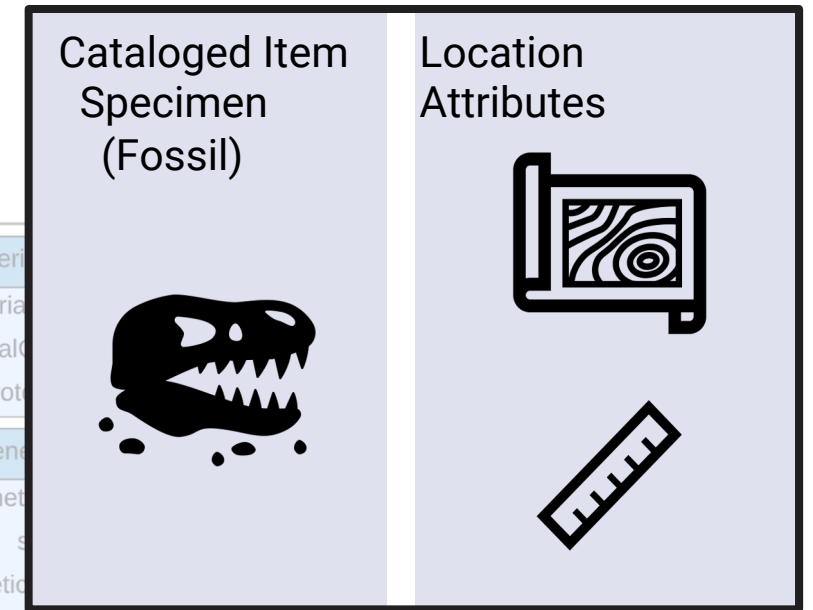
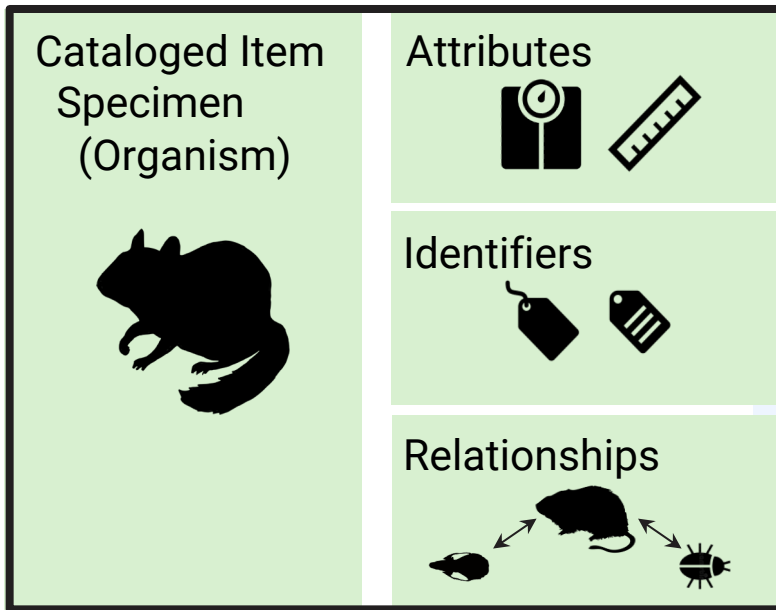
shows object on exhibit



# Arctos Case Study: Material and Digital Entity Relationships



Diversifying the GBIF Data Model: <https://tinyurl.com/diversifying-gbif-data>



Diversifying the GBIF Data Model: <https://tinyurl.com/diversifying-gbif-data>

# Thank you!

Cataloged Item  
Specimen  
(Organism)



Attributes



Identifiers



Relationships



Cataloged Item  
Specimen  
(Organism)



Identifications



Citations



Parts



Cataloged Item  
Specimen  
(Fossil)



Location  
Attributes



Cataloged Item  
(Organisms)



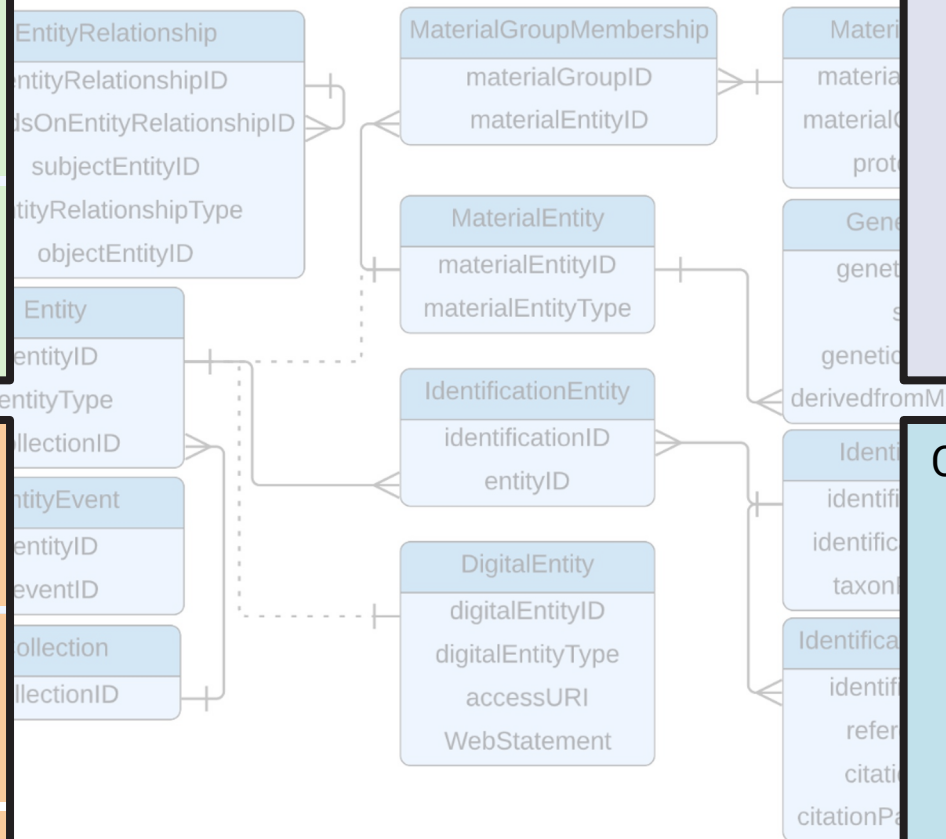
Identifications



Events



Media



Diversifying the GBIF Data Model: <https://tinyurl.com/diversifying-gbif-data>