	Task	Subtask	Dependencies	Description	Output	Milestone(s)	Duration (months)	Lead(s)	Participants	References	
1	Landscape and requirer	nents analysis		Research existing collections descriptions and assess which could be used or adapted. Define CD scope and requirements.	Landscape and requirements analysis		4				
1.1		Collection descriptions methodology crosswalk		Crosswalk of existing collections descriptions methodologies		Crosswalks ready	2	?	Mareike Petersen, Niels Raes	https://docs.google. com/spreadsheets/d/1qX18gn1puRXVAsmZHOE_Epnp9 5GdPUyZMaBpRpgU_e8/edit#gid=0	
1.2		Collections descriptions frameworks crosswalk		Crosswalk of existing and previous collections descriptions standards		Use cases collected	2	Niels Raes	Connie Rinaldo, Terry Catapano, Mareike Petersen, Mike Trizna, Niels Raes, Carolyn Sheffield	https://docs.google. com/spreadsheets/d/1qX18gn1puRXVAsmZHOE_Epnp9 5GdPUyZMaBpRpgU_e8/edit#gid=0	https://docs.google.com/document/d/1yT- yrKFgTVEkgM6BQiNox- YKLBEXVyHgoy5tQ0wxhc/edit#heading= h.vyegpnbo6ty
1.3		Identify breakdown dimensions	1.1, 1.2	Identify relevant dimensions for collections breakdowns (geographic, taxonomic, temporal etc)			2	? Niels Raes	Matt Woodburn, Mareike Petersen, Mike Trizna, Niels Raes		
1.4		Define scope of collection types	1.1, 1.2	Define initial scope of collections types to be supported (specimens, observations, field notes, media, datasets etc)			2	?	?	from DP: document that this topic is decided. Needs to be formally written up. Initial scope is physical objects in a collection (not datasets, not observations).	
2	Communication plan			Design and implement a communication plan for the task group	Communication plan		0.75				
2.1		Create communication plan		Create and document a group communication plan			0.75	?	Deborah Paul, Matt Woodburn		
2.2		Update group charter		Add details to the public group charter			0.75	?	Deborah Paul, Matt Woodburn		
3	3 Data model			High level data model to define entities and relationships, informed by and tested against use cases	Data model definition document	Data model finalised	6				
3.1		Develop high level data model	1.1, 1.2	Develop a data model to support:  1. Recursive, dynamic breakdowns of collections into  'collection units' across a multiple dimensions  2. Changes to collection breakdowns and relationships  over time  3. Associating metrics to collections so that they are  extensible, and can be aggregated at any level of the  dynamic collection hierarchy  4. Linking dimensions to external controlled vocabularies,  ontologies and hierarchies  5. Linking collection breakdowns to relevant entities  institutions, people etc  6. Dynamically grouping collection units for contextual  tagging and reporting  7. Linking collection units to item-level digital records in  external data stores			4	Matt Woodburn, ?	Janeen Jones, Sharon Grant*, Kate Webbink, Matt Woodburn, Holly Little, Wouter Addink, Ramona Walls, Dave Smith, William Ulate		
3.2		Extend use cases		Evaluate and extend reuse use case analysis done by the CDD ICEDIG work package task group. Add our use cases to this form. Check fit of our use cases to these defined user groups.			4	?	Deborah Paul, Niels Raes		
3.3		Reconcile use cases against data model	3.1, 3.2	Reconcile use cases against first draft high-level model			2	?	Ramona Walls, William Ulate	https://github.com/tdwg/ncd/wiki/Use-Cases	
4	Data standards			Develop DwC extension and thesaurus for natural science collections (a specific collection object type)			8				
4.1		Identify existing terms	3	Identify existing terms within DwC and external standards ontologies that map to CD data model entities and properties			2	?	Kate Webbink, Sharon Grant*, Janeen Jones, Matt Woodburn, Dag Endresen, Wouter Addink, William Ulate	https://docs.google. com/spreadsheets/d/1SDbtZxEzg0t10OSNDPJN0XSye6m MOTTCIBH3xh-HUYA/edit#gid=0	
4.2		Define missing terms	3, 4.1	Define missing terms and entities to add to DwC standard			4	?	William Ulate		
4.3		Identify existing vocabularies	1.3, 1.4	Identify existing controlled vocabularies, hierarchies and ontologies for relevant collections breakdown dimensions			4	?	Dag Endresen, Ramona Walls, Kerstin Lehnert, Matt Woodburn, William Ulate	Work with the TDWG Vocab Group: https://www.tdwg.org/community/bdq/tg-4/	
4.4		Persistent identifiers on collection units	3	Design method for assigning and managing persistent identifiers on collection units			2	?	Dag Endresen, Wouter Addink, Ramona Walls, Kerstin Lehnert	DOI (DataCite DOI) for collections (?), ISNI, http://www.isni.org/ (ISNI is superset of ORCID), VIAF, https://viaf.org/, Org ID, https://www.arin.net/resources/request/org.html (?), http://www.igsn.org	
5	Documentation			Compile and share guidance documentation	Guidance document including recommendations on citation		2				

5.1		Draft data management guidelines	3, 4	Draft CD data management guidelines. How do people create and manage data within the scope of this standard? e.g., 1) manually describe and post data (for harvesting, as is currently done with DwCArchives); 2) submit through web interface directly to registry (as with GRBio); 3) atomatically create summary from collection management system and submit/post. Also describe how on-going maintenance might proceed, from gross description to finer-grained descriptions. Can also be called a "Concept of Operations", i.e., a narrative describing categories of users/actors and how the data are created, updated, aggregated, searched, etc.	2	?	Stan Blum, Matt Woodburn, Donald Hobern, Kerstin Lehnert		
5.2		Citation guidance	3,4	Provide recommendations on citing collections	1	?	?	someone with RDA connections? Anne Thessen?	
6	6 Reference examples			Assemble example implementations (e.g. in RDF), using data provided by relevant members of the group	4				
6.1		Implement reference examples	3, 4, 5	These examples would include 1) whole high-level collection descriptions, 2) more nuanced, detailed, atomized and normalized examples, and 3) automated examples	4	?	Dag Endresen, other group members like FM, iDigBio (Collections Catalogue - can get some volunteers), NHM, DiSSCo (Maybe ALA?)		
7	7 Develop extensions			Look for requirements to expand beyond the original scope of natural sciences.	1				
7.1		Propose extensions and new task groups		Other task groups would take on adding other collection types, if desired. Means the high level data model is well-developed and extensible, and it is clear on how to extend it.	1	?	Deborah Paul, Mike Trizna		

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4.3		Identify existing vocabularies	1.3, 1.4	4																								
4.4		Persistent identifiers on collection units	3	2																								
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6	Reference examples			4	Ī																							
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	Develop extensions			1																								
7.1		Propose extensions and new		1	1	4	4	4	4	4	4	4	4	4		-	-	-	-	-	-							#
7.1		task groups		1																								

		Time												
row	orderin	Needed for Task	Task	Milestones	Description of work	Output	People	Deadline	See also					
1			Analyze Landscape and requirements		See if existing collections descriptions exist that we might use / adapt	Landscape and requirements analysis	Connie Rinaldo, Terry Catapano							
2		1		Crosswalks ready	Crosswalk of existing collections descriptions methodologies		Mareike Petersen, Niels Raes, others?		https://github.com/tdwg/ncd/wiki/Crosswalks					
							Mareike Petersen, Mike		https://docs.google. com/spreadsheets/d/1qX18gn1puRXVAsmZHOE					
3		1		Use cases collected	Crosswalk of existing and previous collections descriptions standards		Trizna, Niels Raes, others? Matt Woodburn, Mareike		Epnp95GdPUyZMaBpRpgU_e8/edit#gid=0 https://docs.google.					
4		1			Identify relevant dimensions for collections breakdowns (geographic, taxonomic, temporal etc)		Petersen, Mike Trizna, Nie Raes	ls	com/spreadsheets/d/1qX18gn1puRXVAsmZHOE_ Epnp95GdPUyZMaBpRpgU_e8/edit#gid=0					
5		1	Outline a		Define initial scope of collections types to be supported (specimens, observations, field notes, media, datasets etc)									
6		2 3 weeks	Communication plan		write up how we will do this add this information to the charter	Communication plan	Deborah Paul, input from a	2018-08-22	2					
		2			Develop data model to support these requirements:									
		3 6 months	Develop high level data model	hierarchy of collection classes defined	Recursive, dynamic breakdowns of collections into 'collection units' across a multiple dimensions     Changes to collection breakdowns and relationships over time     A. Associating metrics to collections so that they are extensible, and can be aggregated at any level of the dynamic collection hierarchy     Linking dimensions to external controlled vocabularies, ontologies and hierarchies     S. Linking collection breakdowns to relevant entities - institutions, people etc     6. Dynamically grouping collection units for contextual tagging and reporting     7. Linking collection units to time-level digital records in external data stores	Data model definition decument	Field Museum* (Janeen Jones, Sharon Grant*, Kat Webbink), Matt Woodbur Holly Little, Wouter Addin! Ramona Wall	٦,						
9		3	uata model	delilled	Reconcile use cases against first draft high-level model	Data model definition document	Ramona Walls		https://github.com/tdwg/ncd/wiki/Use-Cases					
10		3			Evaluate and extend reuse use case analysis done by the CDD ICEDIG work package task group. Add our use cases to this form. Check fit of our use cases to these defined user groups. (4 months)		Deborah Paul, Niels Raes,		https://github.com/towg/nco/wiki/ose-Cases					
11			Develop extension/thesaurus for natural science collections (a specific collection object type)		Identify existing terms within DwC and external standards ontologies that map to CD data model entities and properties (relies on 1a,3a)		Kate Webbink, Sharon Grant*, Janeen Jones, Mat Woodburn, Dag Endresen, Wouter Addink		https://docs.google.com/spreadsheets/d/1SDb	ZxEzg0t10OSNDP	JN0XSye6mN	MOTTCIBH3xh-l	HUYA/edit#gid=0	<u>)</u>
12		4			Define missing terms and entities to add to DwC standard									
13		4			Identify existing controlled vocabularies, hierarchies and ontologies for relevant collections breakdown dimensions		Dag Endresen interested to participate (after GBIF GB25), others? Stan? Ramona Walls, Kerstin Lehnert		work with the TDWG Vocab Group https://www.tdwg.org/community/bdq/tg-4/					
14		4	Persistent identifiers on collection units		Design method for assigning and managing persistent identifiers on collection units		Dag Endresen interested to participate (after GBIF GB25), Wouter Addink, Ramona Walls, Kerstin Lehnert		DOI (DataCite DOI) for collections (?), ISNI, http://www.isni.org/ (ISNI is superset of ORCID), VIAF, https://wiaf.org/, Org ID, https://www.arin.net/resources/request/org.html (?), http://www.igsn.org					
15		5 1 month	Compile and Share Guidance documentation		updated, aggregated, searched, etc.	Guidance document including recommendations on citation	Stan, Matt, Donald, Kerstir Lehnert	1						
16		5 1 month			Provide recommendations on citing collections									
17		6 4 months?	Implement examples as reference		Assemble example implementation (RDF?) have our group (relevant members) create examples with their data  These examples would include 1) whole high-level collection descriptions, 2) more nuanced, detailed, atomized and normalized examples, and 3) automated examples	Reference Implementation(s)	Dag Endresen (interested t participate, after GBIF GB25) other group membe like FM, iDigBio (Collection Catalogue - can get some volunteers), NHM, DISSCo (Maybe ALA?)	ers es						
18		7 1 month	Develop Extensions (new task groups)		Original scope is natural sciences. Other task groups would take on adding other collection types, if desired. Means the high level data model is well-developed and extensible, and it is clear on how to extend it.		Deborah Paul, Mike Trizna							

ordering Time Needed for Task	Task	Milestones	Description of work	Output	People	Deadline	See also							
1a	Analyze Landscape and requirements	Crosswalks ready	Crosswalk of existing collections descriptions methodologies	Landscape and requirements analysis	Mareike Petersen, others?									
1b		Use cases collected	Crosswalk of existing and previous collections descriptions standards		Mareike Petersen, others?									
1c			Identify relevant dimensions for collections breakdowns (geographic, taxonomic, temporal etc)		Matt Woodburn, Mareike Petersen									
1d			Define initial scope of collections types to be supported (specimens, observations, field notes, media etc)											
2a	Outline a Communication plan		write up how we will do this	Communication plan										
2b			add this information to the charter											
3a	Develop core data model		Develop data model to support:	Data model definition document	Janeen Jones, Sharon Grant Kate Webbink, Matt Woodburn, Holly Little	,								
3b			1. Recursive, dynamic breakdowns of collections into 'collection units' across a multiple dimensions											
3c			2. Changes to collection breakdowns and relationships over time											
3d			Associating metrics to collections so that they are extensible, and can be aggregated at any level of the dynamic collection hierarchy											
3e			Linking dimensions to external controlled vocabularies, ontologies and hierarchies											
3f			5. Linking collection breakdowns to relevant entities - institutions, people etc											
3g			6. Dynamically grouping collection units for contextual tagging and reporting											
3h			7. Linking collection units to item-level digital records in external data stores											
4a	Develop extension/thesaurus for natural science collections (a specific collection object type)	1	Identify existing terms within DwC and external standards ontologies that map to CD data model entities and properties		Kate Webbink, Sharon Grant, Janeen Jones		https://docs.	google.com/spre	adsheets/d/1SD	btZxEzg0t10OS	NDPJN0XSye6m	MOTTCIBH3xh	-HUYA/edit#gid=	o
4b			Define missing terms and entities to add to DwC standard											
4c			Identify existing controlled vocabularies, hierarchies and ontologies for relevant collections breakdown dimensions											
4d			Design method for assigning and managing persistent identifiers on collection units											
Sa	Compile and redact a Guidance documentation		Draft CD data management guidelines. How do people create and manage data within the scope of this standard? e.g., 1) manually describe and post data (for harvesting, as is currently done with DwCArchives), 2) submit through web interface directly to registry (as with GRBio); 3) automatically create summary from collection management system and submit/post. Also describe how on-going maintenance might proceed, from gross description to finergrained descriptions. Can also be called a "Concept of Operations", i.e., a narrative describing categories of users/actors and how the data are created, updated, agregated, searched, etc.		Stan, Matt									
5b			Provide recommendations on citing collections		, mate									
6	Implement examples as reference		Assemble example implementation (RDF?) Assemble group (relevant members) create examples with their data	Reference Implementation(s)										
7	Develop Extensions (new task groups)		Original scope is natural sciences. Other task groups would take on adding other collection types, if desired	,										