

CDDA version 16 (2018)

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1 Introduction & Background

This document describes the activities, discussions and procedures surrounding the process of the new CDDA version production. Due to the changes in the CDDA workflow and CDDA model, a large number of issues and discussions have arisen during the work, which are also presented in this document.

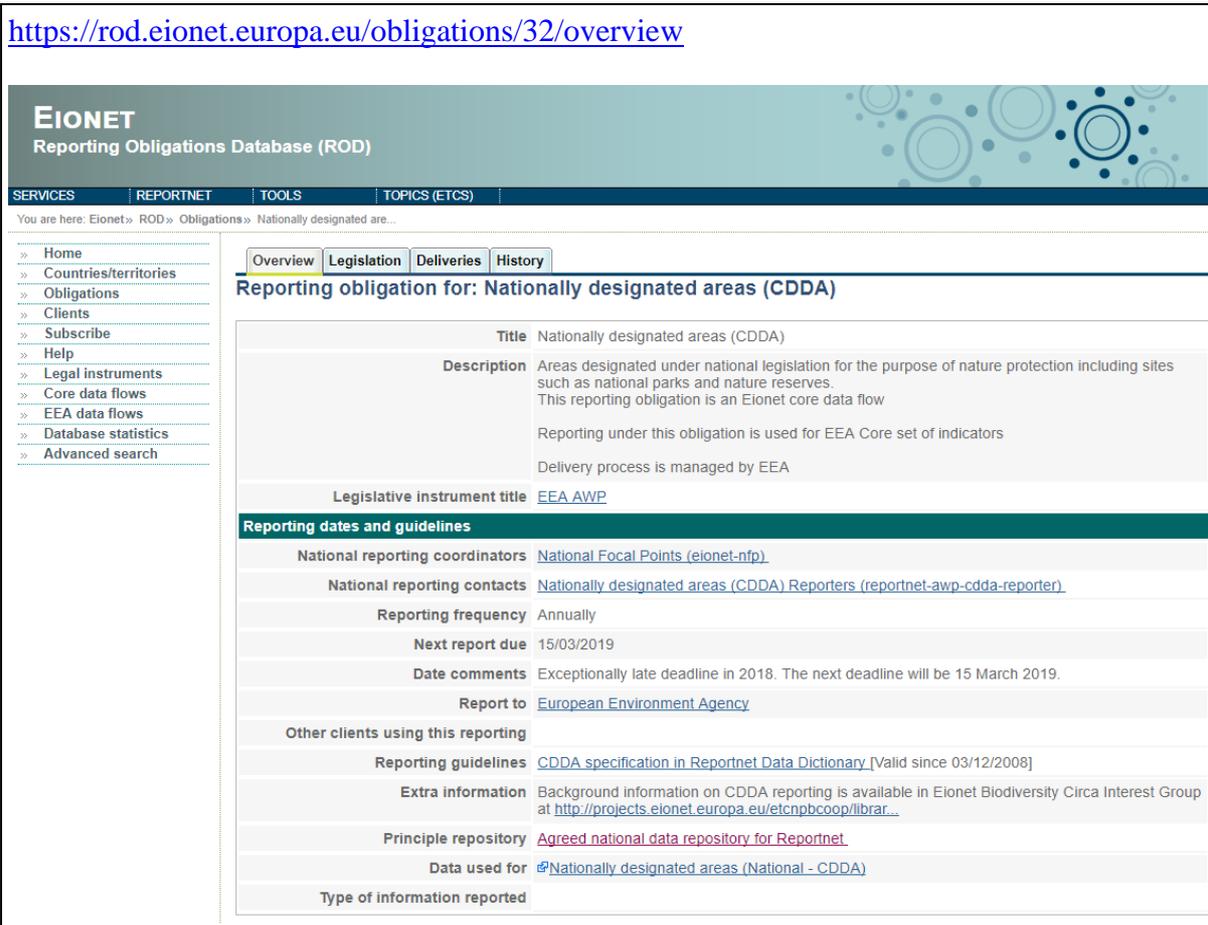
1.1 The Nationally designated areas inventory (CDDA)

The Nationally designated areas inventory (CDDA) is an [Eionet core data flow](#) and holds information about protected areas and the national legislative instruments, which directly or indirectly create protected areas. The dataset contains data on nationally designated sites and designated boundaries in EEA member and cooperating countries. The CDDA data is delivered by each country as tabular dataset and as spatial dataset.

The CDDA is maintained by the European Environment Agency (EEA) with support from the European Topic Centre on Biological Diversity (ETC/BD). The dataset is used by the EEA for its main assessments, products and services.

In addition, the CDDA is the official source of protected area information from European countries to the World Database of Protected Areas (WDPA) <https://www.protectedplanet.net>.

<https://rod.eionet.europa.eu/obligations/32/overview>



EIONET
Reporting Obligations Database (ROD)

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Overview | Legislation | Deliveries | History

Reporting obligation for: Nationally designated areas (CDDA)

Title	Nationally designated areas (CDDA)
Description	Areas designated under national legislation for the purpose of nature protection including sites such as national parks and nature reserves. This reporting obligation is an Eionet core data flow Reporting under this obligation is used for EEA Core set of indicators Delivery process is managed by EEA
Legislative instrument title	EEA AWP
Reporting dates and guidelines	
National reporting coordinators	National Focal Points (eionet-nfp)
National reporting contacts	Nationally designated areas (CDDA) Reporters (reportnet-awp-cdda-reporter)
Reporting frequency	Annually
Next report due	15/03/2019
Date comments	Exceptionally late deadline in 2018. The next deadline will be 15 March 2019.
Report to	European Environment Agency
Other clients using this reporting	
Reporting guidelines	CDDA specification in Reportnet Data Dictionary [Valid since 03/12/2008]
Extra information	Background information on CDDA reporting is available in Eionet Biodiversity Circa Interest Group at http://projects.eionet.europa.eu/etcnpbcoop/librar...
Principle repository	Agreed national data repository for Reportnet
Data used for	@Nationally designated areas (National - CDDA)
Type of information reported	

1.2 Definition of terms

Before going into further detail on the QA/QC process of the CDDA database, please consider the following definitions of important terms and key activities of the process. These reflect the terminology used within the present report.

Table 1-1 Definition of terms

<p>Validation / Quality control (QC)</p>	<p>Validation is the process by which the accuracy and consistency of products are evaluated and the associated uncertainties are quantified (Justice et al., 2000).</p> <p>Product <i>accuracy</i> is assessed by a comparison with independent data sources such as ground-based measurements, more detailed data or well-calibrated models.</p> <p>Inter-comparison with other equivalent products is also part of the validation process allowing building up a community reference product when no or not enough independent data are available.</p> <p>Quality control, or QC for short, is normally carried out after the end of the production and aims at providing the user with measurable / quantitative information how well the product meets the pre-defined specifications.</p>
<p>Verification / Quality assurance (QA)</p>	<p>The act of reviewing, inspecting, testing, checking, auditing, or otherwise establishing and documenting whether items, processes, services, or documents conform to specified requirements.</p> <p>Verification is a qualitative process in which intermediate or final results of the production process are commented and potential deviations from the specifications are highlighted. The verification will be performed during the course of production and is meant to increase data and production quality.</p> <p>Quality Assurance (QA) is a way of preventing mistakes or defects in products and avoiding problems when delivering solutions or services to customers.</p> <p>QA is applied to physical products in pre-production to verify what will be made meets specifications and requirements, and during manufacturing production by validating whether lot samples meet specified quality controls.</p> <p>QA is also applied to software to verify that features and functionality meet business objectives, and that</p>

	code is relatively bug free prior to shipping or releasing new software products and versions.
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The QC process described in the current report is a verification process, as the output does not provide quantitative results about the database quality and is used as an element of a process to correct and improve the latest integrated European database version.

2 The new 2018 CDDA model

From the old CDDA version to the new version v16 (2018) the CDDA model was improved following INSPIRE specifications. The detailed CDDA data model description can be found in the CDDA guidelines:

<http://cdr.eionet.europa.eu/help/cdda/CDDAv16%202018%20guidelines%20v1.1.pdf>

The new CDDA reporting for 2018 can be divided into two different types of delivery:

- Type 1 – which comes from and are defined by the INSPIRE Protected Sites
- Type 2 – which comes from the revised CDDA tabular data

Type 1 includes the spatial data and overlaps with certain CDDA reporting elements.

Type 2 includes the remaining tabular CDDA reporting elements. The Type 2 part delivery is a table with considerable similarity to the current CDDA database specifications. Field names and code lists are however all revised and new. Both Type 1 and Type 2 data files hold mandatory CDDA information.

The two parts of the CDDA reporting (Type 1 and Type 2) are linked by use of a common identifier at data set level as well as on object level:

Figure 2-1 The two parts of the CDDA reporting

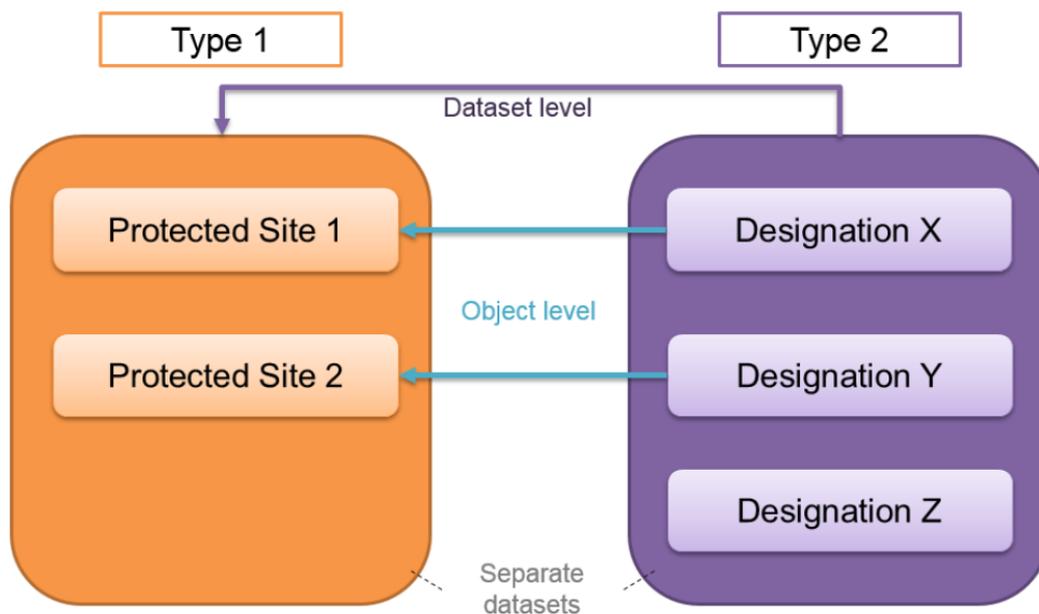
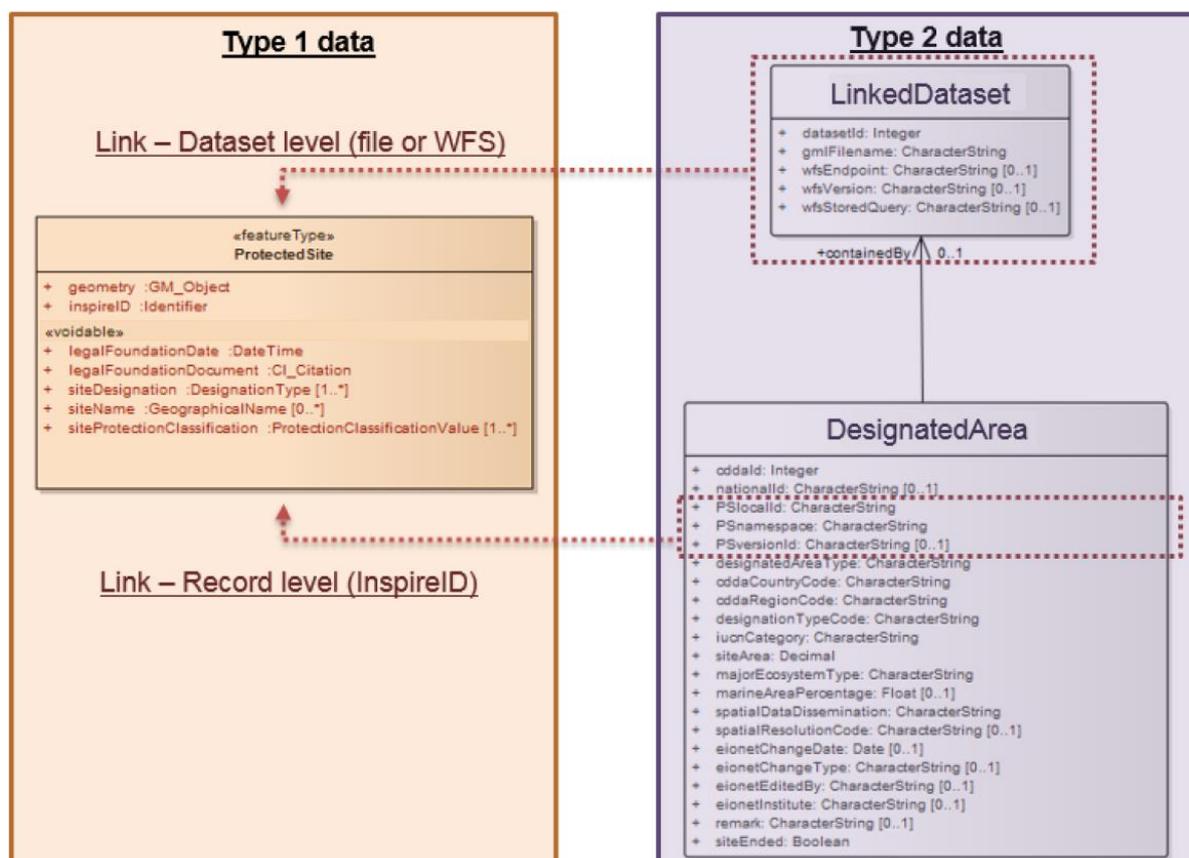


Figure 2-2 CDDA model in UML INSPIRE Protected Sites (left) and the DesignatedArea and the LinkedDataset tables (right)



2.1 Tabular data (type 2 data)

The type 2 represent the tabular CDDA information. The type 2 dataset is built up by two tables:

- DesignatedArea
- LinkedDataset

The **Designated Area** table is the main CDDA table which is primarily constructed from the pre-2018 CDDA Sites table. The elements are not part of the INSPIRE Protected Sites data model with one exception: `iucnCategory`. The IUCN category is included in the `siteDesignation` data type of the INSPIRE Protected Sites.

The **Linked Dataset** table acts as a bridging element between the records of the Designated Area table and the records of an external GML file or the INSPIRE Protected Site records which contain the relevant spatial information.

All information about the different elements can be found in the Data Dictionary (<http://dd.eionet.europa.eu/datasets/3344>).

The following figures shows an example of the different tables and elements of type 2:

Figure 2-3 Example of CDDA type 2 data (including an example of a designated area in Luxembourg)

Element	Example
datasetId	11111
gmlFileName	CDDA_type2_v15_LU_20180310.gml
wfsEndpoint	http://geoserver.institution.eu/geoserver/wfs?
wfsVersion	2.0.1
wfsStoredQuery	http://inspire.ec.europa.eu/operation/download/getspatialdataset

Element	Example
cddaid	337498
nationalId	LU0001029
PSlocalId	337498
PSnamespace	EIONET.ENVIRONMENT.PS.CDDA.LUX
PSversionId	1
designatedAreaType	designatedSite
cddaCountryCode	LU
cddaRegionCode	LU
designationTypeCode	LU06
iucnCategory	IV
siteArea	1675.31000
majorEcosystemType	terrestrial
marineAreaPercentage	
spatialDataDissemination	public
spatialResolutionCode	scaleLarger100K
eionetChangeDate	2017-09-26
eionetChangeType	U
eionetEditedBy	PG
eionetInstitute	MDDI
remark	Updated siteArea
siteEnded	false
containedBy	11111

EEA had provided the different national institutes with Excel CDDA template files and technical specifications via country folders on Eionet projects (<https://projects.eionet.europa.eu/cdda-restricted-distribution/>) with access for CDDA reporters, NRC biodivdata and NFPs.

Based on the prefilled template and specification, countries have updated the tables with national CDDA information. After the national update, the database (in Excel or xml format) was uploaded to the CDR.

Further information about the Type 2 dataset are available in the Data Dictionary (<http://dd.eionet.europa.eu/datasets/3344>) or the CDDA guidelines on the CDDA reference page (<http://cdr.eionet.europa.eu/help/cdda>).

2.2 Spatial boundary data (type 1 data)

All geometric information are stored in the CDDA Type 1 dataset. The specifications of the Type 1 data are based on the official INSPIRE Protected Sites specifications which are available here: <http://inspire.ec.europa.eu/id/document/tg/ps>

For the CDDA delivery the following subset of INSPIRE PS attributes are required:

- Geometry
- inspireID
- legalFoundationDate
- siteName

Shapefile and GML file templates were available prefilled with the CDDA data reported in 2017 via country folders on Eionet projects (<https://projects.eionet.europa.eu/cdda-restricted-distribution/>) which countries could use for updating the CDDA type 1 dataset.

Countries which have already implemented INSPIRE have uploaded the CDDA Type 1 data directly in gml-format. For countries which area working with the shp-format a transformation tool was provided which transformed the spatial CDDA data from shape to gml format: http://cdr.eionet.europa.eu/help/cdda/FME_processes/Shp2GML.html

Figure 2-4 Shp2GML – conservation tool to transform CDDA data from shape into gml

Shp2GML: Conversion tool from Shape to GML

The following tool should be used to convert shape files to a GML delivery that can be uploaded to the CDR envelope. Note that the Shape file must be prepared according to a valid **CDDA** template. Refer to the CDDA reporting guidelines for further information.

Note:

EEA Reportnet works best with Google Chrome (recommended) or Mozilla Firefox. **The use of Internet Explorer is not recommended.**

Instructions:

- Click the "Choose File" (or "Browse...") button to select the ZIP file containing the shape files that you want to convert.
- Click the "Upload File" button to upload the file (please be patient, some files may take a while to upload).
- Click the "Refresh File List" button to see the list of files (please be patient, some files may take a while to upload).
- Provide a valid e-mail address and click the "Execute" button.
- When the conversion is ready, the system will send you an e-mail, with the link to the converted file.
- You can then download the file and add the GML file to your data delivery envelope in CDR.

Zipped Shape files: Keine ausgewählt

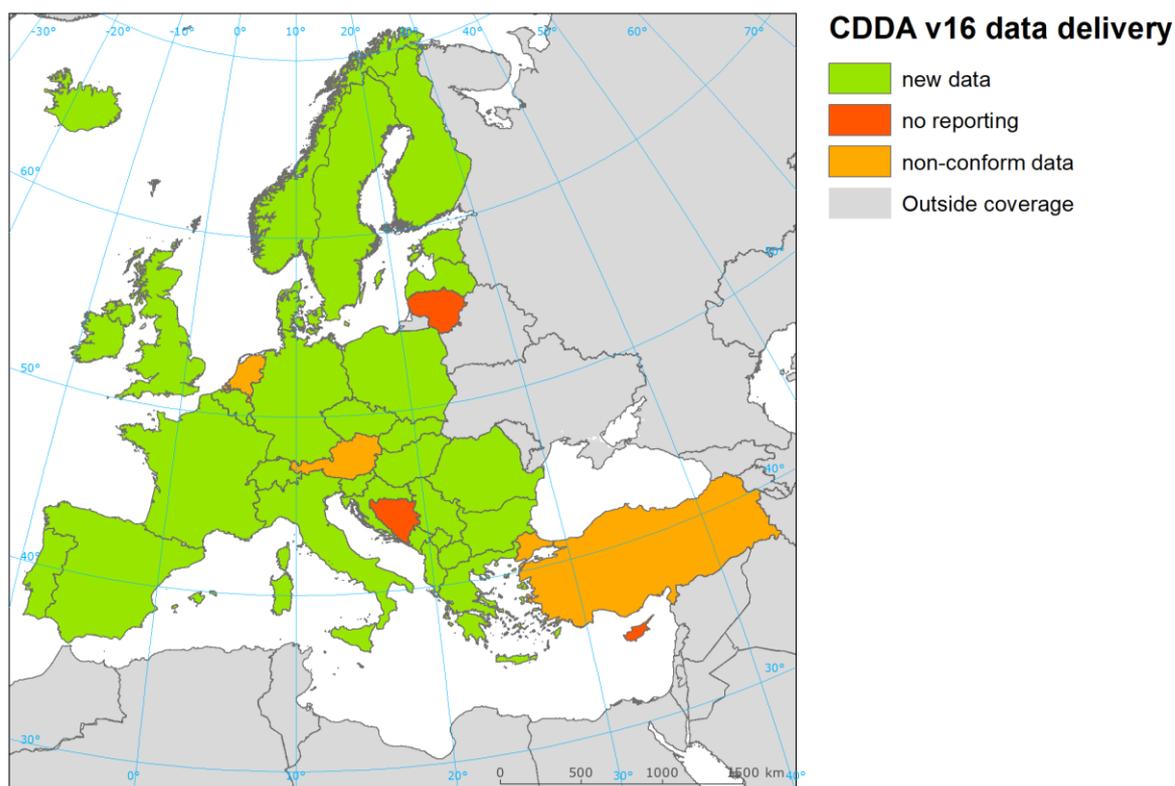
File list:

Additional specifications about the CDDA delivery can be found here: <http://cdr.eionet.europa.eu/help/cdda>

3 The national CDDA v16 country deliveries

Every year, the member countries provide the newest status of protected sites to EEA. The entire CDDA dataset covers 39 countries as well as Greenland (Denmark) and the French Overseas Departments and Territories and Overseas Collectives. The following chapter gives a short overview of the single country delivery. Further information about individual CDDA deliveries can be found in the new CDDA-QA country documents.

Map 3-1 Countries CDDA data delivery in 2018



A detailed overview is given in the following table. The cells highlighted in yellow show countries that have not provided data for various reasons (e.g. no new national CDDA sites).

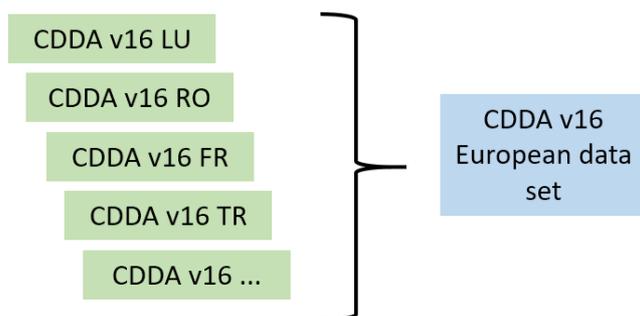
Table 3-2 Data deliveries and data updates for CDDA version 15 & 16, respectively (tabular ↔ type 2 & spatial ↔ type 1)

Country	ISO2	Version 15 (2017)	Version 16 (2018)
Albania	AL	new data	new data
Austria	AT	new data	non-conform data
Bosnia and Herzegovina	BA	no reporting	no reporting
Belgium	BE	new data	new data
Bulgaria	BG	new data	new data
Switzerland	CH	new data	new data
Cyprus	CY	new data	no reporting
Czech Republic	CZ	new data	new data
Germany	DE	new data	new data
Denmark	DK	new data	new data
Estonia	EE	new data	new data
Spain	ES	new data	new data
Finland	FI	new data	new data
France	FR	new data	new data
United Kingdom	GB	new data	new data
Greece	GR	new data	new data
Croatia	HR	new data	new data
Hungary	HU	new data	new data
Ireland	IE	new data	new data
Iceland	IS	new data	new data
Italy	IT	new data	new data
Liechtenstein	LI	no reporting	no reporting
Lithuania	LT	new data	no reporting
Luxembourg	LU	new data	new data
Latvia	LV	new data	new data
Montenegro	ME	new data	new data
The former Yugoslav Republic of Macedonia	MK	new data	new data
Malta	MT	new data	new data
Netherlands	NL	new data	non-conform data
Norway	NO	new data	new data
Poland	PL	new data	new data
Portugal	PT	new data	new data
Romania	RO	no reporting	new data
Serbia	RS	new data	new data
Sweden	SE	new data	new data
Slovenia	SI	new data	new data
Slovakia	SK	new data	new data
Turkey	TR	new data	non-conform data
Kosovo	XK	new data	new data

4 European CDDA dataset production

The final CDDA v16 data set is the union of all individual national type 1 and type 2 data sets. After successful QC, all single dataset will be combined to one European CDDA dataset. If countries did not deliver any data in CDDA 2018 data collection, or the delivery was not technically accepted, data from their most recent delivery, as transformed by EEA to new structure, will be used to complete the European data set.

Figure 4-1 European CDDA dataset



The new data set will be published on the Nationally designated areas EEA website in GeoPackage, csv and shapefile formats:

<https://www.eea.europa.eu/data-and-maps/data/nationally-designated-areas-national-cdda-13>

Figure 4-2 Nationally designated areas (CDDA) website

European Environment Agency

Topics Countries Data and maps Indicators Publications

Data and maps Datasets Nationally designated areas ...

Nationally designated areas (CDDA)

Data — Prod-ID: DAT-24-en — Created 23 Aug 2017 — Published 18 Sep 2017 — Last modified 30 Oct 2017 — 9 min read

Topics: Biodiversity — Ecosystems — Land use

The European inventory of nationally designated areas holds information about protected areas and the national legislative instruments, which directly or indirectly create protected areas.

European data GIS data Additional information Metadata

CDDA (5 tables)

The dataset contains data on individual nationally designated sites and designations in EEA member and collaborating countries.

[+] Show table definition

- CDDA (Microsoft Access database file) (ZIP archive)
5.39 MB Download file
- CDDA (CSV files) (ZIP archive)
5.09 MB Download file

5 Verification

The spatial and tabular data was checked by **EEA** and **ETC/BD** at two points during the CDDA v16 production workflow:

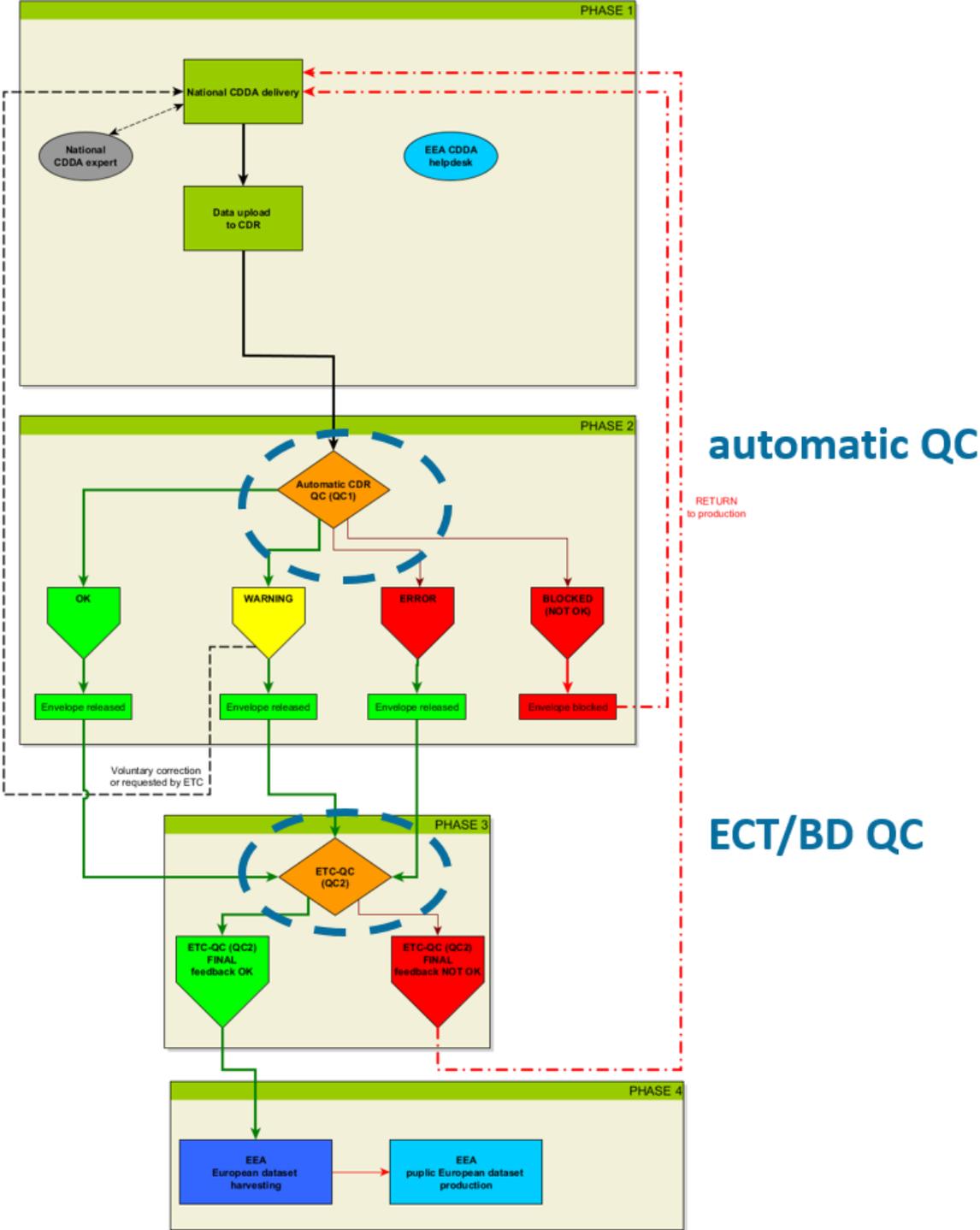
- Automatic QC
- ETC/BD_QC

Automatic quality assurance takes place after uploading the data to CDR. When the automatic QC is completed, a QC report is published on CDR. If the report does not contain any blockers (i.e. QC checks that indicate missing or wrong elements), the next step can be started – the ETC-QA.

Figure 5-1 shows a simplified representation of CDDA production. The workflow is divided into four phases:

- phase 1 - national CDDA production and upload to CDR
- phase 2 - automatic QC
- phase 3 – ETC/BD - QC
- phase 4 - European CDDA dataset production

Figure 5-1 CDDA workflow (the two quality steps are marked with a blue dotted circle)



5.1 *The automatic QC*

After uploading the data and releasing the envelope, automatic QC starts.

The following single checks were carried out during the check:

- TEST 1 on Type 2 data inventory (Designated Area (a) and Linked Dataset (b))
 - 1a./ 1b. Mandatory values test
 - 2a./2b. Record uniqueness test
 - 3a./3b. Data types test
 - 4a. Valid codes test
- TEST 2 on Type 1 data inventory
 - 1. Inventory test – ProtectedSite
 - 2. Inventory test – DesignatedArea
 - 3. InventoryTest – LinkedDataset
- TEST 3 relation test between type 1 and type 2 data
 - 1.a/b. Presence test - gml file
 - 2.a/b. Relational test - DesignatedArea link to ProtectedSite
 - 2.c Relational test - DesignatedArea link to ProtectedSite through LinkedDataset
 - 3. Geometry coherence test
 - 4. Relational test - ProtectedSite link to ended DesignatedArea
- TEST 4 Type 1 data QC
 - 1. Mandatory values test - ProtectedSite
 - 2. Uniqueness test - ProtectedSite
 - 3. Coordinate reference system test
 - 4. Geometry validity test
 - 5. Positional check
 - 6. Format test - legalFoundationDate
 - 7. Range test – legalFoundationDate
- TEST 5 Type 2 data QC
 - 1.a Conditional mandatory value test - containedBy
 - 2.a Uniqueness test - DesignatedArea records - cddaId
 - 2.b Uniqueness test - DesignatedArea records - PSlocald, PSnamespace
 - 3. Reference test - cddaId
 - 4. Missing data test - cddaId
 - 5. Reference test - cddaCountryCode and cddaRegionCode
 - 6. Reference test - designationTypeCode
 - 7. Logical coherence test - designationTypeCode, cddaCountryCode and cddaRegionCode
 - 8. Logical coherence test - majorEcosystemType and marineAreaPercentage
 - 9.a Relational test - DesignatedArea link to LinkedDataset
 - 9.b Relational test - LinkedDataset link to DesignatedArea

After the tests an automatic feedback on EIONET with the QC results is published.

Figure 5-2 QC feedback on CDR (overview of the QC feedback links)

[AutomaticQA result for file CDDA_2018_CH_type2data_20180301_LG_2.xml: CDDA XQuery](#) (Posted automatically on 29 Mar 2018)
[AutomaticQA result for: CDDA FME QC Inventory](#) (Posted automatically on 29 Mar 2018)
[AutomaticQA result for: CDDA FME QC Relations](#) (Posted automatically on 29 Mar 2018)
[AutomaticQA result for: CDDA FME QC Type1](#) (Posted automatically on 29 Mar 2018)
[AutomaticQA result for: CDDA FME QC Type2](#) (Posted automatically on 29 Mar 2018)

Four different types of feedback are returned:

- **OK** – the QC check was successful – no error was found
- **WARNING** – some information for future deliveries or questionable data content
- **ERROR** – major issues found which are not blocking the release of the envelope
- **[BLOCKER]** – major issues were found which blocking the release of the envelope

The following figure shows an example of the “OK” type feedback:

Figure 5-3 QA feedback on CDR (type 2)

Common Database on Designated Areas (CDDA)

- **Designated area** **OK**
 - [1a. Mandatory values test](#) **OK**
 - [2a. Record uniqueness test](#) **OK**
 - [3a. Data types test](#) **OK**
 - [4a. Valid codes test](#) **OK**
- **Linked dataset** **OK**
 - [1b. Mandatory values test](#) **OK**
 - [2b. Record uniqueness test](#) **OK**
 - [3b. Data types test](#) **OK**

If no blocker appears, the directory is passed to the ETC/BD-QA procedure.

5.2 ETC/BD- QA

The ETC/BD-QA is a combination of automatic and manual quality checks. By use of FME scripts as well as manual inspection different technical specifications of the reported data are controlled.

The first part of the manual check by the ETC contains the checking of issues returned and highlighted in the automatic QA. Depending on the issue the causes for these are analysed and the need for a potential correction is evaluated. The results of this recheck of the returned issues (WARNINGS / ERRORS) is communicated to the country for further clarification and potential correction via the CDDA Helpdesk. For specific significant issues identified already in the automatic QC routines, which influence the data quality, a correction is coordinated with the responsible institution in the country to re-upload revised data. For minor issues and issues which result from elements only mandatory starting with 2019, the country is only informed. It is up to the country in such cases to decide if they will deliver revised datasets or leave the reported datasets as they are.

In the second part of the ETC/BD-QA further checks are performed on the delivered data mainly concerning the spatial part (type 1) and detailed assessment of issues returned in the automatic QC. This part consists of comparing the delivered data to the previous reporting, reference information such as country borders or marine territories and further checks for logical consistency (see also **Error! Reference source not found.**).

In detail the following specifications are checked:

1. Examination of check results from automatic QC
2. Logical consistency of the coordinate reference system used
3. Examination of geometry issues returned in the automatic QC
4. Control of protected area positions found to be outside the country territory (comparison to European country border dataset and Marine regions EEZ outlines)
5. Significant differences in site areas defined in type 2 data and the actual area described by the geometries in the type 1 data (buffer of 10% acceptable differences applied)
6. Logical consistency of defined major ecosystems for protected areas
7. Spatial consistency compared to previous reporting identifying partial or systematic shifts in geometries. Check for differences in delineation such as decreased resolution....
8. Check of type 2 content for logical consistency
9. Comparison of sites names between current and previous reporting to identify potential erroneous links or use of siteCode ↔ cddaId relations
10. Rerun of automatic QC

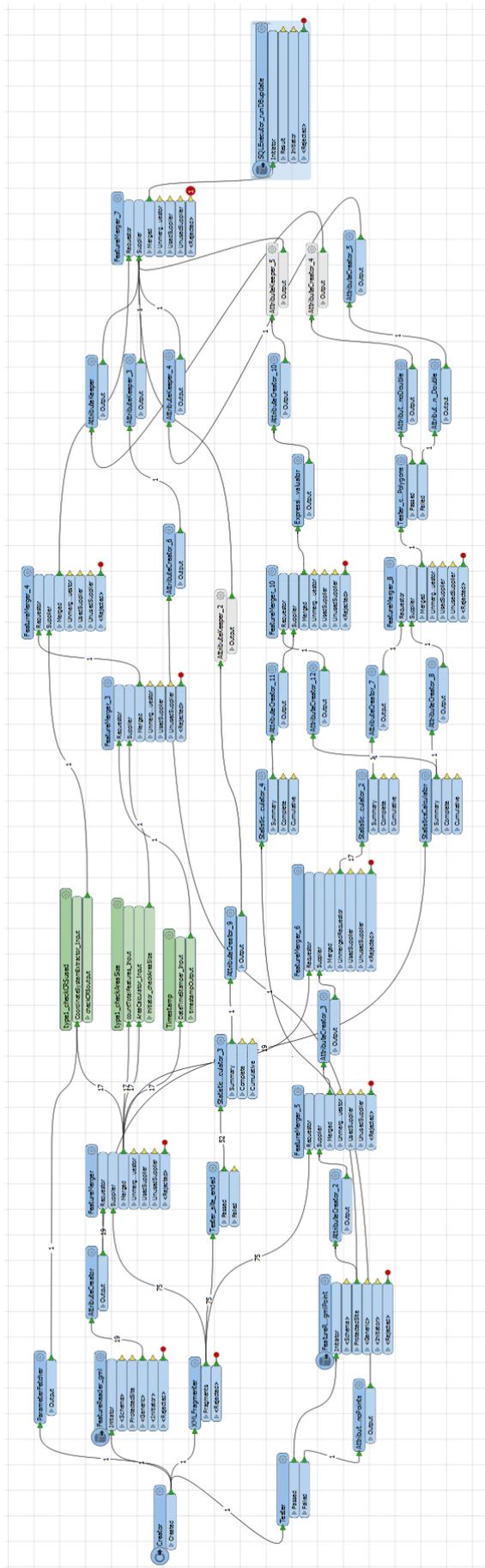


Figure 5-4: FME workflow for partially automatized quality checks in ETC-QC (path in common workspace structure: S:\Common workspace\Bio\CDDA\CDDA_INSPIRE\CDDA_QC_ETC\FME_workflows\final_feedback_checks_v08_v5.fmw)

6 Collected issues during the CDDA reporting

Throughout the CDDA process, various questions and problems arose. The observations and issues identified are communicated to the country via the CDDA Helpdesk. The Helpdesk offers a point of connection to the countries allowing for discussions and questions from both sides. By that the Helpdesk is accounting for a huge part in the whole CDDA reporting procedure. Already in preparation of the CDDA data to be reported, the countries can contact the experts in the EEA/ETC-BD to discuss open questions.

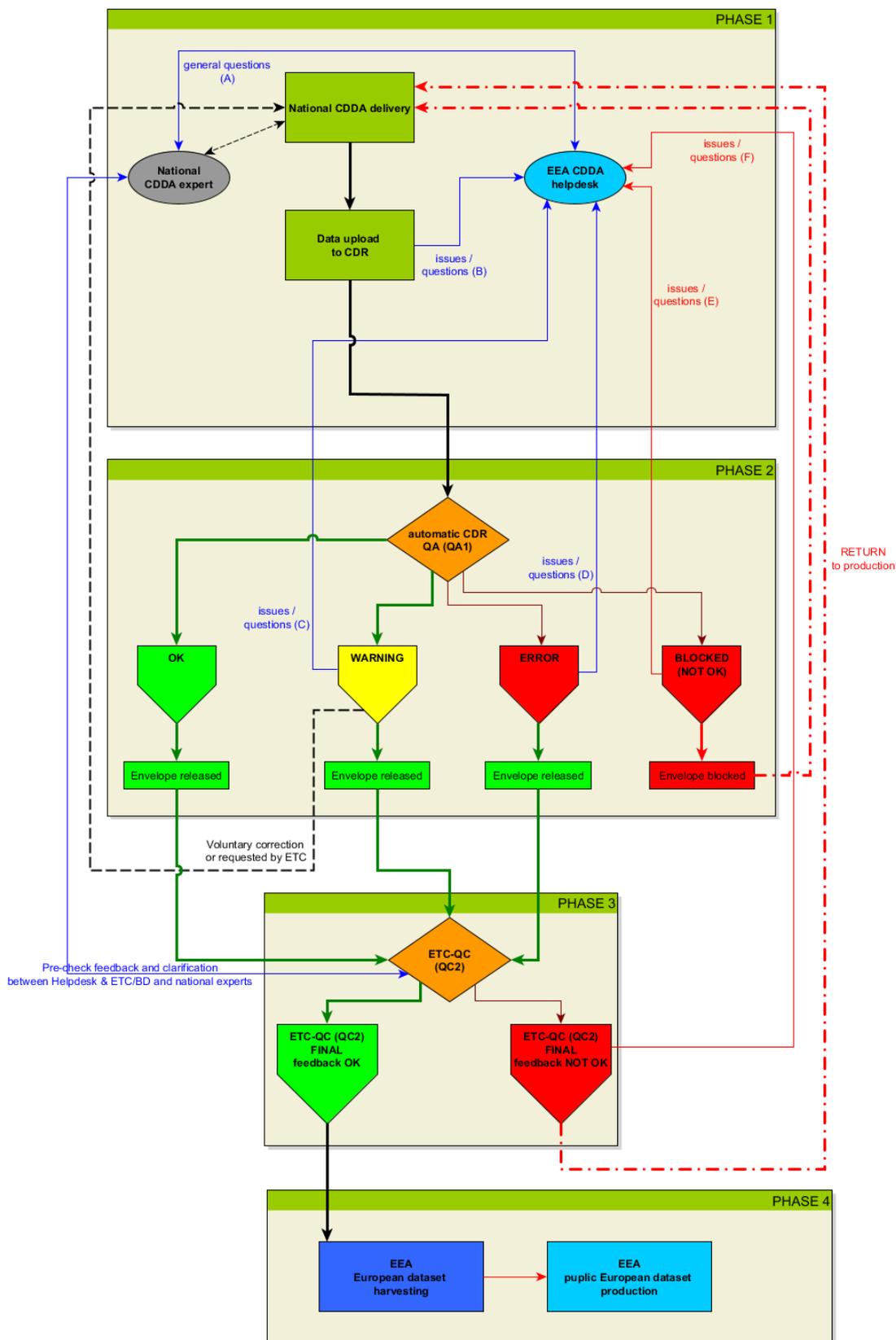
There was a lively discussion between the countries and the EEA/ETC-BD using the EEA helpdesk to solve problems, answering questions and to explain some processing step more in detail.

This chapter collects and lists these questions and problems to develop improvements for the next release in 2019.

The figure below illustrates the different connection-points of discussion between the member countries and EEA/ETC-BD as coloured dashed lines. In order to structure these questions and the problem collection, these were divided into the four phases of the process:

1. Pre-reporting and data preparation phase on country side (PHASE 1)
2. Automated quality checks in the common data repository (CDR) (PHASE 2)
3. Extended quality checks, revision of automatic QC results and reporting evaluation by the ETC/BD (PHASE 3)
4. Production of the compiled European CDDA database by EEA (PHASE 4)

Figure 6-1: CDDA reporting process with consultation of the CDDA Helpdesk (blue line)



6.1 Major issues during the production and upload phase (PHASE 1)

During the preparatory phase of the reporting (countries producing the INSPIRE-conform datasets according to the new data requirements) the following main difficulties and common issues have been detected. As both the preparation and the first evaluation in the automatic QC are strongly connected to each other, some issues appear in combination of the preparation part (PHASE 1) and 1st level QC (PHASE 2).

- a) Difficulties in producing conformant data for those countries not following the standard workflow developed by the EEA (standard meaning: update of provided template shapefile(s) and Excel sheets → upload → automatic conversion into .gml and .xml by conversion service and CDR, respectively)
- b) Reprojection to European CRS failed or introduced errors
- c) Due to the necessity to deliver spatial information for all sites included in the reporting, difficulties in collecting the required spatial boundaries or centre points arose for few countries. In consequence, some countries had to delete sites from the reporting by declaring these as siteEnded although the protection is still valid.
- d) Some countries already use a data harvesting from the national databases. The resulting data extract in some cases were not compliant with the data specifications of the new CDDA reporting (see also 8.2).

6.2 Major issues during the automatic QC1 (PHASE 2)

- a) Misunderstandings in how to handle sites reported only in tabular form in previous reportings (some countries just deleted the sites without flagging as siteEnded = TRUE)
- b) Geometry invalidities such as self-intersections (common error) or non-OGC conformance → minor issues often related to data processing like conversion from GDB → Shapefile → .gml
→ not weighted very high in evaluation of the reporting
- c) Sites found to be located outside country
→ partially actually outside (foreign territory or marine areas not belonging to a specific country) but mostly areas in marine regions assigned to the reporting country not covered by the reference boundaries used in the automatic QA (see remark under **Error! Reference source not found.**)
- d) legalFoundationDate issues:
 - Format of legalFoundationDate in few cases differing from the required format. Especially for countries using their national INSPIRE services the format sometimes differs between the official national INSPIRE service and the one required by the CDDA specifications such as defining fractions of seconds in addition like 2001-08-16T00:00:00.0Z (FI) or 2005-12-07T00:00:00.0000000 (CZ)
 - legalFoundationDate not filled → mandatory starting in 2019
- e) Still some countries in continental Europe use ETRS89 (epsg:4258) as reporting coordinate reference system (CRS) although this projection is stated to be only used for protected areas located outside the European continent (e.g. French DOMs)
- f) Source of CRS definition (opengis.net) initially was not accepted for all countries although using a valid source for the CRS → in the meantime the library of valid CRS sources has been expanded by opengis.net and the CRS used is accepted.
- g) Area values bigger 0 reported for protected areas described by point geometries → polygon geometries not available for all sites or open to public

6.3 Major issues during in the ETC QC phase (QC2) (PHASE 3)

- a) Significant differences between areas reported in type 2 and the actual extent of the geometries in type 1 representing the site (still after applying a 10% buffer for the values)
- b) Naming differences between names defined in the previous CDDA v15 and recent version 16. There are two types of differences:
 - Positive differences (Correction or further detailing of site names especially introduction of correct national spelling using special characters such as ‘é’, ‘å’ or ‘ž’ or providing the official full name instead of abbreviation)
 - Negative differences (erroneous replacement of special characters by other letters, deletion of name parts, allocation of wrong names to sites which were previously correct)
- c) Small scale shifts of parts or full datasets compared to previous reporting requiring correction
- d) Differences in geometries which are not negative but the result of partially very much improved resolution of national inventories on protected areas and corrections/adaptions of already existing sites.
- e) Questionable definition of major ecosystems (e.g. area located fully in marine area with no obvious island or terrestrial appearance defined as ‘terrestrial’)
- f) Thresholds to differentiate fully marine/terrestrial protected areas from mixed marine-terrestrial sites can be still discussed as some countries regard even terrestrial areas with up to e.g. 5% marine fractions still as fully terrestrial. As the assignment of the major ecosystem is carried out by the country the defined ecosystem is correct as long as the reasoning behind can be followed. Nonetheless it’s still not clear to all countries or should be explained further that no value for the marineAreaPercentage field is allowed if the site is defined as purely marine or terrestrial
- g) Cumbersome use of linkedDataset element defining dedicated entries for each protected site described in the designatedArea element making the type 2 very complex without need.

7 Facts and figures from the new CDDA dataset

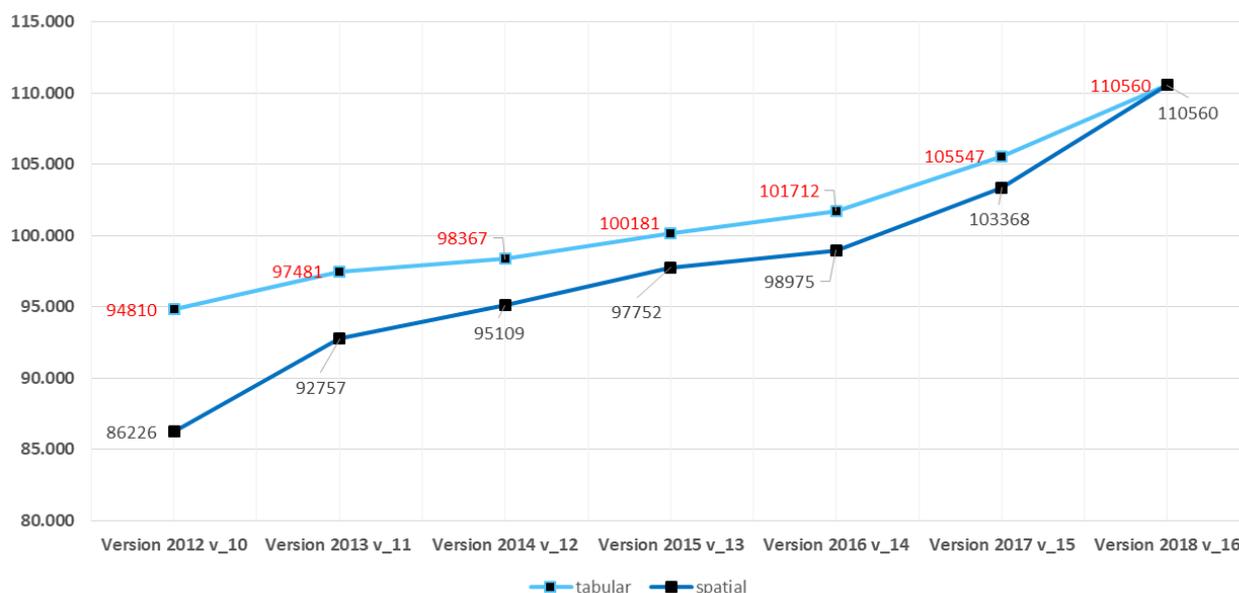
The new CDDA dataset included 110 560 different sites located in 39 countries. Compared to the previous version we had an increase in the number of sites:

Table 7-1 Count of CDDA sites compared to previous version

CDDA version	count of sites	
	tabular	spatial
Version 2018 v_16	110 560	110 560
Version 2017 v_15	105 547	103 368
Version 2016 v_14	101 712	98 975
Version 2015 v_13	100 181	97 752
Version 2014 v_12	98 367	95 109
Version 2013 v_11	97 481	92 757
Version 2012 v_10	94 810	86 226

Because of the new specifications which only allowed sites with spatial information the number of spatial and tabular data is equal.

Figure 7-1 Number of tabular and spatial records in the different CDDA versions



7.1 Overview of the country deliveries

From the 39 countries only four countries delivered no data:

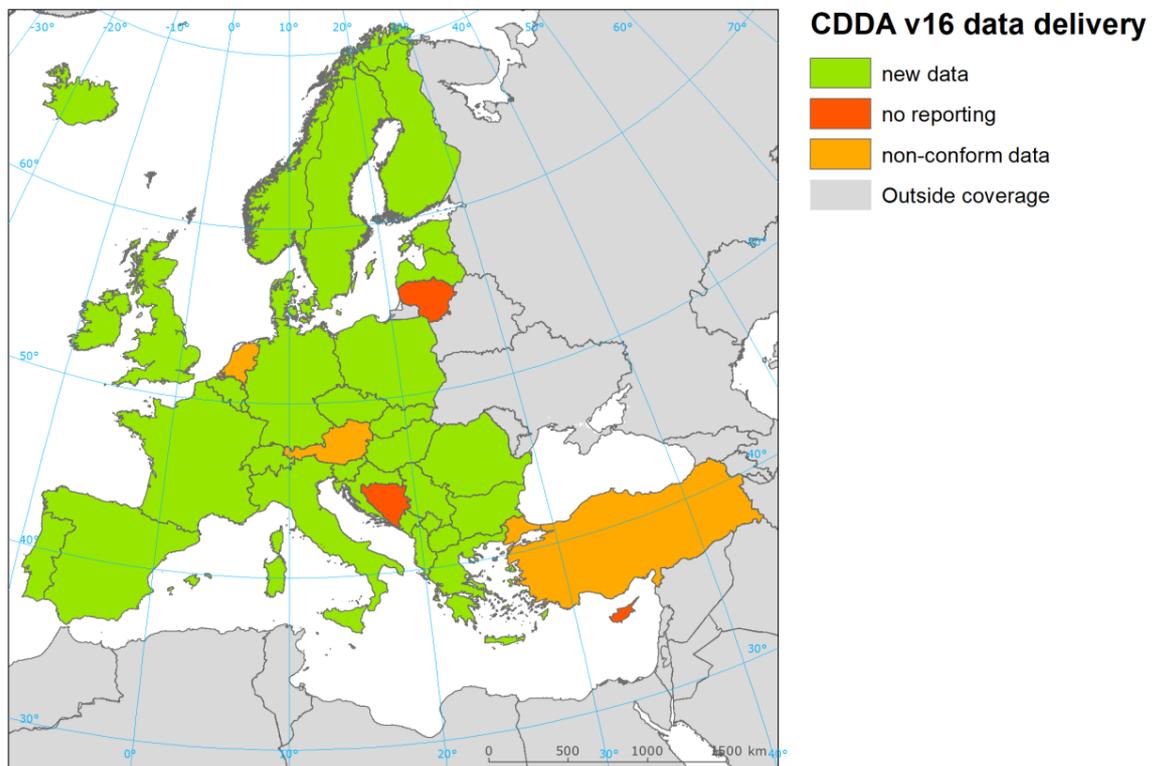
- Bosnia – Herzegovina
- Liechtenstein
- Cyprus
- Lithuania

Three countries did not deliver conform CDDA data:

- Austria (technical projection problems inside some federal states data)
- Netherlands (technical projection problems)
- Turkey (Administrative issues)

More detailed information can be found in the CDDA_v16_QC_report.

Map 7-1 Country delivery overview



The following table shows the changes of number of sites for the different countries between the CDDA delivery from 2017 and the new version from 2018.

Table 7-2 Changes of number of sites between the 2017 and 2018 CDDA delivery

Country		count 2018	count poly 2018	count point 2018	count 2017	Difference 2018-2017	Difference 2017-2016 [%]	INFO
Albania	AL	799	57	742	55	744	1352,73	increase
Austria	AT	1159	1159	0	1159			no new data
Bosnia - Herzegovina	BA	46	33	13				no new data
Belgium	BE	1445	1445	0	1465	-20	-1,37	decrease
Bulgaria	BG	1018	1018	0	1016	2	0,20	increase
Switzerland	CH	6832	6832	0	5891	941	15,97	increase
Czech Republic	CZ	2663	2663	0	2625	38	1,45	increase
Cyprus	CY	59	59	0				no new data
Germany	DE	17646	17646	0	17540	106	0,60	increase
Denmark	DK	1929	1929	0	1929	0	0,00	no changes
Estonia	EE	15653	14708	945	11786	3867	32,81	increase
Spain	ES	1783	1783	0	1779	4	0,22	increase
Finland	FI	13300	13300	0	12692	608	4,79	increase
France	FR	3153	3153	0	3050	103	3,38	increase
Greece	EL	803	803	0	803	0	0,00	no changes
Croatia	HR	408	322	86	407	1	0,25	increase
Hungary	HU	308	308	0	307	1	0,33	increase
Ireland	IE	309	309	0	309	0	0,00	no changes
Iceland	IS	113	112	1	114	-1	-0,88	decrease
Italy	IT	871	871	0	871	0	0,00	no changes
Liechtenstein	LI	41	41	0	41			no new data
Lithuania	LT	479	479	0				no new data
Luxembourg	LU	125	125	0	118	7	5,93	increase
Latvia	LV	677	677	0	709	-32	-4,51	decrease
FYROM	MK	79	75	4	75	4	5,33	increase
Malta	MT	258	258	0	228	30	13,16	increase
Montenegro	ME	52	3	49	4	48	1200,00	increase
Netherlands	NL	180	180	0				no new data
Norway	NO	3033	3033	0	2962	71	2,40	increase
Poland	PL	2046	2046	0	2034	12	0,59	increase
Portugal	PT	229	229	0	225	4	1,78	increase
Romania	RO	944	944	0	943	1	0,11	increase
Serbia	RS	368	368	0	321	47	14,64	increase
Sweden	SE	15296	14130	1166	14849	447	3,01	increase
Slovakia	SK	1191	1191	0	1174	17	1,45	increase
Slovenia	SI	2040	1175	865	2041	-1	-0,05	decrease
Turkey	TR	3656	3655	1				no new data
United Kingdom	UK	9387	9387	0	9387	0	0,00	increase
Kosovo	XK	182	53	129	53	129	243,40	increase
TOTAL EEA39		110560			103368	7192	6,96	increase

In total we have an increase of 7 percent of CDDA sites between 2017 and 2018. Seven countries did not deliver new or conform data. For 4 countries a small decrease, for 4 countries no changes and for 25 countries smaller and larger increases of the count of sites can be recorded. The most significant increase can be observed in Albania from 57 to 742 sites.

Another interesting statistic besides the number is the area of the CDDA sites. For the following statistic the official reported “siteArea” is used.

Table 7-3 Changes of site area between the 2017 and 2018 CDDA delivery

Country		area km ² 2018	area km ² 2017	Difference 2018-2017	Difference 2017-2016 [%]	INFO
Albania	AL	4779	4823	-44	-0,9	decrease
Austria	AT	26324	26324	0	0,0	no new data
Bosnia - Herzegovina	BA	354	354	0	0,0	no new data
Belgium	BE	5996	8409	-2413	-28,7	decrease
Bulgaria	BG	6450	15167	-8717	-57,5	decrease
Switzerland	CH	3679	3489	190	5,4	increase
Czech Republic	CZ	14205	13709	496	3,6	increase
Cyprus	CY	5156	5156	0	0,0	no new data
Germany	DE	133166	140931	-7765	-5,5	decrease
Denmark	DK	996438	996448	-10	0,0	decrease
Estonia	EE	24390	24107	283	1,2	increase
Spain	ES	81105	102572	-21467	-20,9	decrease
Finland	FI	38042	35696	2346	6,6	increase
France	FR	1654269	310950	1343319	432,0	increase
Greece	EL	38103	38103	0	0,0	no changes
Croatia	HR	8123	8120	3	0,0	increase
Hungary	HU	8505	14196	-5691	-40,1	decrease
Ireland	IE	2006	2006	0	0,0	no changes
Iceland	IS	20870	20870	0	0,0	decrease
Italy	IT	60227	60227	0	0,0	no changes
Liechtenstein	LI	82	82	0	0,0	no new data
Lithuania	LT	11504	11504	0	0,0	no new data
Luxembourg	LU	1944	1528	416	27,2	increase
Latvia	LV	16851	16851	0	0,0	decrease
FYROM	MK	2297	2297	0	0,0	no changes
Malta	MT	5023	5022	1	0,0	increase
Montenegro	ME	1667	1795	-128	-7,1	decrease
Netherlands	NL	22013	22013	0	0,0	no new data
Norway	NO	96048	185835	-89787	-48,3	decrease
Poland	PL	104145	103998	147	0,1	increase
Portugal	PT	257471	257456	15	0,0	increase
Romania	RO	14053	20328	-6275	-30,9	decrease
Serbia	RS	6349	5568	781	14,0	increase
Sweden	SE	57313	58676	-1363	-2,3	decrease
Slovakia	SK	12188	12226	-38	-0,3	decrease
Slovenia	SI	34261	28100	6161	21,9	increase
Turkey	TR	60412	60412	0	0,0	no new data
United Kingdom	UK	178568	178568	0	0,0	no changes
Kosovo	XK	1410	1410	0	0,0	no changes
TOTAL EEA39		4015786	2805326	1210460	43,15	increase

In total we have an increase of 43 % (1 210 460 km²) of CDDA sites between 2017 and 2018. Seven countries did not deliver new or conform data. For 14 countries a decrease, for 6 countries no changes and for 12 countries an increase of the site area can be determined. The most significant increase can be observed in France from 310 950 km² to 1 654 269 which contributes significantly to the total increase. To a large extent, the increase takes place in marine areas. The new sites reported by France are located in the overseas territories:

Map 7-2 New reported protected sites “Martinique” and “Mer de Corail”



FR – Martinique 48 425 km²



FR - Mer de Corail 1 294 613 km²

In addition to the strong increase of site area, it is above all the strong loss of land in Norway that stands out: from 185 835 km² to 96 048 km². The following table shows the 10 CDDA sites with the strongest area differences between 2017 and 2018:

Table 7-4 Difference of sites area in Norway (10th largest site area changes)

cddaid	cddaRegionCode	siteArea2018	siteArea2017	majorEcosystemType	siteName	Differences 2018 -2017 km ²
1334	SJ	1866176	5535431	marineAndTerrestrial	Nordaut-Svalbard naturreservat	-36693
1335	SJ	628744	2182591	marineAndTerrestrial	Søraust-Svalbard naturreservat	-15538
821	SJ	367538	987057	marineAndTerrestrial	Nordvest-Spitsbergen nasjonalpark	-6195
393044	SJ	38099	476993	marineAndTerrestrial	Jan Mayen	-4389
3197	SJ	61172	462689	marineAndTerrestrial	Forlandet nasjonalpark	-4015
183218	SJ	4567	318567	marineAndTerrestrial	Hopen naturreservat	-3140
183219	SJ	17668	298171	marineAndTerrestrial	Bjørnøya naturreservat	-2805
183215	SJ	201020	295211	marineAndTerrestrial	Nordre Isfjorden nasjonalpark	-942
...						

All of the ten Norwegian CDDA sites are located in Svalbard. The spatial data shows no larger differences. The reason for the high differences in size area could be an improvement of the reported sites area for the CDDA delivery in 2018.

7.2 The type 1 (spatial) delivery

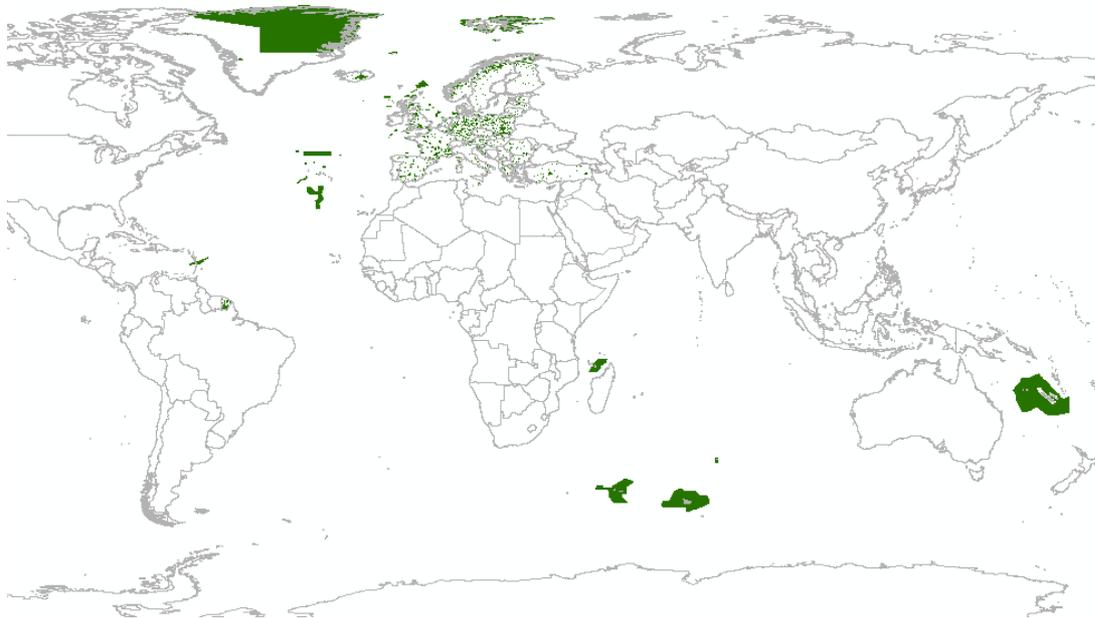
Spatial data (ProtectedSite / type1) delivered in form of points and polygons:

Table 7-5 Type 1 – count of points and polygons

Dataset	Total number of sites
ProtectedSite (Type 1) - Polygons	106559
ProtectedSite (Type 1) - Points	4001
ProtectedSite (Type 1) - Points & Polygons	110560

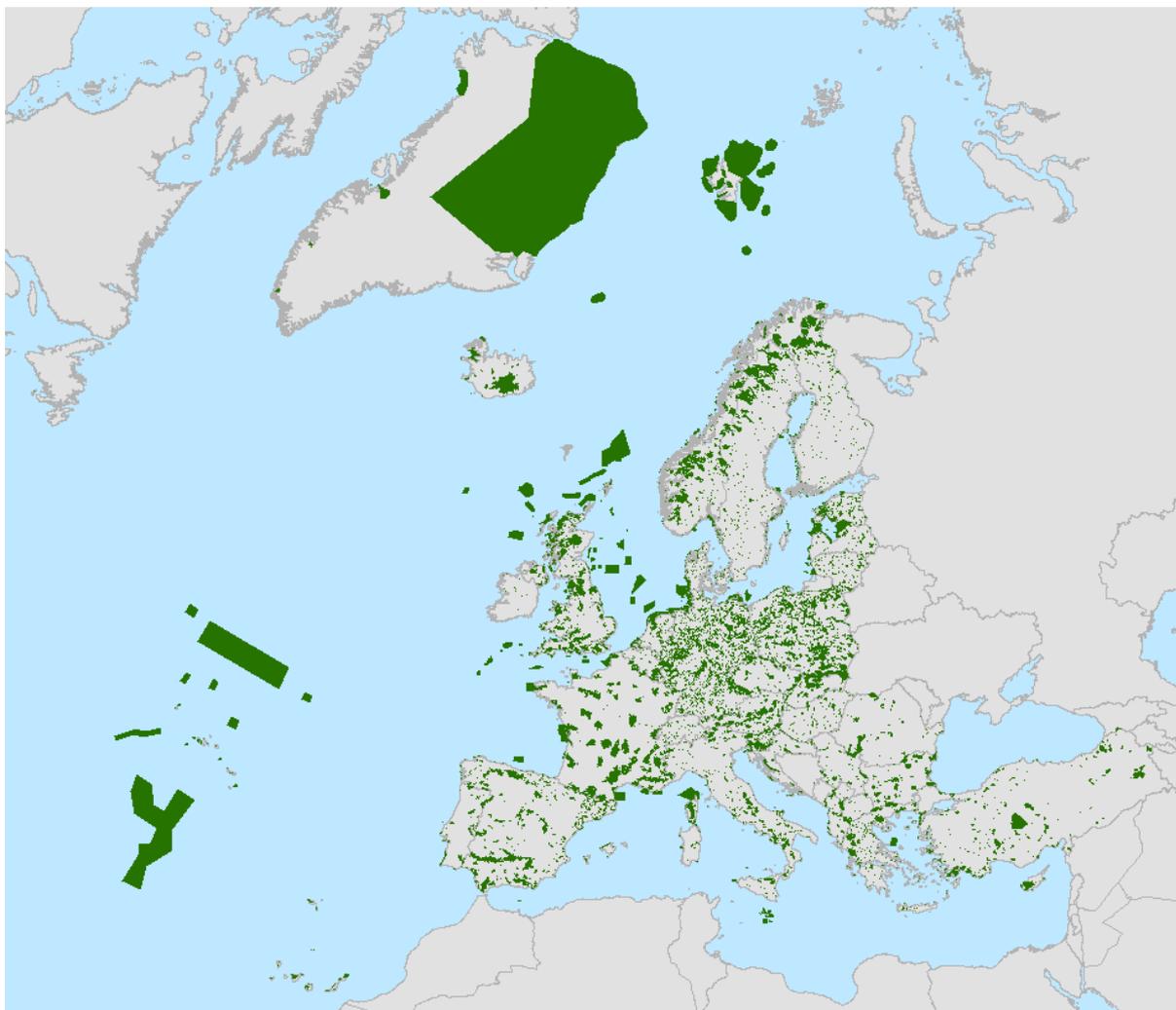
The following map shows the full CDDA dataset with all delivered sites:

Map 7-3 CDDA v16 with all polygon sites (also sites from overseas territories) in WGS84

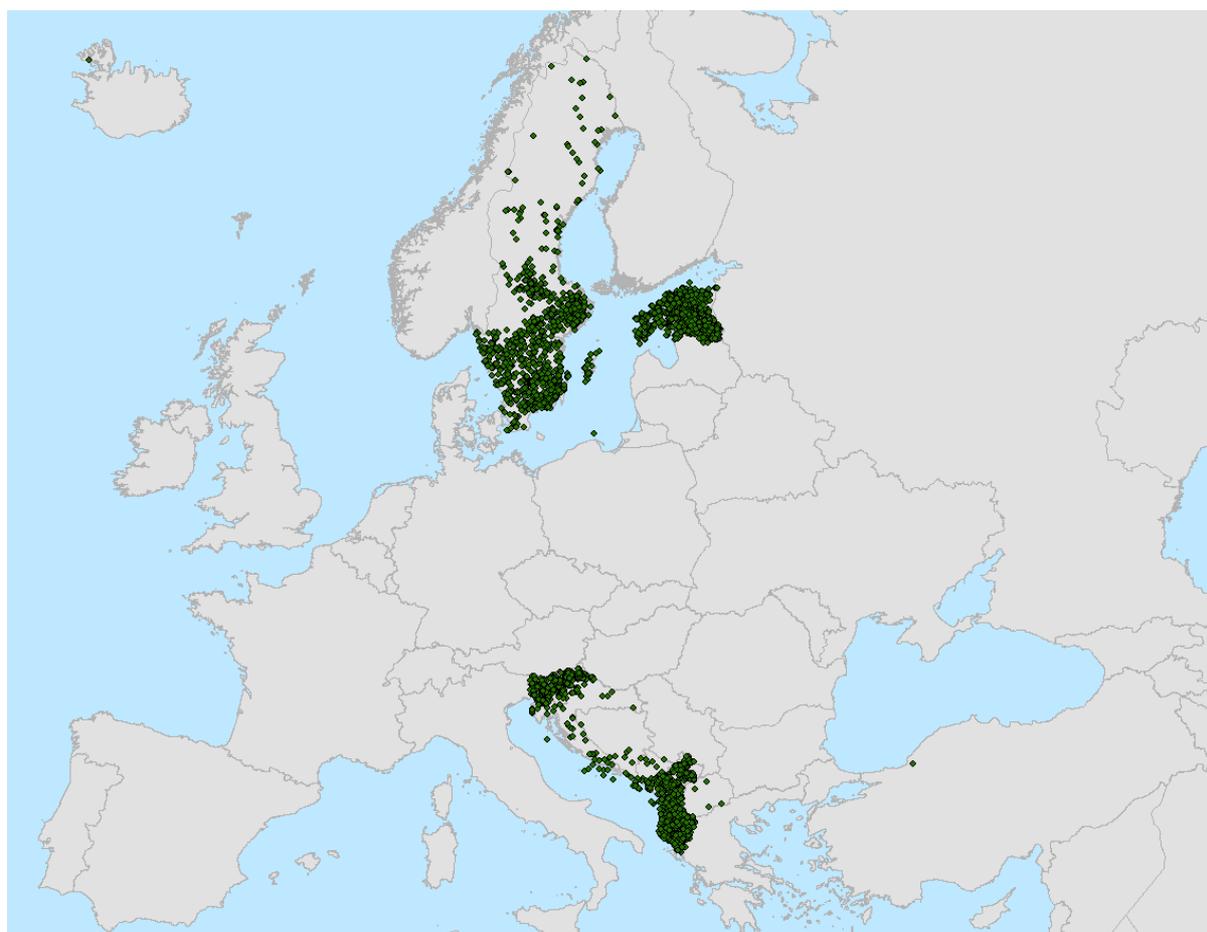


To get a better impression of the sites located on the European continent, the following maps with CDDA sites in LAEA projection can be used:

Map 7-4 European polygon sites in LAEA projection



Map 7-5 European sites (points) in LAEA projection



7.3 Information on major ecosystem types

One important CDDA information is the “Major ecosystem type” - <http://dd.eionet.europa.eu/dataelements/69878>. For every CDDA site the major ecosystem type: marine, marine-terrestrial or terrestrial should be specified.

The following table shows the count of CDDA sites classified by the major ecosystem type for the different countries:

Table 7-6 Distribution of count of CDDA sites per major ecosystem

Country	Country	Terrestrial	Marine-terrestrial	Marine	no value	Info
Albania	AL	797	1	1	0	
Austria	AT	1159	0	0	0	no new data
Bosnia Herzegovina	BA	0	0	0	46	no new data
Belgium	BE	1428	15	2	0	
Bulgaria	BG	1014	3	1	0	
Switzerland	CH	6832	0	0	0	
Cyprus	CY	57	0	2	0	no new data
Czech Republic	CZ	2663	0	0	0	
Germany	DE	17553	87	6	0	
Denmark	DK	1923	6	0	0	
Estonia	EE	15344	281	28	0	
Greece	EL	760	40	3	0	
Spain	ES	1674	88	21	0	
Finland	FI	12469	822	9	0	
France	FR	3066	48	39	0	
Croatia	HR	386	20	2	0	
Hungary	HU	308	0	0	0	
Ireland	IE	261	45	3	0	
Iceland	IS	113	0	0	0	
Italy	IT	833	5	33	0	
Liechtenstein	LI	0	0	0	41	no new data
Lithuania	LT	473	2	4	0	no new data
Luxembourg	LU	125	0	0	0	
Latvia	LV	668	2	7	0	
Montenegro	ME	52	0	0	0	
Macedonia,	MK	79	0	0	0	
Malta	MT	241	0	17	0	
Netherlands	NL	170	3	7	0	no new data
Norway	NO	2166	861	6	0	
Poland	PL	2030	16	0	0	
Portugal	PT	166	17	46	0	
Romania	RO	943	0	1	0	
Serbia	RS	368	0	0	0	
Sweden	SE	14502	793	1	0	
Slovenia	SI	2019	15	6	0	
Slovakia	SK	1191	0	0	0	
Turkey	TR	1247	5	0	2404	no new data
United Kingdom	UK	9011	267	109	0	
Kosovo	XK	171	0	0	0	
TOTAL EEA39	EEA39	104262	3442	354	2491	

Only in three countries sites without major ecosystem values can be found. In all other countries the information about the ecosystem is available for all sites.

7.4 Information on IUCN categories

Another important CDDA information is the IUCN management category of the protected site <http://dd.eionet.europa.eu/dataelements/74678>.

The following table shows the count of sites classified by their IUCN category.

Table 7-7 Distribution of sites by IUCN category and country

Country	Ia	Ib	II	III	IV	V	VI	not Applicable	not Assigned	not Reported	info
Albania	2	0	15	748	25	5	4	0	0	0	
Austria	0	0	9	145	657	344	3	1	0	0	no new data
Belgium	0	0	0	0	1041	11	23	370	0	0	
Bulgaria	55	0	3	349	35	11	565	0	0	0	
Bosnia - Herzegovina	0	0	0	2	0	1	0	0	0	43	no new data
Switzerland	553	0	0	0	6231	0	0	0	48	0	
Cyprus	11	0	11	6	24	2	5	0	0	0	no new data
Czech Republic	15	3	3	648	1928	33	0	0	0	33	
Germany	0	0	16	2	8283	8714	0	0	631	0	
Denmark	6	14	10	23	301	1425	0	150	0	0	
Spain	13	61	97	271	185	315	43	0	798	0	
Estonia	29	1342	0	1090	997	875	862	10458	0	0	
Finland	22	323	46	17	9877	703	0	0	2312	0	
France	55	1	7	14	3001	73	0	0	2	0	
United Kingdom	0	0	19	343	8633	93	0	43	70	186	
Greece	10	0	26	29	623	5	73	37	0	0	
Croatia	0	0	0	0	0	0	0	0	0	408	
Hungary	0	0	5	88	157	57	0	1	0	0	
Ireland	73	0	6	0	230	0	0	0	0	0	
Iceland	2	2	5	43	19	29	13	0	0	0	
Italy	116	0	24	55	491	185	0	0	0	0	no new data
Liechtenstein	0	9	0	0	31	1	0	0	0	0	no new data
Lithuania	6	0	5	0	404	32	32	0	0	0	
Luxembourg	0	55	3	0	67	0	0	0	0	0	
Latvia	0	4	45	325	293	10	0	0	0	0	
FYROM	2	0	3	60	12	1	1	0	0	0	
Malta	3	0	1	6	212	13	1	22	0	0	
Montenegro	1	0	5	41	0	5	0	0	0	0	no new data
Netherlands	0	0	20	0	160	0	0	0	0	0	
Norway	2288	1	46	110	271	134	0	0	0	183	
Poland	0	0	16	0	1432	120	0	0	478	0	
Portugal	13	25	1	22	68	47	53	0	0	0	
Romania	45	0	13	203	667	16	0	0	0	0	
Serbia	8	1	3	179	34	23	2	0	0	118	
Slovakia	336	23	2	331	403	21	0	75	0	0	
Slovenia	6	51	1	1162	0	43	0	777	0	0	
Sweden	3370	161	23	306	1328	305	0	7372	2431	0	
Turkey	1576	6	41	0	80	194	1650	109	0	0	no new data
Kosovo	18	1	2	155	0	6	0	0	0	0	

Box 7-1 IUCN categories

INFO: IUCN categories

- Category Ia – Strict Nature Reserve
- Category Ib – Wilderness Area
- Category II – National Park
- Category III – Natural Monument or Feature
- Category IV – Habitat/Species Management Area
- Category V – Protected Landscape/Seascape
- Category VI – Protected Area with sustainable use of natural resources
- notApplicable - The IUCN management categories are not applicable to a specific designation type
- notAssigned - A protected area whereby the data provider has chosen not to use the IUCN management categories.
- notReported - The IUCN management category has not been reported.

In 16 countries all sites are classified into the IUCN categories. All other countries have values for “notApplicable”, “notAssigned” and “notReported”.

7.5 Information on “*designation_boundaries*”

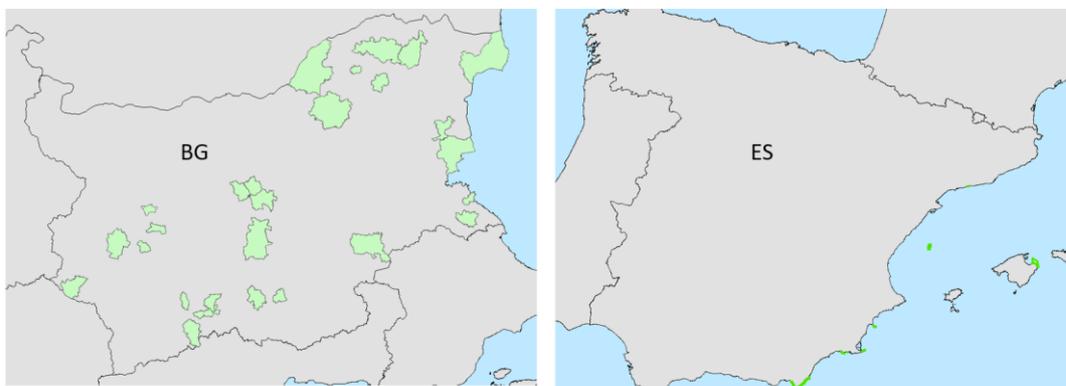
The designation boundaries concept is used for the reporting of areas protected by a designation type which does not create individual sites that can be identified by a site code. Designation boundaries are always reported as a spatial dataset

<http://dd.eionet.europa.eu/tables/9117>

In the previous CDDA version the three countries Italy, Serbia and Netherlands delivered “*designation_boundaries*”. For the recent reporting the countries Bulgaria and Spain provided “*designation_boundaries*”. The reason for not supplying designation boundaries from the countries Serbia, Italy and the Netherlands is not known to EEA.

The following map shows the delivered designation boundaries from Bulgaria and Spain. In Bulgaria the sites are located all over the country, in Spain on the Mediterranean coast.

Map 7-6 Designation boundaries maps for Bulgaria and Spain



8 Concluding remarks

In this chapter, the essential notes on the entire CDDA process are presented once again. For the detailed issues see the chapter before.

8.1 *General feedback*

Throughout the CDDA reporting process general observations and issue have been found which are explained below:

- One of the main improvements is a significant increase in actual spatial representations of protected areas as all areas reported must be described by geometries next to the type 2 tabular data.
- Spatial resolution of many national deliveries has significantly improved
- Most countries did not raise systematic questions related to the new workflow. Nonetheless the steps to be performed and the preparation of data are not clear to all countries yet
→ lots of corrections carried out by ETC/BD in the past; new workflow requires countries to perform these corrections and improvements themselves
- A revision of the description should be considered as not all countries could follow the required steps:
 - Handling of protected areas for which no spatial representations (geometries) are available in the country (yet)
 - Filling the linkedDataset sheet
- By the new workflow wherein countries report their data into the CDR and receive a direct feedback through the automatic QC, which covers a lot of semantic points, the number of minor and major problems to be solved later on is reduced. The CDDA Helpdesk offers to countries a contact interface to get assistance for issues they have while generating the data to be reported and the first QC phase. This increases the understanding of the reporting process to some point as the countries have to investigate and understand their issues to some point and actively contact the Helpdesk. Previously, ETC acting as Helpdesk had to contact the countries to clarify issues. Through the new workflow which blocks a release of the reporting until it is fit for further processing, the countries have taken on more responsibility.
- The new reporting workflow restricts the Helpdesk or ETC/BD to manipulate data directly in order to correct errors or solve issues. In all stages of the process, the countries have to carry out the correction or improvement work after instruction from the Helpdesk. This has some disadvantages compared to the previous reporting process:
 - The whole assistance is based on written instructions and answers which may be more complicated and time consuming than the actual correction. The Helpdesk does not know how far the responsible party in the country can follow the issue and solution and what knowledge is available for the data processing. As a consequence, the instructions must suit all potential levels of knowledge on the country side.
 - Solution of issues and improvement of data quality very much relies on the activity of the country reporter. Reaction time in many cases was quite long

with some questions never answered. If there is no answer or only very limited resources on the country side available for further correction, the data might not reach the required quality to pass the QA.

- Some countries tend to ask for assistance instead of trying to solve issues on their own.
- In comparison with the previous reporting, the main impression is that countries were able to deal better with the more predefined and much more restricted way of reporting assisted by the technical guidance in the CDR (conversion, automatic QA) as well as the Helpdesk providing human feedback and detailed help. As the data reporting is much more structured by specifications in the new guidelines and channelized through automatic and manual checks, the data at the end of the reporting process appears to be of higher quality.

8.2 *Technical feedback*

- Country borders including a buffer around coastlines and taking the EEZ into account are needed
- Definition of fully terrestrial/marine site can still include small fractions of other ecosystem. See e.g. Norway where up to 5% of the other ecosystem are still accepted in one ecosystem until it's defined as marine-terrestrial. Should be discussed: either the marineAreaPercentage has to be NULL/100 as soon as a protected area is purely terrestrial or marine or if the information on the percentage of the small fraction should also be accepted.
- Handling for countries already applying a country-internal data harvesting
 - Conversion of data to CDDA requirements
 - Data specification comparison/adjustment with INSPIRE PS → still differences? and if so how to solve
- No fixed agreement how to deal with 'non-blocking errors' (are there still supposed to be non-blocking ERROR messages in 2019?)
- Error/warning/blocker messages could in some cases explain the reason for the raised message a bit more in detail → really error specific so it's obvious that it is impossible to cover all cases. Maybe revision of the potential messages with the ETC/Helpdesk could help to improve the messages itself based on the country feedback and reaction